ENCYCLOPEDIA OF
Nineteenth-Century Photography

VOLUME 1
A–I
INDEX

John Hannavy
EDITOR

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Introduction

The *Encyclopedia of Nineteenth-Century Photography* is a unique publication, one that is an essential reference work for anyone interested in the medium of photography. This text is the result of diligent primary research by many of the world's leading researchers and writers on the subject. Their scholarship has revealed many long established 'facts' to be fictions, established the role of many hitherto unrecorded figures, measured the achievements of many of the leading practitioners against contemporary critical appraisal of their work, and placed the history of photography's first century within a social and economic context. What these researches have produced is a reference work of significant scholarship that in addition to standing as a critical work of reference, offers many highly perceptive essays that significantly develop current critical debate on the role, the nature, and the merits of nineteenth century photography.

We have devoted considerable space to key figures like Daguerre, Talbot, Fenton, Herschel, Brady and others to place their achievements in context. Similarly, major inventors, manufacturers, organisations, and supporters of the medium have been examined in extended essays. In its totality the encyclopedia contains1197 entries: 610 major entries of 1000 to 5000 words, and an additional 587 shorter entries on minor and emerging figures; together these provide readers an expansive history of nineteenth century photography. This text ranges from shorter 200 word entries that provide snapshots of photographic figures and other key elements of nineteenth century photography to large, 5,000 word entries that provide detailed, analytical scholarship for our readers.

The encyclopedia offers a number of access points to information. Photography's history can be explored by date, by named image-maker, by area, or by process to name but four, with each of these themes offering a fresh perspective on the history of the medium.

How to Use This Book

The *Encyclopedia of Nineteenth-Century Photography* contains **both alphabetical and thematic tables of contents** for easy reference. These sections allow researchers to quickly and easily locate topics of interest or a group of similar entries under a specific theme. **See Also**s at the end of many entries provide cross-references to guide the reader to associated entries. Readers also have the pleasure of viewing the **197 images** placed throughout this work to aid their understanding of nineteenth-century photography. Included as well with every major entry is a **Further Reading** section in which authors have listed referenced texts or other works giving additional content on that topic. A thorough, analytical **index** increases the ease of navigating these two volumes.

National and Regional Surveys allow readers geographically oriented access, enabling them to learn about location-specific issues—from the overly humid conditions of South Asia to the arid environment of Egypt. These sections provide a fresh framework by which to read, separating true history from the conventional western-oriented understanding of history that has dominated photographic historiography for a century.

Societies, Groups, Institutions, and Exhibitions offer a unique view of the popularisation of photography and its encouragement by local and national groups and organisations, and show how exhibitions were used to draw together photographers from other countries. In these entries short- and long-term interest groups and exhibitions are discussed from conception to either their conclusion or present day. These discussions often include the photographers and patrons who were critically involved in the success of these groups and of photography in the nineteenth century. Readers will see a global interconnectedness emerge from these entries as the histories of these groups are revealed.

Publications looks at both illustration- and word-based texts. Word-based publications often focus primarily on the art and science of photography itself. Necessary to a comprehensive understanding of the appeal of photography in the nineteenth century is that illustration-based publications provided not just images of foreign lands to people who could not afford to travel, but they created images for discussion, research, and further review as well. The emergence of the photographic press served not only as a means of disseminating information for the practical application of photography but also for its chemistry, techniques, processes, and equipment. The photographic press also functioned as a platform for the publication of criticism and debate. Through these increasingly widely-read journals, problems concerning the manipulation of early processes were often resolved through readers' letter pages.

Photographers, Inventors, Patrons, and Critics, the most conventional of the texts' themes, offer the reader extended biographies of leading names in the development of the art and science of photography. The figures located under this section have often contributed critically to the success and proliferation of photography internationally; however, this section includes minor figures as well whose involvement were nonetheless important in the development of photography.

Although there is both an alpha and thematic table of contents, the entries are sequenced alphabetically, ensuring that the information contained in these volumes can be accessed easily by the reader. This encyclopedia offers a total overview of the history of photography's first century. Many of the earliest encyclopedias served as compilations of photographic history and practice for the benefit of the working photographer in pre-Great War Britain and America, however this encyclopedia is a comprehensive reference work on photography's first century for the benefit of a growing body of not just photographic historians, academics, professionals, and enthusiasts worldwide but students as well. Primary amongst our requisites for this encyclopedia was that it be the reference work we would want students and upcoming scholars to use in researching photographic history.

A century ago photographic history was the pursuit just a few. Very few eminent photographers of the day were interested in the work of their antecedents, a notable example being Alvin Langdon Coburn, , who was fascinated by the work of early Scottish photographers David Octavius Hill and Robert Adamson, and the Scottish amateur Dr Thomas Keith. Today however a much wider body of people—including photographic historians, nonspecialists, and students—seek to develop a deeper understanding of photography's history to place it within the wider context that this encyclopedia provides.

Readers can also explore the history of the companies, devices and techniques that were invented, developed, and marketed by individuals and companies such as Bausch & Lomb, R & J Beck, Jonathan Fallowfield, Kodak, J Lancaster, Marion & Co, Ross, Voigtlander, and Alfred Watkins all of which are discussed in detail in the entries that follow. The breadth of this encyclopedia's list of entries reaches not just the science or art of photography, but also the practicality of it. For instance, between the announcement of the daguerreotype and the end of the nineteenth century, the weight of a camera had been reduced from more than one hundred pounds to just a few pounds, and the total equipment a photographer needed to carry on location had been reduced from enough to fill a small carriage to less than would fill a small knapsack. These entries narrate the progression and evolution of photography for the historian, constructing a dynamic, fundamental understanding of photography starting from kitchen-sink chemistry where each photographer was exclusively responsible for the manufacture of his or her sensitive materials, to the beginning of mass manufacturing towards the end of the century. These discussions highlight the emergence of companies like Kodak and Agfa, which were already firmly established in the industry as the nineteenth century drew to a close and which would later dominate the twentieth century.

It has often been said that at the time of the introduction of the first viable photographic processes, photography was a solution in search of a problem. Although the inventors of the medium were confident in their predictions of the huge potential of photography, none could have foreseen the range of applications, and the innumerable approaches and styles that would emerge before the end of the nineteenth century. Nor could anyone have foreseen the number of processes that would be introduced, or predict the success of some and the failure of others. Those applications, approaches, styles, and processes, minor as well as major, are explored and discussed within the pages that follow, as are their photographic inventors, supporters, and exponents. This comprehensive text provides researchers with this material in an easy-to-navigate, meticulously organized reference work.

This *Encyclopedia of Nineteenth-Century Photography* encompasses the enormous range and depth of nineteenth century photography, both art and science. There are many entries on major and minor figures whose achievements have previously been under-reported, providing readers with a much fuller history than was available hitherto. This is the first comprehensive reference work to introduce and celebrate these obscure,

misremembered photographers, and clarify enduring confusion over names. For example there were three photographers operating under the name William Bell, all of whom were in the forefront of nineteenth century American photography. Our contributors have clearly identified all three and separated their achievements. Similar diligence has been applied all the entries to ensure the histories included herein are thoughtful, useful, and clear, and that they establish an accurate nineteenth century photographic history.

Photography's first century is one of invention and innovation, intense debate and the development of an increasingly sophisticated visual language. The academic study of photographic history is a surprisingly young subject, despite the fact that over a century and a half has passed since its first published history. It is one of photographic history's failings that some of the misinterpretations that are bound to be present in any early attempt to document a history have remained unchallenged for so long. That many such misunderstandings have been replicated from one book to another, and are now repeated on countless websites, underlines the importance of a publication as exhaustive as the *Encyclopedia of Nineteenth-Century Photography*. This text contains explorations and discussions by leading theorists, historians, and critics of the innovations, and the debates and implications of photography in the nineteenth century. These contributors have painstakingly researched these topics to simplify and delineate these issues for our readers. The commissioning of leading experts to research and compile this encyclopedia, with many of them offering fresh and often challenging readings of the subject, has made this text essential reading.

As mentioned earlier, one of the strengths of this encyclopedia is the inclusion of many figures whose contribution to the development of the medium have been unacknowledged, but yet another is the commitment of the writers to return to primary source material and review many of the assumptions and misconceptions in the history of the subject. Because of this return to primary material several of the 'facts' published in many past works have been revealed as misunderstandings based on only partial information. An example is the discovery of hand-written patents in the Scottish and Irish Patents Offices, negating the widely published assertion that Richard Beard did not patent the daguerreotype in either country, which scholars have often cited as an explanation for why there were in the 1840s more daguerreotypists in Scotland than in England. That he patented the process throughout Great Britain, but apparently did not enforce his patent rights except in England and Wales, opened up new understanding and interpretation of his career included in his entry in this text.

Furthermore, the encylopedia's scope encompasses more than just American, Great Britain, and France to include countries not often thoroughly discussed in photo-historical texts. The history of photography contained in this encyclopedia is the product of a photo- instead of Anglo- or Euro-centric approach, and one that encompasses extended accounts of the emergence of photography in many areas of the world including Russia, China, Japan, Central and South America, Africa, and the Ottoman Empire and also offers biographies of leading figures in each of these areas. These countries and regions have been covered in depth to establish a history of photography's expansive influence upon, and importance in, cultures throughout the world. Researchers using this text will read entries by authorities based in the countries about which they are writing, introducing them to many photographers whose work will now be recognized to be as important as some of the image-makers whose place in the pantheon of photographic history is already established.

Although photography existed in its own right worldwide, photography's inventors were predominantly from France, Britain, and America, and as such, these nations were primarily responsible for the dissemination of the medium. British and French travellers and military personnel played a pivotal role in taking photography to Asia, Africa, and the Antipodes, with American photographers taking the medium to South America and the Pacific.

These travellers introduced photography to the first generation of indigenous practitioners in each country, many of whose achievements are published within this text for the first time. As local photographers matured in their understanding of the medium, and developed their own locally relevant aesthetic—often drawn from national trends and styles in painting the exhibitions they organised, and the societies and groups they established, developed their own national momentum. Essays mapping the emergence of these exhibitions, institutions, and organisations are crucial in establishing the contexts within which the first and second generations of photographers operated.

The diversity of perspectives provided for readers includes the exploration of the role played by major and minor figures in the emergence of historical and critical writing on photography, from Henry Snelling to Helmut Gernsheim. Documented as well are accounts of pioneering advocates of the medium who understood the importance of the photograph as historical artefact. Key amongst those advocates are the early collectors, whose understanding of the importance of collecting visual material then ensured that the available evidence of photography's history would be as rich as it is today. Thus readers will find entries for those who established the collection at the South Kensington Museum, now

the Victoria & Albert Museum—and those who initiated the collecting of photographs at the Library of Congress and elsewhere.

Our enduring impressions of the nineteenth century including the Crimean War, the American Civil War, and other mid-century conflicts are informed by the images offered by surviving photographs. These images were often constrained by the limitations of available processes and technology, by the photographers' interpretation of contemporary sensibilities and by the photographers' recognition that sales of the resulting images had to conform to the tastes of the purchaser. When with an understanding of their time, however, these images serve as valid historical documentation from which anyone reading this text can gain not only a more intimate knowledge of these events, but also of how responsive photography was in certain circumstances.

Just as influential in dictating the nature and content of photographs of news and current affairs were the constraints placed on mid-nineteenth century photographers by the nature of the processes they were using. The inability of the medium to capture action resulted in an abundance of staged portraits. Thus, in offering a real understanding of the images produced during the nineteenth century, we have sought in compiling *The Encyclopedia of Nineteenth-Century Photography* to present factual material within its contemporary nineteenth century context. Reading mid-Victorian images with a twenty-first century mindset is to misunderstand much of what is to be seen.

The publication of both the *Encyclopedia of Nineteenth-Century Photography* and the companion three-volume *Encyclopedia of Twentieth-Century Photography*, document the magnitude of nineteenth century photographers' vision, and the extent to which their early predictions for photography have been achieved and surpassed. These two texts present in a set of reference books what will become the standard sources of students for years to come. These volumes will also by their breadth and content undoubtedly drive further photo-historical research in many of those areas of study.

Acknowledgments

In bringing this project to completion, I am indebted to the vision of the original editor, Pamela Roberts, and to the Advisory Board made up of leading academics and curators worldwide, who established the basic principles of the project and drew up the original list of entries. I have deviated only slightly from their list, adding a few emerging figures as the project progressed. To realise their vision required the scholarship of the many leading authorities on nineteenth century photography who have written the entries, and the many collections from which the illustrations have generously been made available.

The contributions of many people have been equally crucial in completing this project and we owe them each, individually, a debt of gratitude for their perseverance. To name but a few, I am especially indebted to Ron Callender, Alistair Crawford, Malcolm Daniel, Anthony Hamber, Michael Hallett, Colin Harding, Kathleen Stewart Howe, Gael Newton, Michael Pritchard, Pam Roberts, Larry Schaaf, Graham Smith, and Mike Ware for their knowledge and their advice, and for their generosity with their time in helping me unravel some of the complexities of identification, and helping me to find authoritative writers for many of the more challenging entries that have significantly expanded the boundaries of published knowledge. That we have found accomplished researchers adds to the integrity of the project. Special thanks to Mark Georgiev, Acquisitions Editor, and also to Beth Renner, Development Editor at Routledge, who has had the unenviable task of keeping track of all the assignments, cajoling writers who missed their deadlines, liaising with me every step along the way, and helping us get back on track needed.

Despite its trials, this has been one of the most rewarding projects with which I have been involved. During it, I have had the pleasure of meeting and discussing photographic history with countless remarkable people. The highs have been very high, but the lows would have been a lot lower without the support and encouragement of my wife, Kath.

JOHN HANNAVY

A

ABBE, ERNST (1840–1905)

German-born Ernst Abbe was one of the pioneers in optical physics. In 1866, while a Professor at the University of Jena, he met Carl Zeiss, later becoming Director of Research at the Zeiss Optical Works in Jena.

Abbe and Zeiss later became partners (1875), and were responsible for the development of many innovative optical systems for the microscope, and for developments in optical design which were far-reaching—none more so than the development, with Otto Schott, of the world's first apochromatic lenses (1886), the first to eliminate chromatic aberration.

Abbe's command of optical theory was a significant factor in the establishment of the worldwide reputation of Zeiss optics, as all his lens designs were based on precise, and theoretically sound calculations. Together with Otto Schott, who he met in 1881, Abbe played a significant role in the evolution of new formulations for the manufacture of optical-quality glass.

One of Abbe's many significant contributions to the understanding of how lenses worked was his system of 'Abbe numbers' which gave a numeric value to the extent to which glass disperses light of different wavelengths. These figures varied from around 25 for flint glass, to over 60 for crown glass—the lower the number, the greater the loss of quality due to refractive dispersion.

JOHN HANNAVY

ABDULLAH FRÈRES
Vhichen (1820–1902), Kevork (1839–1918). and Hovsep (1830–1908)

Vichen Abdullah was an Ottoman Armenian who began his photographic career touching up photographs at the studio opened by Rabach in Istanbul in 1856. When his brother Kevork returned from studying at the Murad-Raphaelyan School in Venice in 1858, together with a third brother, Hovsep, they took over Rabach's studio, which became known as Abdullah Fréres.

The brothers became official royal photographers after taking a portrait of Sultan Abdülaziz (1830–1876) in 1863.

They took portrait photographs of Edward, Prince of Wales, who visited Istanbul in 1869, and Empress Eugénie (1826–1920) of France.

The Abdullah brothers were masters at both studio and outdoor photography.

When the Ottomans were defeated in the Ottoman-Russian War of 1877–1878, the Russian army made its headquarters at San Stefano near Istanbul on 26 February 1878. Grand Duke Nicholas (1831–1891) commissioned Kevork Abdullah to take a group photograph of 107 people. Angered by this, Sultan Abdülhamid II prohibited the brothers from using the royal monogram and keeping the portraits of the sultan they had taken.

In 1866, at the invitation of the Khedive of Egypt, Tevfik Pasha, Kevork, and Hovsep opened a branch studio in Cairo.

In 1890 Sultan Abdülhamid II restored the right of the Abdullah brothers to use the royal monogram, and the studio flourished once again.

In 1895 the brothers closed down the Cairo studio, and at the end of 1900 they sold the Istanbul studio to Sébah and Joaillier.

ENGIN ÖZENDES

ABNEY, WILLIAM DE WIVELESLIE (1843–1920)

English photographic scientist

Abney was born in Derby, England on July 24, 1843, the eldest son of the Rev. Edward Henry Abney and Catherina Abney (formerly Strutt). His father was the vicar of

St Alkmands, Derby (later the prebendary of Lichfield). Through his mother, Abney was the great great grandson of Jedediah Strutt, a partner of Richard Arkwright, inventor of the waterframe spinning machine.

Abney was educated at Rossell school and then the Royal Military Academy, Woolwich. He was commissioned as a Lieutenant in the Royal Engineers in 1861 and served in India until invalided home in 1867. As photography's practical applications became of increasing value to the army, Abney was encouraged to develop his boyhood interest in the subject, which had become a serious study as early as1862. In 1871 he was appointed Assistant Instructor in Telegraphy at the School of Military Engineering at Chatham but within a year was transferred to a similar post with sole responsibility for chemistry and photography. Abney produced a small pamphlet, *Instruction in Photography,* as an aid in his classes. This was later to become the basis of an invaluable guide for innumerable students of the art beyond the army. In 1873 he developed the papyrotype photolithographic process and was promoted to Captain in the same year. In 1874 Abney was selected to organise the photographic observation of the transit of Venus in Egypt. His book, *Thebes and its Five Great Temples* (1876), was written following this trip. Abney left Chatham in 1877 to become a Civil Servant in the Department of Science and Art. However, he was not formally retired from the army until 1881 and continued to be known as Captain Abney until he was Knighted in 1900.

On joining the Department of Science and Art in 1877, Abney became an Inspector of Schools and soon became a respected figure. He was promoted to Assistant Director for Science in 1884 and Director for Science in 1893. One of his major tasks was the organisation of grants for the establishment of school laboratories. He was convinced that practical instruction in the sciences was a vital component of a modern education. He later claimed that this period was largely "missionary work" for science Abney retired in 1903, following changes brought about by Balfour's Education Act.

During his time as a Civil Servant, Abney was based at the South Kensington Museum in one of the of the metal buildings know to Londoners as the "Brompton Boilers." It was from his laboratory here that he undertook most of the scientific and photographic work for which he is remembered. He made important investigations into the alkaline development of photographic images in 1877 and in 1880 he introduced hydroquinine as a developing agent. More significant was his work on the improvement of photographic emulsions along with the development of printing processes and of photographic printing paper. With Charles Bennett and D.B.van Monkhoven, he was largely responsible for the widespread introduction to England of the rapid gelatin emulsions that made so called 'instantaneous' photography possible. In 1881 Abney introduced the gelatino-citrochloride emulsion printing process that later became the basis of POP (Printing Out Paper), an immensely popular product in the growing amateur market. Abney also found time to publish *Emulsion Processes in Photography* (1878), later retitled *Photography with Emulsions* and the popular *Treatise on Photography* (1878) which reached its tenth edition in 1905.

Other investigations included tests on the speed and efficiency of shutters and probably the first quantitative density measurements of a photographic image. This latter work was to lead him to question the accuracy of the experiments of Hurter and Driffield. As Editor of the *Photographic Journal* however, he considered their investigations important enough to be published and was content for the matter to be judged by his peers. Abney also undertook work in colour analysis and colour vision, which naturally led to an interest in colour photography. In 1905, he introduced a tricolour system of colour photography, which employed three separate lenses and colour separation positives. Abney later published *Trichromatic Theory of Colour* (1914) which was based on his original research.

Abney's achievements in science extended beyond photography. His work on emulsions led him to produce a photographic emulsion sensitive to the infrared region of the electromagnetic spectrum. This allowed him to record the infrared spectrum of the sun. More importantly, with Robert Festing, he studied the absorption spectra of chemical compounds, work that was to play a key role in the development of spectroscopy. He made numerous contributions to other sciences and was elected a Fellow of the Royal Society in 1876.

Abney's interests in the aesthetics of photography were overshadowed by his contribution to its science. Nevertheless, he did not ignore the artistic aspects of the subject as is evident from his publications. He was a keen traveller and produced many fine photographic views both in England and in the Swiss and Italian Alps. Abney was also a competent watercolorist.

Abney held prominent positions in several scientific societies and served as President of the Royal Photographic Society in 1892–94, 1896, and 1903–1905. He published over twenty books and innumerable articles and papers. He promoted a national collection of photographic history at South Kensington, which later became the Science Museum Photography Collection, the forerunner of the National Media Museum at Bradford.

Abney was a taciturn but charming man who despised snobbery in any form. He married Agnes Mathilda, daughter of Edward William Smith of Tickton Hall in Yorkshire in 1864. They had one son and two daughters. Following Agnes's death in 1888, he married Mary Louisa, daughter of Rev. Eward Nathaniel Mead of East

Barnet, Hertfordshire. The second marriage produced one daughter. For many years, Abney lived in South Bolton Gardens, close to his South Kensington laboratory, but moved to Folkstone in 1920 because of failing health. He died there of bronchitis and kidney failure on December 2, 1920.

JOHN WARD

Biography

William de Wiveleslie Abney was born on July 24, 1843 in Derby, England. He was given a scientific education at the Royal Military Academy in Woolwich. The army also encouraged him to develop a boyhood hobby of photography and he later instructed officers and men in the subject. Abney became a Civil Servant in 1877 and from his laboratory at the back of the South Kensington Museum undertook most of the work for which he is remembered today. He undertook significant researches into the nature of gelatin silver halide emulsions at a time when they were being widely adopted by photographers. His most important practical innovations were the introduction of hydroquinone as a developing agent in 1880 and silver gelatin citrochloride emulsions for printing-out paper (POP) in 1881. However, Abney was at the forefront of many aspects of photographic research during a period of great innovation in photography. He devised new techniques of photomechanical printing and conducted significant researches in the fields of colour photography, photochemistry and spectral analysis. Abney published prolifically throughout his career. He was instrumental in establishing what became the Science Museum Photography Collection, now at the National Museum of Photography Film and Television at Bradford. Artefacts relating to Abney are preserved at Bradford and in the Science Museum, London. Abney died in Folkstone on December 2, 1920.

See also: Emulsions; and Hurter, Ferdinand, and Driffield, Vero Charles.

Further Reading

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ACKLAND, WILLIAM (1821–1895)

English optician and photographer

William Ackland was connected for nearly forty years with the firm of Horne and Thornthwaite up to his death. He directed the optical works of the firm and in later years gave much attention to equatorial stands and reflecting telescopes.

Ackland was the author of several pamphlets on photographic matters including *How to take stereoscopic pictures* (1857) and *Hint's on Fothergill's Process* (1858) which were all published by Horne and Thornthwaite. He also wrote on the collodion process on glass in 1857 in Horne and Thornthwaite's catalogue. As part of his wider involvement in optics he wrote *Hints on Spectacles. When to wear and how to select them* (1866).

Dr Ackland became a member of the Photographic Society in 1869 and was for many years a member of the Society's Council. Shortly before his death he was made an Honorary Fellow. From 1856 he wrote several articles for the *Journal of the Photographic Society* mainly on different processes and was an active participant in the Society's meetings. He was a Fellow of the Institute of Chemistry.

His interest in photographic matters continued throughout his life and he designed a Photographic Exposure Scale, a form of exposure calculator, in 1888. He applied for a patent for this in 1891 under the title 'Registering Photographic Expsoures' (British patent number 12409) which was subsequently abandoned.

Ackland died in Brixton aged 74 on 30 March 1895.

MICHAEL PRITCHARD

ACRES, BIRT (1854–1918)

American photographer

Born in the U.S. to British parents, 23 July 1854. Trained in art and science in Paris and was a frontiersman on the North American plains. Moved to Britain in the early 1880s. In 1888 Acres lectured on the use of isochromatic (color sensitive) plates for correct representation of tones, projecting his own examples to acclaim. His slide subjects included European cathedrals, boats, and the sea. Married Annie Elizabeth Cash, 1891. Working as a photographer, he eventually became manager of

Elliott & Son, photographic plate manufacturers in Brent, north London. Long interested in representing motion by photography, in 1893 he patented a slide changer for projecting a sequence of slides in quick succession, simulating movement. The patent also allowed for the device to be used for photography. In 1892 his "Story of a Cloud" (showing changing formations) was projected with the rapid slide-changer to the Royal Photographic Society.

Acres apparently made sequence photographs on 2¾ inch unperforated celluloid c.1894. In association with engineer Robert Paul he eventually achieved motion picture success with a camera using perforated 35mm film. He left Elliott & Son in 1895, but the partnership with Paul quickly ended in acrimony. Acres made films in Germany in 1895, was the first to project a film publicly in England, and gave Britain's first Royal Command Film performance in July 1896. His 1895 films include "Oxford and Cambridge Boat Race," "Rough Sea at Dover," and "The Comic Shoeblack." He later designed the first small-format home movie system, the Birtac, marketed in 1898. Unhappy with the showbusiness (rather than educational) exploitation of motion pictures, Acres concentrated on filmstock manufacture and processing in later years, but suffered severe financial setbacks. Bankrupted twice, he died 26 December 1918.

STEPHEN HERBERT

ACTINOMETERS AND EXPOSURE MEASUREMENT

The researches of Ferdinand Hurter (1844–1898) and Vero Charles Driffield (1848–1915) in the 1880s and 1890s established the basic principles of densitometry and sensitrometry that they applied to photographic exposure measurement. Their work was based on extensive observation and experimentation and was the first attempt to systematically relate light intensity and the density of exposure on the photographic plate. It was not the first attempt to produce a method of determining exposure by calculation or measurement but it allowed commercial manufacturers to produce photographic plates of consistent sensitivity to a widely adopted standard that allowed exposure measurement devices to become practical.

The first photographic exposures tables were published by C.F. Albanus in 1844 and journals and manuals would often include such tables as a guide to exposure. They were usually based on observation and were subjective and susceptible to variants in the sensitivity of photographic emulsion, optics and geography, as well as the rigour with which the author conducted his tests. W.K. Burton issued a comprehensive series of tables based on practical tests in 1886 that were still in use at the end of the century.

Antoine Claudet produced his Photographometer to measure the intensity of light details of which were published in March 1849 of the *Art Journal*. The device was also exhibited at the 1851 Great Exhibition and mentioned in several contemporary handbooks. Formal measurements were first conducted and published by Bunsen and Roscoe in 1858 which connected sunlight with the position of the sun to time of day and year. This work was expanded and developed by Hurter and Driffield who published extensive tables in 1888. Their work produced a H&D number that was used to indicate sensitivity and crucially they showed that each dry plate could be allocated a number which could form the basis of an exposure calculation. The commercial outcome of this work was their Actinograph, a calculator, which was patented in 1888 (British patent number 5545) and sold from 1892 by Marion & Co for a range of different latitudes and longitudes.

A range of other calculators appeared after this. J.A. Scott of the Britannia Works Co (later Ilford Ltd) patented a disc form calculator (British patent number 17642) and this became the main form of this type of calculator until their demise in the later 1950s. Hurter and Driffield refined their Actinograph in 1897 to a flat disc design. Cadett and Neall claimed sales of 10,000 for its own calculator by November 1897 and sales of nearly 20,000 for Dibdins exposure meter by July 1899.

Actinometers, also known as tint-meters, relate the time taken to darken a piece of light-sensitive paper to match a standard tint. A variant is to expose the paper for a fixed time under an optical wedge with steps of increasing density. The strength of the light is then indicated by the densest step under which exposure has taken place. W.H.F. Talbot noted the idea for an actinometer on 30 March 1840 to measure the time required to print out a negative and the idea was put to good use with many such devices in the later nineteenth century, especially for the carbon and platinum processes where the progress of printing could not be inspected directly as it could with ordinary silver printing.

Formal experimentation and measurement of light was published by Bunsen and Roscoe in a series of papers from 1858 to 1862 read to before the Royal Society and they established a standard grey tint of one thousand parts of zinc and one part soot. Earlier devices using a standard grey colour on silver chloride paper were produced by Jordan and Malagutti in 1839, Heeren in 1844, Hunt in 1845, Claudet in 1848, and Schall in 1853.

It was the work of Bunsen and Roscoe together with more consistent commercially produced sensitised materials that aided the spread of reliable actinometers. Before the mid-1860s paper and plates were coated

with sensitised chemicals that had been made by the photographer or commercially in small quantities. Their sensitivity varied until more consistent chemical production, larger production batches and consistency between batches and standardisation of lens apertures allowed reliable exposure measurement devices became feasible.

Louis Bing's provisional British patent of 13 September 1866 described an improved mode of and apparatus for determining the actinic power of light. In this actinometer a sheet of sensitised paper was exposed under a grid of mica squares of varying thicknesses for a standard time. The intensity of light was gauged by the number of mica layers through which it had passed. The patent was produced commercially as Bing's Universal Self Registering actinometer from 1866. Vogel's Photometer of 1868 was used as a printing meter and Woodbury's Photometer of 1879 was a comparison actinometer where a darkening strip of sensitised paper was compared against six standard tints. The time taken to match a particular density, chosen on the basis of previous experimentation gave an indication of the required exposure.

By the 1880s watch-form actinometer's gave exposure measurement a more practical air. Green and Füidge's 1884 actinometer (British patent number 14457) gave seven comparison tints and a transparent aperture behind which was a disc of sensitive paper that was exposed for one minute. Both this and the Woodbury actinograph required the photographer to calibrate his plates to the meter. Stanley and Sargeant's actinometer (British patent number 4624) of 1886 was designed to be suspended from a watch chain and held a ribbon of photographic paper sufficient for 500 measurements.

The two most commercially successful actinometers of the later nineteenth century was Alfred Watkin's Standard meter of 1890 (British patent number 1388) which was a short tube containing sensitised paper next to a standard tint which was exposed for one minute using the time the cap on a pendulum chain completed it's swing. The exposure was determined using a series of rings on the outside of the barrel. The Watkins meter was refined into the 1895 watch form and Bee meter from 1902 that was available up to 1939 and sold in very large numbers. The main competitor to the various Watkin's meters was G F Wynne's Infallible meter of 1893 (British patent number 10,617) which was in the form of a pocket watch containing a disc of sensitised paper and scales to determine the exposure. Variants of these basic designs appeared in Germany, France and the United States.

Although actinometers were popular there were other forms of determining exposure that saw some success in the nineteenth century although many of these re-emerged in the twentieth century to greater commercial success. Visual or extinction meters worked by viewing the subject to be photographed through a variable density filter. The last point where the subject could be seen gave a number which could be applied to a calculator to determine the exposure.

One of the first visual meters was demonstrated to the Société Français de Photographie in 1856 by Lanet de Limenci. His Lucimètre used a series of squares of different density number 1 to 16. The first successful such meter was J Decoudin's meter (British patent numbers 13332 of 1887 and 11578 of 1888) which was widely available. Others appeared usually in the form of tube that was held to the eye. The disadvantage of all visual extinction meters was the subjective nature of determining the reading to be applied to the calculator.

One alternative that found some favour was the comparison photometer where the brightness is measured against a standard light source. Leon Warnerke's (died 1900) device described by Eder as 'the first practically serviceable device for measuring exposures' was the subject of British patent number 185 of 1880 and was placed in the market in England. It used a disc of phosphorescent material activated by light and the extinction principle was used to determine a numeric value. Other devices such as H D Taylor's Photometer of 1885 used a candle. Wernerke's Actinometer as it was called allowed dry plate manufacturers and photographers to obtain a precise measurement of the sensitivity of silver bromide plates rather than the guesswork which had been common until thenand it was adopted as a standard in 1881. The Warnerke sensitometer was displaced in 1894 by rotating wheel densitometers.

With the precise measurement of sensitivity given by Warnerke's device to a common standard, later supplemented by the longer-lasting H & D and German Scheiner scales (adopted from 1899) a clear basis had been established to determine exposure by calculator, extinction or comparison methods, culminating in the twentieth centuries ASA and ISO measure of film sensitivity.

MICHAEL PRITCHARD

See also: Hurter, Ferdinand, and Driffield, Vero Charles; Claudet, Antoine-François-Jean; and Société Française de Photographie.

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ADAM-SALOMON, ANTOINE-SAMUEL (1818–1881)

French sculptor and photographer. Born at La Ferté-sous-Jouarre, Seine-et-Marne,

Adam-Salomon was destined for a mercantile career when in his youth he entered the Fontainebleu factory of Jacob Petit as a modeler. When his talent for sculpting was discovered, he received an official scholarship to study in Paris. Salomon turned to photography in midlife and continued to practice both art forms. By the time his portrait work came to public attention at the Paris International Exhibition of 1867, Salomon had already been practicing photography for eight or nine years, accumulating 15,000 negatives of the most estimable sitters. His portraits, three-quarter length figures, and some full-length, reveal his marvelous arrangement of light and shade.

Working in a 10 5/8" × 8 1/4" format, Salomon's prints were renowned for their deep rich blacks, pure whites, and continual tonal gradations between these extremes. Discussed in terms of their "brilliancy, boldness, and relief," his portraits often took one hour to pose, fifteen-seconds to shoot, and up to three hours to print. Salomon observed, "It is far more difficult to produce a good photographic portrait than a painted portrait."

Solomon used special lighting techniques which may have accounted for his rich graduated tonal range. In his studio, even overall light emanated from the ground-glass ceiling and light from clear-glass sides could be modulated by a curtain. Equally, his inventive props adjusted to the subject's height making the sitter comfortable and the pose appear more natural. His illustrious client list included: the architect Charles Garnier, French philologist, Joseph Ernest Renan, the dramatist Emile Augier, and journalist and novelist Alphonse Karr. He was praised and photographed by his contemporary Nadar.

Margaret Denny

ADAMSON, JOHN (1809–1870)

British photographer and physician

As a member of the British scientific community in the 1840s, John Adamson was an early innovator in photography, producing the first calotype photographs in Scotland and making key technical changes to stabilize the process and improve results. Though he never practiced photography professionally, Adamson instructed and encouraged many others, helping establish the primacy

Adamson, John, "Portrait of woman seated in profile." From the album "Photographs A.A. Bell." 27 mounted and 9 unmounted prints.
Courtesy: The J. Paul Getty Museum, Los Angeles. © The J. Paul Getty Museum.

of Scottish photography in the medium's early years. Most notably, in training his younger brother Robert Adamson, he contributed to the celebrated collaboration between Robert and David Octavius Hill that set the standard for artistic achievement in photography.

Adamson was born in Fife, Scotland in 1809, the first of 10 children to Alexander Adamson and Rachel Melville, farm owners from Burnside, Scotland. He studied medicine at St. Andrews University and the University of Edinburgh from 1826 to 1829 and concluded his studies in Paris in the early 1830s. After working as a ship's surgeon in Asia, he returned to Scotland to open a medical practice in St. Andrews in 1835. He befriended the eminent scientist Sir David Brewster while lecturing part-time in chemistry and natural science at Madras College, St. Andrews University, between 1837 and 1840.

It was probably as a member of the St. Andrews Literary and Philosophical Society—founded by Brewster in 1838—that Adamson first became acquainted with photography. As a confidante of photography inventor William Henry Fox Talbot, Brewster showed early examples of Talbot's "photogenic drawings" at meetings of the learned society in 1839. In May 1841, Talbot disclosed the details of his recently-patented calotype

process to Brewster and, since Talbot's patent did not extend to Scotland, Brewster shared the information with his St Andrews colleagues. Adamson immediately embarked on learning the process.

Although he had already taken photographs with the rival daguerreotype process, for the first few months neither Adamson nor his colleagues had much success with calotypy, despite numerous experiments. By autumn, Adamson had produced several negatives but still encountered difficulties in making durable positive prints. Nonetheless, Brewster found Adamson's work promising enough to send several examples to Talbot in November.

It was not until May 1842 that Adamson executed a satisfactory calotype print, which was not only the first such photograph made in Scotland, but also one of the earliest accomplished by anyone other than Talbot. A very faint half-length portrait of his sister Melville, Adamson noted it required a two-minute exposure in "bright sunshine [... with a] temporary camera obscura made with a common small lens or burning glass" (Michaelson, 34).

The breakthrough encouraged Adamson to undertake further experiments and in his enthusiasm he taught the process to his brother, Robert, an engineering student who soon envisioned becoming a professional photographer. The pair collaborated closely on many experiments and photographic excursions throughout the summer of 1842 and into the beginning of 1843, by which time Robert felt skilled enough in the process to move to Edinburgh and open a commercial studio.

Unlike Robert's eventual business partnership with Hill, the Adamson brothers' collaboration was an amateur effort as concerned with resolving the technical shortcomings of Talbot's fledgling process as with producing visually stimulating compositions. The cooperation between the two brothers during this short, but intense period, resulted in crucial improvements to the process that served as the means to Robert's stunningly rich prints as a professional.

Adamson sent a small presentation album of his and his brother's best work to Talbot in November, 1842, perhaps to gain the inventor's approbation for his brother's professional aspirations. Another album (in the collection of the National Museums of Scotland) is organized like a working notebook and clearly illustrates the technical and aesthetic evolution of their pioneering achievement. Amidst considerable discrepancies in print quality, Adamson's accompanying notes document the constant chemical and procedural improvisations that marked their efforts.

The Adamson brothers made family portraits, architecture studies and even some scenes of local fishermen that acknowledged the older Adamson's medical concern with sanitation reform among fishing communities. These possibly served as the source for Robert's later series with Hill on the fishing families of Newhaven. Many of the photographs, like "The Priory and the West Gable of the Cathedral" (c.1842), exhibit a flattened perspective and awkward framing that suggest they were made primarily to work out photo-processing problems, but the more inventive framing found in images like "A Farm House" (c.1842)—with its elevated and angled view—attests to the brothers' growing awareness of compositional issues.

Even after Robert's partnership with Hill was well-established, Adamson continued making calotypes and may have had more than a passing relationship with the Edinburgh studio, perhaps even aiding the partners on occasion. As it were, even after two years of working with Robert, Hill still saw the brothers as a formidable pair when he conjectured that "both from [Robert] and his brother [John] much new improvements may yet be expected" (Stevenson, 54).

Upon Robert's untimely death in 1848, Hill briefly may have hoped to engage the older Adamson brother as successor. Despite an enduring interest in the medium, Adamson never considered it as a full-time profession and was not willing to sacrifice his established medical practice for the uncertainties of running a studio. Nonetheless, he remained on good terms with Hill and pursued portrait photography on a more modest scale, both individually and in conjunction with his former student and photography assistant, Thomas Rodger, who owned a studio in St. Andrews.

Adamson's photograph of a bare-chested athlete (c.1850) demonstrates an artistic talent that he perhaps too often ignored in pursuit of his scientific inquiries. The subject's determined stride and flexed muscles project a classical strength verging on the heroic. Though such striking images were the exception in his work, even as late as 1867 he was producing personal portraits of his family for a commemorative album for his nephew, in perhaps his last project before his death in St. Andrews in 1870.

While Adamson's contributions to photography were significant, especially in its technical development, his amateur status and public diffidence left him relatively neglected in subsequent histories of the medium. It is only since the early 1980s that his work has received greater consideration, not only in its importance to the achievements of his brother and others, but on its own terms.

STEPHEN MONTEIRO

Biography

John Adamson was born in Fife, Scotland in 1809 and studied medicine at the University of Edinburgh, St. Andrews University and in Paris (1826–early1830s).

He was a professor of chemistry and natural science at St. Andrews University and served as a medical officer for the town of St. Andrews, publishing a study of local public sanitation measures. He took up calotype photography in 1841 and taught his brother Robert, as well as Thomas Rodger and likely others. He produced Scotland's first calotype in May 1842 and collaborated extensively with his brother on perfecting the process. Although his efforts slowed once his brother opened a professional studio with David Octavius Hill in 1843, he remained involved in photography and took portraits individually and with Rodger until shortly before his death. He contributed photographs to the Edinburgh Calotype Club in the 1840s and was a member of the Literary and Philosophical Society of St. Andrews, serving as its museum curator from 1838 until his death. He was married to Esther Alexander and had a daughter, Tetty. He died in St. Andrews, Scotland, in 1870. His work is in the National Museums of Scotland, the J. Paul Getty Museum, the St. Andrews Preservation Trust and the St. Andrews University Library.

See also: Calotype and Talbotype; Hill, David Octavius and Robert Adamson; Brewster, Sir David; and Talbot, William Henry Fox.

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ADVERTISING OF PHOTOGRAPHIC PRODUCTS

In general photography was no different to other manufacturing and retailing sectors in the way it approached its advertising. Different methods were adopted for advertising throughout the nineteenth century reflecting the different markets for photographic products and the changing nature of photography itself. The methods that the photographic studio used to advertise itself directly to the general public were different to that adopted by photographic manufacturers who were appealing to professional photographers and, later, directly to amateur photographers and a wider public.

The announcement of the daguerreotype in 1839 generated an enormous amount of editorial coverage in newspapers and more specialised Victorian periodicals. *The Times* newspaper, *Art Journal* and publications such as the *Athenaeum* regularly reviewed photography, covered developments and the activities of, mainly, London-based photographers. From the early 1850s this coverage declined rapidly as photography became established as a trade and there were fewer significant technical developments of interest to the general public. The growth of specialist photographic journals and a trade press from 1853 and 1854 respectively meant that these developments could be dealt with internally. Throughout the rest of the century photography was only of limited editorial or news interest and photographers had to undertake more extensive marketing activities to promote their business.

Studios

The principal studios in London and other cities and towns from the early 1840s regularly advertised. They made use of newspaper and periodical classified advertisements, directories and more specialist publications such as *Bradshaws* railway timetables to maximise their audience reach and to ensure that new visitors would have awareness of them. This was increasingly important with the rapid growth in the number of studios from the early 1850s. Often these advertisements were simple text, but with more commercial success or more creative copy writing the text would carry recommendations, details of patrons or mention of medals and prizes won by the photographer.

The growth of an affluent middle class and eager consumerism from the 1850s and a depression in demand for photographs in the mid-1860s all provided an added impetus for photographers to promote their services. Price cutting was used to increase sales and claims exaggerated to create demand. As early as the late 1850s, a number of photographers were spuriously claiming royal patronage, which was recognized as supporting a studio's commercial success and prestige. It was not until 1895 that the issuing of Royal warrants was firmly regulated.

Other more subtle forms of advertising was undertaken, for example, the offering of free sittings to members of society, statesmen, literary figures and celebrities whose portraits could then be sold as *carte de visite* or

cabinet cards. The resultant publicity, both free and paid for, could generate sales of tens of thousand for a single *carte*, each carrying the photographer's details on its back. The *carte de visite* craze and new standard styles of presenting photographs supported a specialist stationary trade supplying customized mounts, envelopes and studio paperwork branded with the photographers name and studio details. Marion & Company and the London Stereoscopic Company both of London and Percy Lund & Company of Bradford were perhaps the best known. The growth of chains of studios in the later nineteenth century, such as A & G Taylor which had twenty-five branches across Britain by 1880 offered the public familiarity and, perhaps, a consistency in the style of work produced. Such studios advertised extensively.

Photographic manufacturers and retailers

If the photographic studio was focused on reaching the general public, then photographic manufacturers and retailers from 1839 until the later 1880s were more interested in reaching photographers, photographic studios and the serious amateur or art photographer to sell equipment, sensitized materials and photographic requisites. Occasional advertisements in specialist art journals were used but manufacturers often used more targeted means of reaching their markets. The specialist photographic press would carry advertisements (which were frequently discarded when the loose issues were bound) and year books carrying formulae and reference material which would be kept for longer periods of time carried extensive advertisements from the 1860s especially as the photographic trade began to specialize. Some firms such as Horne & Thornthwaite, J.J. Griffin and others had their catalogues bound into the back of photographic manuals or books; in some cases the company would commission the book or a staff member would write it. Firms such as Negretti and Zambra, Fallowfield and Houghtons amongst many issued their own separate catalogues particularly from the later 1860s. By the end of the century some of these were over 1,000 pages carrying thousands of different products.

The later 1880s and especially the 1890s saw the advertising of cameras and photographic goods in more mainstream publications and targeted at the consumer. This was partly facilitated by the growth of a popular press able to print with lithographed illustrations. *The Illustrated London News* and *Punch* for example, all carried extensive display advertising. The key driver for this change in emphasis was the growth of popular photography epitomised by the Kodak camera of 1888 which by the early 1890s was extensively advertised outside of the traditional photographic press directly to an amateur audience. The company saw branding as essential in ensuring that a consistent, familiar, image was given to its customers: everything from the Kodak name itself to its retail shops was part of this. In the late-1890s George Davison, Kodak's managing director in Britain, asked designer George Walton to style its shops. The Kodak girl was introduced in 1901 to appear in advertising to emphasise style and the simplicity of Kodak photography. Other manufacturers moved some of their advertising into more mainstream publications: the main British companies of Lancaster, Thornton-Pickard, Houghton and Butcher all targeted the amateur directly with their cameras and photographic products before the century was over. Well-known illustrators were used to prepare advertisements.

The photographic trade's early focus of mainly targeting professionals and the serious amateur had, by the end of the century, broadened into a much wider consumer strategy as the amateur and family photographer began to grow in commercial importance. Cameras and sensitized materials were being mass-produced and sold directly to the consumer and advertising played a key part in this process.

MICHAEL PRITCHARD

ADVERTISING USES OF PHOTOGRAPHY

During the late nineteenth century, manufacturers began placing visual images in the mass media to create and promote brand-name products. Advertisers began to understand that images could be designed to sell products and services by making irrational appeals to consumers' needs and desires. Photography's aptitude as a factual and persuasive tool to sell goods and services to potential customers, grounded in the perceived "truth" of camera images, is what gave the medium such potential to be coupled with advertising text.

Photography in service of product illustrations and sales aids had its earliest beginnings in daguerreotypes, calotypes, and in the collodion era, ambrotypes, *cartes de visites*, cabinet cards, and stereographic cards. The precedent for illustrating product through photography appears in Louis Jacques Mande Daguerre's *Still-Life*, 1837 and *Shells & Fossils,* 1839, daguerreotypes of objects arranged in his studio. Equally, the calotype process provided opportunities for documentary product photography in the early days of the medium. In *The Pencil of Nature*, published between 1844 and 1846, William Henry Fox Talbot had demonstrated that the camera was an excellent tool for documenting sculpture, china and glassware, and even a sample of lace. In essence his serial publication was an advertisement for the calotype process of photography itself.

Photography's earliest influence upon illustrative art for print media was exerted through the process of the woodcut. The photograph's initial role relating to adver-

Bierstadt, Charles. Point View, Niagara, New York.
Courtesy: The J. Paul Getty Museum, Los Angeles. © The J. Paul Getty Museum.

tisement during the mid-nineteenth century was to serve as a template for wood engravers to make a wood block print. Later photomechanical printing techniques such as the woodburytype and photolithography attempted to reproduce the appearance of the continuous range of tones found in a photograph. Interim printing processes such as the collotype and photogravure all required photography to be separately printed and mounted or tipped into the text.

From the mid-nineteenth century on, photographic images were coupled with advertising on posters, trading cards, and stereographs or in promotional volumes such as trade albums, patterns books, and business directories. An early application concerned the sale of real estate property around Paris. In 1854, *La Lumière* reported new applications of photography when the Bisson Brothers' photographs of residences for sale were attached to promotional posters and hung in train stations.

Ambrotype views by Mrs. Bethia Mead formed the basis for engravings to promote commercial real estate in Chicago. In 1857, her photographs of the prestigious Iron Block Buildings along the city's Lake Street business district appeared reproduced in the elite journal *Chicago Magazine*.

By 1858 the British photographic team of Padbury and Dickins, specializing in product photography, recorded centerpieces, church furniture, and toast racks on stereographic cards. Photography in this practice was a benefit to the middlemen, traveling salesmen, as they could show their potential customers product images instead of carrying around heavy samples.

In 1865 cartes de visites were affixed to wanted posters advertising the $100,000 reward for the capture of President Abraham Lincoln's murderers: John Wilkes Booth, David C. Harold, and John H. Surrat. The posters were commissioned and distributed by the United States War Department.

By the 1870 and 1880s cabinet cards promoted disparate product such as weaponry as in L. Lafon, *Rapid Fire Hotchkiss Cannon, 37mm*, for Hotchkiss Arms and scientific laboratory apparatus for the Wood & Comer Ltd. (with a printed guarantee on the reverse) Various kinds of trade albums and business directories survive. In 1870 the French photographer Lafon was commissioned to document the Hotchkiss line of military equipment. Lafon's work differs from many product albums of the day as his showed the goods in service; his photographs showed French soldiers and sailors demonstrating the operation of guns. Another promotional album, the *Illustrated Catalogue of Locomotives*, Philadelphia: J. B. Lippincott & Co., 1871, featuring locomotives built by the Baldwin Locomotive Company of Philadelphia illustrates the many types of products enhanced by photography.

In the same city, the *Gallery of Arts and Manufacturers of Philadelphia*, a directory illustrating the wares of fifty-six businesses, issued in 1871 by the photographic firm of Wenderoth, Taylor & Brown, and publisher William Ritter, constitutes an advertising project on a grand scale. Products represented in the *Galler*y, luxury goods such as jewelry, watches, and perfume and utility items, drugs, chemicals, sewing machines, dental tools, and stationary, were featured with city businesses, for instance, Wanamakers and Brown's Oak Hall, one of the nation's first department stores, and the Continental Hotel, one of the first in the country to install an elevator

and electricity. Traveling salesmen carried the bound album of albumen silver prints surrounded by advertising text to show prospective customers the availability of products and services.

The creation of business directories integrating photographs of city streets, establishments, and shops signs became a viable method for promoting local merchants. An outstanding example of the photographically illustrated business directory is Isaiah W. Taber's *View Album and Business Guide, of San Francisco, Photographically Illustrated*, published around 1884. An example of Taber's promotional cabinet card couples an interior factory view of San Francisco's largest printing firm, Schmidt Label and Lithographic Co. with architectural renderings of their three-story structure before, during, and after having recovered from an 1884 fire. Taber linked much of his photographic work to the tourist trade. His two album set, *California Scenery and California Scenery and Industries*, were part of a commercial endeavor and contained images from Taber's extensive files linked to advertising text.

The introduction and practical application of the half-tone printing process by the 1890s revolutionized print illustration and established photography in its practical and preeminent role as illustrator for the advertisement industry. In 1897 the *New York Tribune* became the first publication to reproduce halftones daily. In its much perfected state, the half-tone was capable of nearly faithful reproductions of the tonal ranges and shadows of the original photograph for magazine and newspaper prints.

At the turn-of-the-century, the history of photography and advertising history coalesced yet further with the proliferation of cheap widely distributed magazines, and their ability to bring advertised product directly to the customer. *McClure's, Munsey's,* and *Ladies Home Journal,* as well as a score of other magazines emerged in the late 1890s based on the literary principle that individuals could be encouraged to buy and read magazines if the content was designed to catch their interest. Principally, the larger circulations gave impetus to manufacturers to advertise their products and publishers began to realize 80% of their income from advertising revenues. Halftone brought new creative freedom to layout design by making it possible to seamlessly combine photography, line drawing and typography into a unified composition.

During the last decade of the nineteenth century, with the rise of manufacturers prone to want their articles shown worn or used by living models, in preference to drawings or lithographs, studio photographers discovered advertising photography to be a profitable business. For his or her role in the imaging of products and services, the photographer needed to make everyday objects aesthetically pleasing and marketable. Many photographers came to advertising from portrait studios and found they could enliven the object with the addition of a human presence.

By the 1890s product photography shows the industry preference for live models demonstrating product benefits such as the Munsingwear advertisement for Northwestern Knitting Co. and Smith's Bile Beans.

In an era when few women ventured into photography as a profession, Kate Matthews of Pewee Valley, Kentucky, located a short distance from Louisville, made a name for herself when her photographs were used in advertisements of the Old Flour Mill Company and the J. B. Williams Company. Likewise, Chicago photographer Beatrice Tonnesen successfully entered the field of advertising photography as an extension of her portrait photography beginnings. Tonnensen's advertising work began in the late 1890s when a manufacturer sought out her photography skills to produce a corset ad. From these auspicious beginnings Tonnesen ran a successful studio for nearly a quarter of a century photographing products ranging from butter to lawnmowers, always using attractive models, young women and children, to enhance the subject being advertised.

As the demand for "realism" in advertising images grew, the new industry of modeling agencies sprung up to support photography's role in advertising. Equally, the demand on the part of the manufacturer to continually show a "pretty woman" and the perceived importance of a "fresh face" to demonstrate the benefits of their products and services required modeling agencies to continually look for new models. To solve this problem photographer Beatrice Tonnesen operated her own modeling agency, one of the country's largest—providing easy access to new subjects for her growing advertising business.

The early history of advertising photography remains a verdant field for further examination. In archival collections, advertisement photographs have quite often been hidden from view as they were typically not signed and end up buried along with other still-lifes or scenic views. To protect and promote their enterprises, some in the industry like Chicago photographers Beatrice Tonnesen and J. Ellsworth Gross stamped the lower corner of their photographs with a copyright.

Leading trade journals, *Printer's Ink* and *Progressive Advertising*, began publication in 1891 and continued to advance the advertising industry well into the twentieth century.

MARGARET DENNY

See Also: Daguerreotype; Calotype and Talbotype; Wet Collodion Positive Processes; Cartes-de-Visites; Cabinet Cards.; Daguerre, Louis-Jacques-Mandé; Talbot, William Henry Fox; Woodburytype; Bisson, Louis-Auguste and Auguste-Rosalie; and Half-tone Printing.

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AERIAL PHOTOGRAPHY

Prior to the advent of airplane flight early in the 20th century, the only means of obtaining aerial photographs was via birds (mainly carrier pigeons), flying devices (balloons, dirigibles kites, gliders, or rockets), or by elevating the camera itself through various means such as artificial structures—ladders, cranes and buildings—, or geographic features such as hills and mountains. Aerial photography today is most often associated with powered aircraft flying at altitudes usually starting at 1,000 feet. Air photography today incorporates two types of orientation to the ground: vertical and oblique. Rupert Martin and other photo historians argue that the vertical aerial photograph and an appreciation of it as an aesthetic art form is a modernist viewpoint reflected in society's consciousness of powered flight. The oblique aerial photograph as an aesthetic convention extends back to the very first photographs taken by Daguerre in 1839. His daguerreotype, "Boulevard du Temple, Paris," looking down at the street from within or on top of a building is also heralded as the first to capture a human figure. Another version of the daguerreotype exists in which the man is not visible and a wagon or cart appears parked opposite the shoeshine stand. Daguerre also took several other daguerreotypes of Paris from an aerial perspective. Some photographers even experimented with a vertical perspective when appropriate such as views down geyser holes or mineshafts, and early pioneers in balloon photography and aerial photogrammetry such as France's Nadar (Gaspard-Félix Tournachon) worked on the problem of stabilizing the camera in a vertical position. He patented a device in 1858 to maintain the camera in a vertical orientation.

While innovative photographers such as Nadar and the Boston photographer James Wallace Black took great personal risks in balloon photography, historians acknowledge that aerial photography in the 19th century from anything other than artificial, fixed structures or geographic features was more of a novelty than a reality. Nadar took the first aerial photographs from balloons in 1858 at heights ranging from 262 feet (his first showing the village of Petit Bicêtre) to 1,600 feet (the one most often published showing Paris). He was honoured for this achievement by his cartoonist friend Honoré Daumier (1808–1879) who produced a satirical illustration titled in English "Nadar Raising Photography to the Height of Art." Nadar, in addition to devoting considerable energy towards solving some of the problems of aerial photography by manned balloon, also promoted aerial travel. He founded the Société d'encouragement pour la navigation aérienne and published his own magazine *L'Aéronaute*. His famous and short-lived passenger balloon *Le Géant* (The Giant), which made only two ascents from Paris in October 1863, included a two-story passenger compartment along with a photographic darkroom. On 31 July 1868 the French magazine *Le Petit Figaro* published a reproduction based on an aerial photograph Nadar took which showed the Arc de Triomphe.

Nadar was not the only photographer conducting experiments with cameras and balloons, both unmanned and controlled remotely from the ground. James Wallace Black took the first photograph from a balloon in the U.S. of Boston on 13 October 1860 at a height of 1,200 feet. One early book on the history of ballooning credits the British scientist aeronaut James Glaisher (1809-1903), accompanied by balloonist Henry Coxwell, with the first unsuccessful attempt on 5 September 1862 to photograph a cloudscape from above the clouds. This was on the historic ascent on which they reached the highest yet elevation in a balloon and nearly perished from oxygen deprivation: around 37,000 feet (7 miles). Photographer Henry Negretti (Negretti & Zambra) chartered Henry Coxwell's balloon *Mammot*h in 1863 for a flight near London. Due to the gondola's rotation, none of the wet-plates were successful. English inventor Walter Bentley Woodbury patented a camera in 1877 which could be controlled from the ground through an electric cable. Inventors in other countries such as the Russian Viacheslav Sreznevskii also designed aerial photography cameras; whether this was in 19th century is not clear. The introduction of dry-plate technology and better camera equipment meant photographers could concentrate on image taking rather than the preparation time for taking a photograph. The French photographer Jean Nicolas Truchelut is credited with taking the first photographs using a dry-plate camera on a balloon flight over Paris in 1879; his name is sometimes misspelled as Triboulet. Other early French successes in aerial photography with dry plate technology are credited to photographer Paul Desmarets in 1880 over Rouen and the work of writer and photographer Gaston Tissandier

Black, James Wallace. "Boston, as the Eagle and the Wild Goose See It." *Courtesy: The Metropolitan Museum of Art, Gilman Collection, Purchase, Ann Tenenbaum and Thomas H. Lee Gift, 2005 (2005, 100.87) image. © The Metropolitan Museum of Art.*

in the mid-1880s. The earliest known air photograph from a balloon taken in Canada was taken in 1883 via remote control by Royal Engineer Captain Henry Esdale in Halifax, Nova Scotia, in August 1883. This image is a vertical, not an oblique, perspective from an altitude of 1,500 feet. Upon his return to England he continued to experiment with balloon photography. The English photographer C.V. Shadbolt also took vertical photographs of London from a balloon in 1883. J.M. Bacon credits himself and J. N. Maskelyne with patenting a late 19th century (prior to 1902) aerial photography invention: "a small captive [balloon], carrying aloft a photographic camera directed and operated electrically from the ground." By the early 1890s with even more sensitive dry plates and smaller cameras, photographers such as Philadelphia's William Nicholson Jennings boasted of excellent results given the right weather conditions and a tethered balloon.

Besides its use as a novel viewpoint for photographers adventurous to take flight, there were three main categories of aerial photography from balloons: surveying, military observation and exploration, including scientific observation. François Jean Dominique Arago, the man who publicly announced Daguerre's invention, first referred to the use of photography in 1840 for mapmaking or phototopography. Nadar around 1853 connected the use of balloons for aerial surveying or aerial photogrammetry. The first successful experiments in photo topography were conducted in 1849 by Colonel Aimé Laussedat (1819–1907), a French army engineer. Laussedat, simultaneously but separately from Nadar's promotional work with aerial photography by balloon, experimented with aerial surveying using kites and balloons. At the Exposition Universelle, Paris in 1867 he exhibited the first map compiled from a stereographic aerial image. Laussedat's work, along with that of other surveyor innovators in the 1860s and 1870s, was extended by the Canadian Dominion Lands Surveyor General, E.G.D. Deville (1849–1924) in the mid-1880s. He published the first book about the subject, *Photographic Surveying* in 1889. His technique later proved far more efficient than traditional survey methods during an early 1890s international boundary survey in the southeast Alaska mountains. The term "photogrammetry" was coined in 1893 by Dr. Albrecht Meydenbaur (1834–1921). C.B. Adams, a U.S. Army officer, was granted a patent in 1893 for an aerial photogrammetry method involving two balloons and cameras to produce

overlapping photographs which could be converted into topographical maps.

Military applications, while obvious to scientists, photographers and balloonists themselves, were not immediately apparent to many military officers. There does not appear to have been any attempt made by either the British-led allied army or the Russians to photograph from balloons during the Crimean War (1854–1856) which was the first international conflict closest to photography's birth. The British balloonist Henry Coxwell failed to convince the British War Office to use balloons in the Crimea. The United States Civil War was the first large-scale military action in which balloons played a role on both sides. While their presence made no difference to the outcome of the war, the first and successful use of balloons by the Union (Northern) Army is inspired the Confederate (Southern) Army to establish its own balloon corps. There appears, however, to be disagreement on whether photographs were taken from balloons during the United States Civil War. F.S. Haydon, who published the first detailed study of military ballooning during the war, concluded that absence of evidence meant evidence of absence. Another author came to a another conclusion based on Union Army reports which described the use of aerial photography to create a map-like image used by ground commanders and the aerial observer.

The U.S. Civil War is acknowledged to be the source of British air power developed under the leadership of the Royal Engineers who also operated in Canada and elsewhere in the Empire. A Royal Engineer observer of balloon operations took his experience back to England. Because of the public expense and the somewhat impractical nature of maneuvering and transporting balloons, the British Army, of which the Royal Engineers is a part, only slowly yielded to the inevitable. It took nearly two decades for a balloon detachment to be incorporated into the British Army chain of command. With typical British thoroughness, however, in the early 1880s "The training of the aeronauts incorporated aerial reconnaissance, photography and signalling…." (Mead, 1983, p. 19). Like Great Britain, France also established a special school for instructing its military in ballooning and photography.

Military conflicts in which aerial photography was practiced or thought to have been used via balloons/dirigibles, kites, gliders, rockets and pigeons were the 24 June 1859 French action under Napoleon III at the Battle of Solfernia, Italy; the Spanish-American War of 1898; and the South African (Boer) War of 1899–1902. Lord Baden-Powell, who invented a man-carrying kite, had a non-manned version used during the South African War at Modder River for photographic reconnaissance. A British Army balloon section was sent to China during the Boxer Rebellion in 1900 but saw no action.

One of the more unusual accounts of photography and ballooning occurred during the Siege of Paris in the Franco-Prussian War (1870–1871). Although Nadar was in charge of the balloon corps during this conflict, aerial photography by balloons does not seem to have been utilized. Microphotography, however, was employed in the Siege of Paris to reduce the size and weight of letters carried out by carrier pigeons. A Paris photographer, René-Patrice Dagron (1819–1900), perfected the microphotography technique and was smuggled out of Paris with his equipment on 12 November 1870. The balloons, one of which held the microphotography equipment, were named *Niepce* and *Daguerre*. The first carrier pigeon camera was patented in 1903 by the German experimenter Julius Neubronner; he also developed a panoramic camera for the birds in 1912.

The most tragic association between ballooning and aerial photography is the story of the Swedish adventurer Salomon August Andrée's fatal 1897 expedition in his balloon, the *Eagle*, along with two companions, to reach the North Pole by air. The remains of the expedition, including undeveloped photographs, were only discovered in 1930 on White Island, Spitzbergen. Some of the photographs taken by Andrée and his companions were developed by G. (or J.) Hertzberg, a detailed account of which appears in a book commemorating the journey. Expedition member Nils Strindberg, who was the principal photographer, built his own camera.

If photography from balloons can be considered a partial success in the 19th century, then photography from other aerial contrivances such as kites and rockets was, at best, even more of a novelty. The introduction of roll film by the Eastman Kodak company permitted further kinds of experimentation with aerial photography because cameras were considerably lighter. Kite photography was primarily used for meteorological experiments and military observations, and were conducted to this end beginning in the 1880s. Amateur experimenters invented their own ingenious kite and photographic systems. In some cases the camera was triggered from the ground, and in other cases, particularly with early rocket photography, the camera was on a timer. The photographic results were completely unpredictable and mainly served as experimental evidence. Probably the most celebrated figure in kite photography is Arthur Batut (1846–1919) of Labruguière, France. He is sometimes credited with being the first to take a successful photograph using a kite in either 1887 or 1888. Batut published the first book on kite aerial photography: *La photographie aérienne par cerf-volant* (Paris: Gauthier-Villars, 1890). The Musée Arthur Batut in Labruguière preserves his work and celebrates his genius. Other early kite photography experimenters were E.D. Archibald (England, 1886), Emile Wenz who worked with Batut (France, late 1880s), U.S. Army Lieutenant Hugh D.

Wise (1895), the American William A. Eddy (1895), and Lord Baden-Powell (England, pre-1900). Early camera-carrying rockets include an 1888 model invented by Amedee Denisse (France) and another in 1897 by Alfred Nobel (Sweden). One of the first successful rocket cameras was patented in 1903 by Germany's Alfred Maul.

Despite the considerable and often dangerous ballooning activities experienced by photographers, high-altitude aerial photography from unpowered flying machines proved to be mainly a form of experimental photography and impractical until the advent of more stable aerial platforms (rigid airships or dirigibles, and airplanes) and more advanced photographic technology. The French engineer Henri Giffard flew the first self-propelled dirigible on 24 September 1852. Led by the English émigré Frederick Marriott (1805–1884), the first successful American experiment of a self-powered, rigid airship, the *Avitor¸* occurred in California in 1869. Captain Charles Renard and Captain Arthur Krebs,' airship, *La France*, flew several times near Paris in August 1884. Count Ferdinand von Zeppelin's self-powered, rigid airship, made its first successful flight at Lake Constance, Switzerland, in July 1900. None of these early dirigible experiments, however, appear to have involved aerial photography.

Aerial photography did not emerge as a separate, highly specialized branch of photography until it had fully proved its worth during World War One (1914–1918). In North America, Canada is regarded as a leader in the peaceful application of aerial photography in the first two years after the war. Many of the men who flew the aircraft and staffed the special cameras in freezing conditions were war veterans.

DAVID MATTISON

See also: Daguerre, Louis-Jacques-Mandé; Daguerreotype; Nadar (Gaspard-Félix Tournachon); Black, James Wallace; Glaisher, James; Negretti and Zambra; Woodbury, Walter Bentley; Dry Plate Negatives: Non-Gelatine, Including Dry Collodion; Dry Plate Negatives: Gelatine; Tissandier, Gaston; Expositions Universelle, Paris (1854, 1855, 1867 etc.); Eastman, George; and Kodak.

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AFONG, LAI; *See* LAI AFONG

AFRICA (SUB-SAHARAN)

Sub-Saharan Africa is a nineteenth-century term used to describe those countries of the African continent that were not considered part of North Africa, but synonymous with "the Dark Continent" for Europeans. In today's post-colonial world, it is a troubled and somewhat artificial term which, in the case of the history of photography on the continent, could perpetuate a fragmented and distorted view. Equally problematic is a unified history that, in the aim for comprehensiveness, risks concealing the diversity of national and regional expressions behind a mask of homogeny. For a fuller picture of the developments of photography in Africa as a whole, please also refer to the entries for Africa, North and Egypt.

Photography was introduced to Africa by European travellers as early as October–November of 1839. Frenchman Frédéric Goupil-Fesquet accompanying his uncle, the painter Horace Vernet and Swiss Pierre Joly de Lotbinière made daguerreotypes of ancient monuments in Egypt. Their photographs were photomechanically reproduced for Noël-Paymal Lerebours' *Excursions Daguerrians* (Paris, 1840–44) and Hector Horeau's *Panorama d'Egypte et de Nubie* (1841). Both publications catered for a well-established European market for Orientalist art that had developed since the late eighteenth century.

Steamships first brought photography to coastal cities and towns of sub-Saharan Africa. Advertisements in newspapers from the 1840s testify to daguerreotypists at work in major African ports of call on the maritime trade routes between Europe and Australasia. They appeared in the West African city of Freetown in Sierra Leone

by 1845.These early photographers were itinerants, producing mainly portraits for European settlers and locals for a few weeks at a time before moving on. While travelling daguerreotypists continued to service small towns, permanent photographic studios began to be established in busier locales from the mid-1840s. The most direct route to India and Australia was round the Cape of Good Hope, so photographers set up permanently along the South African coastline, and even inland, earlier than elsewhere in sub-Saharan Africa. In 1846 Parisian Jules Léger opened the first studio in Grahamstown, and Carel Sparmann, assisted by E. Jones and Dr S.N.H. van Sweel, established one in Cape Town. By 1861 there were around 40 photographic studios in South Africa. Also en route to India were the islands of Mauritius and neighbouring Reunion, where studios were first opened by Evariste Letourner at Port Louis in 1843 and by François Cudenet at Saint-Denis in the 1860s, respectively. From the late 1860s, West Africa saw the establishment of permanent studios run by Europeans, Africans and photographers of mixed origins. Washington de Monrovée opened the first studio in St-Louis (Senegal) in 1860 and was followed by Decampe the next year. Gerhardt L. Lutterodt, operating between Freetown (Sierra Leone) and Douala (Cameroon) in the 1870s, trained his nephew Freddy (1871) and son Erick (1884–1959) who opened studios in Accra in 1889 and 1904, respectively. Many of East Africa's early permanent studios were established by photographers of Indian origin. In 1868 A.C. Gomez from Goa opened the first studio in Zanzibar, branching out from his existing photographic business in India.

As elsewhere, early African commercial studios were not always profitable so photographers often supplemented their income by continuing to work in related professions, such as opticians, chemists, jewellers, printers, publishers and booksellers. Using imported materials and equipment of European manufacture, they kept up to date with developments in photographic technology and styles. Studio owners practiced a variety of photographic processes, including the calotype and wet-plate from the mid-1850s. However the potential explosiveness of the collodion (guncotton in ether) required for the preparation of the wet-plate negatives made shipping dangerous. The studios offered cased, *cartes de visite*, cabinet and hand-tinted photographs. Portraits, rural landscapes and scenes of life and new constructions in the rapidly growing towns were available for purchase by wealthy locals, Europeans and other foreign settlers. Unfortunately, due to the detrimental effects of the climate, few of these early photographs have survived.

From the late fifteenth century Europe had contact through trade with sub-Saharan Africa, yet by the early nineteenth century the peoples, cultures and geography away from the coasts and southern tip remained largely unknown to Europeans. The invention of photography coincided with the growth of European travel inland and the new medium was used enthusiastically, if not always successfully to document the pioneering explorations. The first photographs of the interior of sub-Saharan Africa were taken during Dr David Livingstone's (1813–1873) Zambezi expedition of 1858–1864 by its official photographer and cartographer Charles Livingstone (1821–1873). Journal entries by the expedition leader and other members recount Charles's lack of knowledge and skill with the wet-plate process and subsequent poor results. The expedition's doctor and naturalist Dr John Kirk (1832–1922) was more successful. He experimented with different techniques, and found waxed negatives most effective as they did not require the distilled water the expedition lacked. Kirk's subjects were chiefly buildings, boats, and vegetation. The Royal Geographic Society in London holds stereoscopes made in Zanzibar by James Augustus Grant (1827–1892) during John Hanning Speke's (1827–1864) Nile expedition from the island, through Uganda, to Gondokoro (Sudan) between 1860 and 1863. Grant's photographs show the British Consulate staff and buildings, slave markets, emancipated slaves and other local people. However, he appears to have abandoned photography in favour of coloured sketches once on the mainland.

Expedition and travel photography was beset by numerous difficulties. Transportation of all the necessary equipment, including a large and cumbersome camera, chemicals, plates and dark-room facilities, proved problematic in a climate and conditions which foreigner travellers found inhospitable. The intensity of the African sun, which the French publication *Moniteur Universal* had presumed as early as the 14th January 1839, would give instantaneous, sharp daguerrian images, caused over-exposure of plates. Camera and tripod were unbalanced by strong winds. Heat and dust played havoc with wet collodion. Dirty water deposited a film of mud and sand on developed plates, which were further damaged by the humidity. Processing had to be done at night, in the usually stifling and malodorous environment of a wagon covered by blankets and skins. Not only problems of a technical nature were encountered. Wild animals terrorised travellers. Diary entries also recount the reluctance and sometimes refusal of Africans to be photographed. Unlike their littoral counterparts, who had been photographed and practised photography from the 1840s, inhabitants of localities little visited by Europeans were understandably suspicious and sometimes fearful of the camera. That this was not always the case is exemplified by Thomas Baines' humorous diary entry for July 1862. He recounts a chieftain situated near Lake

Ngami refusing to be photographed because he was not suitably attired and bartering his consent for items of the explorer's clothing.

Since the 1798 publication and subsequent translation of Scottish explorer Mungo Park's (1771–1806) best-selling book about his travels on the Gambia River, the courageous adventurer had become a familiar and romantic figure in nineteenth-century European popular imagination. From the late 1870s travellers capitalised on this existing taste for tales of the 'Interior' by publishing photographically illustrated personal accounts and memoirs in books, contemporary newspapers and magazines. Henry Morton Stanley's (1841–1904) photographs from his second Central African expedition of 1874, which were probably the earliest produced by the dry-plate process in sub-Saharan Africa, contributed to the illustration of his *Through the Dark Continent* (1878).

Photography was also employed by the numerous missionaries who came to Africa. Taking advantage of local unfamiliarity with the technology, they made show-like photographic demonstrations to impress and gain influence in often volatile political climates. In 1862 William Ellis (1794–1872) of the London Missionary Society and author of the photographically illustrated *Three Visits to Madagascar* (1858) was embroiled in a political scandal surrounding the attempted assassination of the island's King Radama II. Another British missionary Henry Aaron Stern's (1820–1885) *Wanderings Among the Falashas in Abyssinia* (1862), an account of his conversion of Jewish Ethiopians illustrated by his photographs of the country and its people offended Emperor Theodore II (1818–1868) during a critical period for Anglo-Ethiopian relations. In 1863 Stern was arrested, beaten and imprisoned at Gondar and later Magdala.

Photography also served missionaries as a teaching and conversion aid. Lantern-slide shows of photographic images, created or borrowed by missionaries, were used to demonstrate the benefits of conversion and to teach biblical, moral and other educational stories. Shows were even used to compete with and distract from 'heathen' activities such as tribal dancing. Publicity, support and fund-raising for their missions in Europe were furthered by juxtaposed, staged photographs of naked and dirty, clothed and orderly 'natives' before and after conversion. Missionaries also contributed to the dissemination of photography on the continent by passing on their techniques and equipment to African assistants and friends. German administrator, Heinrich Klose, recorded teaching Meppo, a young Togolese boy to develop film in 1897.

Photography was also employed for ethnographic studies. The founding of Ethnological Society of London in 1843 was symptomatic of a growth in European interest in human races and their classification through the study of distinguishing external features and inherent characteristics. In Africa and elsewhere travellers and missionaries photographed native people to provide 'scientific' proof for the emergent disciplines of anthropology and ethnography. In 1866 the Royal Geographical Society, London appointed photographer and travel writer John Thomson (1837–1921) to instruct explorers in photography to improve the accuracy and professionalism of their visual records. Three years later the British Colonial Office ordered governors to collect and send to London photographs documenting the empire's various native races. Travellers took bust and full-length photographs in profile, back and front of nude indigenous people. French explorer and archaeologist Claude-Joseph- Désiré Charnay (1828–1915) produced a study in this style of the ethnically mixed population of Reunion in 1863, which is now held in the island's Natural History Museum. In Hamburg between 1873–1874, Carl Dammann (died 1874) gathered images of peoples of the world, sent by missionaries and travellers. Portfolios like Dammann's *Anthropologisch-Ethnologisches Album in Photographien* (1873–1876), organised portraits according to nationality and race and presented them in a grid-like chart that facilitated pseudo-scientific observations of 'racial' characteristics and the creation of taxonomies of ethnographic types. European categorization of 'natives' conveniently justified their subjection to authoritarian and colonial powers.

Photography was integrated into colonial administration, both aiding and documenting European expansion in sub-Saharan Africa. Applied to surveying, map-making and the reproduction of plans, it greatly increased European knowledge of the terrains into which they ventured. The usefulness of the medium for recording military operations was recognised early on in Britain where the War Department appointed Charles Thurston-Thompson (1816–1868)), Superintendent of Photography at the South Kensington (later Victoria and Albert) Museum, to train the Royal Engineers in photography in 1856. During the Abyssinian Expedition of 1868, they photographed their camp, soldiers and their activities along the 400 mile journey inland from Zula, Eritrea to the mountain citadel Magdala. The photographs are in the Victoria and Albert Museum, London. The Anglo-Zulu wars of 1879–1884 and the British expedition to Benin in 1897 were also documented. George T. Ferneyhough, who was the first non-military professional photographer to accompany the British troops in the field, covered the Anglo-Zulu wars and published his work in an album of views. War photojournalists corresponding for newspapers were rare until the early twentieth century. Filippo Ledru, who reported the Italian landing in Massawa in 1885 was one early exception.

Photographers were employed to record engineering feats, such as the building of railways, roads and bridges, symbols of the civilising effects of the colonial endeavour. In the 1880s Cape Railways employed T.D. Ravenscroft. In the late 1890s William D. Young, official photographer for Ugandan railway, covered the construction of the Mombasa-Kampala line. From the 1880s publication of photographic albums of these infrastructural projects, such as J.A. da Cunha Moraes' *Africa Occidental* (1885–88), Robert Harris' *South Africa Illustrated* (1888) and *The Queen's Empire* (1897), increased. They depicted an idealized picture of the European presence in Africa to garner support for the colonial agenda at home. Colonial administrators also used photography to check and control native populations subjected to their rule. As early as the 1860s partners Acly and Lecorgne took identity photographs of African, Indian and Chinese immigrants disembarking at Mauritius point of arrival, Coolie Ghat, for the island's government.

Taking pictures as a hobby was popularised by the introduction of dry-plates and small hand-held cameras in the 1880s. Enthusiastic amateur photographers, including women, formed camera clubs, creating a forum for the exchange of information, advice and aesthetic ideas which they gained from the increasing number and range of photographic journals published. In sub-Saharan Africa, the first camera club meeting was held in Kimberley, South Africa in 1890. Contacts with the club movement in Britain were formed. Sir Benjamin Stone (1838–1914), President of the Birmingham Photographic Society, addressed the Cape Town Photographic Society in 1894. Previously, in 1882 a member of that club, C. Ray Woods, was the first in South Africa join the Royal Photographic Society in 1882. The clubs acquired premises with studio and dark-room facilities, exchanged prints and lantern slides, organised outings and participated in competitions. From 1896 a national salon organised by the Cape Town Society became an annual event. By 1895 there were in total eleven photographic societies in South Africa and just two elsewhere in the continent, at Constantine and Oran, Algeria.

In comparison with photographs taken by colonial officials, scientists and amateurs, commercial photographers catering for a European market for travel photography that had greatly expanded by the 1880s, created less authentic images of Africa and its peoples. Large photographic companies operating in sub-Saharan Africa, such as Naretti (Abyssinia), Lazarus (Mozambique) and Harris (South Africa), produced appealing, saleable photographs by carefully staging subjects to adopt certain poses and wear 'typical' clothes and ornaments. Their manipulated representations contributed further to a stereotype of Africa and Africans. In the nineteenth-century photography's relation to sub-Saharan Africa was predominantly as a transmitter to the outside world of a view of the continent that was anything but unbiased and informs prejudices to this day.

Anne-Marie Eze

See also: Africa, North (excluding Egypt and Palestine); Anthropology; Egypt and Palestine; Ethnography; Expedition Photography; Survey Photography; Imperialism and Colonialism; Royal Engineers; Travel and Exploration; Herschel, Sir John Frederick William; Piazzi Smyth, Charles; and Stone, Sir Benjamin.

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AFRICA, NORTH

Photography in the countries of North Africa—present day Algeria, Morocco, Tunisia, Syria, and Libya—may logically be considered separately from photographic practice in the Near East—the Holy Land and Egypt—in the nineteenth century. The number of visitors to Egypt and the Holy Land—initially explorers and antiquarians, followed by travelers extending the Grand Tour, and ultimately tourists lured by package tours and a highly developed tourism industry—accelerated and amplified photographic activities in those areas. Other regions of North Africa experienced the arrival of photography in the hands of European travelers and the subsequent establishment of indigenous commercial photographic studios at different paces.

The earliest photographers of North Africa were motivated primarily by the documentary interests of architects, antiquarians, and archaeologists who focused initially on Greco/Roman ruins. The site of Baalbek in present day Lebanon was photographed frequently by visitors and commercial photographers; a list that begins with Joly de Lotbiniere (1839) and Gerault de Prangey (1842), followed in short order by Maxime DuCamp (1850), and later commercial photographers such as the Bonfils Studio. Lerebours' *Excursions Daguerriennes* (1841–44), the first book with engravings

from daguerreotypes included views of Algiers, Beirut, Damascus, and Baalbek.

For the French, an interest in the architectural patrimony of France begun under the Commission for Historic Monuments and photographed by the *Missions Heliographique* extended to expeditions to document the remains of the line of castles built by the Frankish Kingdoms following the Crusades. In 1859-60, and on a second journey (1862–63), Louis De Clercq (1836–1901) accompanied historian Emmanuel-Guilluame Rey and photographed Crusader castles in present day Syria, Lebanon, and Libya. His work is contained in six albums of 222 photographs, entitled "Voyage en Orient," which also included volumes devoted to Egypt, Jerusalem and Palestine, and Spain. As part of his multi-volume studies of architecture, Pierre Tremaux photographed throughout Asia Minor and North Africa including Tunis and Tripoli. In Aleppo, Albert Poche (1842–1930) photographed archaeological sites, the castles of the Crusaders, and ancient Christian churches from Aleppo and northern Syria. By the 1860s there were a number of photographic studios in Beirut and Damascus. The Bonfils studio (1867–1918) in Beirut was responsible for one of largest bodies of photography of the Near East including North Africa. Georges Saboungi established a Beirut studio in 1863 and published technical papers and manuals in Arabic. And Suleiman Hakim's studio in Damascus in the 1870s produced both tourist views and portraits.

The French colony of Algeria—the north came under French domination in1830 and the French extended control to the south in the following decades—and its capital city Algiers, only a day's journey from Marseilles, received large numbers of colonial administrators and visitors. Photographers documented the colonial apparatus, as well as archaeological sites. Delamotte and Alary made daguerreotypes of Meddea and Biskra in 1850. The young photographer and archaeologist John B. Greene photographed in Constantine and accompanied an 1856 expedition to excavate the ancient tumulus tomb known as the Tomb of the Christian. He made a series of photographs that thoroughly documented the mound prior to its excavation. The Parisian commercial photographer Felix Moulin, visiting Algeria at the same time, reportedly made photographs with the expedition, although those photographs have yet to be found. Moulin placed in commercial release a number of photographs which documented the colonial presence in Algeria, scenes from Bedouin life, and a number of erotically charged photographs of dancing girls that answered an avid market for Orientalist fantasies of the harem. The latter continued the subject and treatment of photographs that he had staged in his Parisian studio and offered as studies to artists. Charles Marville (1816–1880), after completing the commission to document the changes to Paris under Baron Haussman, photographed the colonial and urban fabric of Algeria.

The erotic fantasies of the Orient supplied by Moulin were elaborated by local studios later in the century and can be read as a statement of colonial control. Malek Alloula's (1986) critical study of the cabinet cards and later postcards that constituted an entire class of colonialist images in Algeria is a landmark in post-colonial studies. Alloula's work examined the vernacular images of semi-nude, erotically posed Algerian women within the context of colonial systems of power and control. The hundreds of photographs in circulation from the 1880s on indicate they number of commercial studios participating in their creation.

Extensive photography in Tunisia, Morocco, and Libya was delayed relative to that in Algeria or the coastal regions. Tunisia was generally considered an extension of Algeria, although without a French garrison stationed there until late in the century it was considered less stable and thus was visited less frequently by the casual traveler. A full-blown trade in images for tourists, as exemplified by the volume of views of Tunisia published by Cairo booksellers Lehnert and Landrock, *Picturesque North Africa*, 1900, did not emerge until the end of the century. Morocco, more closely associated with Spain than France, also emerged as a photographic site late in the 19th century. Moroccan views were frequently appended to collections of views of Moorish Spain, such as those by August Jacob Lorent. The photography of Libya followed a bifurcated path. The great Greco-Roman ruins near Tripoli—Leptis Magna and Sabratha—were frequently included in the itinerary of archaeologist/photographers, De Clerqc for example, but exploration further inland was limited. The first major expeditions to be photographed were those made by of Gerhard Rohlfs. A 1869 expedition along the Libyan littoral was photographed by Emil Salingre. Rohlfs himself photographed the 1873–74 expedition to which traveled between oases in the Libyan Desert (*Drei Monate in der Libyschen Wuste*, 1876). The occupation of Libya by Italian forces at the beginning of the twehtieth century provided the impetus for the first major photographic survey and archive of Libya accomplished by Luca Comerio (1878–1940).

KATHLEEN STEWART HOWE

See also: Lemercier, Lerebours and Bareswill; Bonfils, Fèlix, Marie-Lydie Cabanis, and Adrien; Rey, Guido; de Clercq, Louis; Delamotte, Philip Henry; Orientalism; Marville, Charles; and Lorent, Jakob August.

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AGFA

AGFA is the acronym of "Aktiengesellschaft fuer Anilinfabrikation" (stock corporation for anilin fabrication) composed at the union of two chemical companies in 1873: The chemical corporation Dr. Jordan in Berlin which produced potassium ferricyanide since 1850, and the "Society for Anilin Fabricates" founded by Carl A. Martius and Paul Mendelsohn-Bartholdy in 1867, as well in Berlin. The acronym was not in use before 1897 when it was made a trademark with the logo that lasted to the very end of the company in 2005. AGFA's photographic history began in 1887 with the installation of a photographic department under Dr. Momme Andresen, a chemist who gained three patents on developping agents within four years: in 1888 for Para-phenylene-diamine, in 1889 for Eikonogen, and in 1891 for Paramidophenol. The same year 1891 saw three more patents for Andresen and the company, and it marked the beginning of the production of "Rodinal," a developper in practical use for more than a century. In 1892, the company and Andresen launched the first fixing agent that only had to be dissolved in water. The instant success of all these substances instigated the company's concentration on photographic materials, and in 1893, Momme Andresen succeeded in establishing the production of dry plates. In 1895, these plates were undergoing substantial development by the addition of an anti-halation layer after a patent by Otto Magerstaedt. The "Isolar" plate was such a success that the final AGFA acronym and logo had to be launched in 1897, a year before the production of celluloid-based films was started. By 1899 the AGFA was able to offer roll films in sufficient lengths for film productions. The production of film rolls brought AGFA into competition with Eastman Kodak and the Lumière brothers but the production quality suffered from the steam of a nearby railroad line in Berlin; several areas were tested until the final move of the company to Wolfen in 1909. By this time the production of synthetic colours for which AGFA had been founded was completely abandonded.

In 1896, the optician A. Heinrich Rietzschel founded a manufacturing company for optical devices in Munich; in 1900, it began to produce cheap cameras for amateurs. In 1921, this company was bought by the "Chemical Company hitherto known as Friedrich Bayer" in Leverkusen which had installed its own production line in photographic films and papers by taking over Eduard Liesegang's establishment in Dusseldorf in 1904. With the installation of "I.G. Farben" (Industrial Society in Colours) as the union of Bayer, BASF, and others chemical companies, AGFA was made the prime photographic branch of this group; Rietzschel began to market its cameras under the AGFA branding in 1927. Between 1927 and 1945, AGFA was the biggest photographic manufacturer in Germany. With the destruction of "I.G. Farben" in 1945, AGFA was made a company of its own, to be united in 1964 with the Gevaert holding, set up in Antwerp in 1894 by Lieven Gevaert; at the same time the Perutz company was made part of the new holding and seized to exist as a trademark of its own.

ROLF SACHSSE

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AGNEW, THOMAS AND SONS

English art dealer, publisher, and patron

The Agnews were well established Manchester art dealers and print publishers long before their involvement with Roger Fenton and the photography of the Crimean War. The company regularly commissioned work from the leading artists of the day. Examples included the Lake District artist J.B. Pyne in 1853 and the Crimean War artist Thomas Jones Barker in 1855.

William Agnew (later Sir William) was already acquainted with Fenton when the idea of sending a photographer to the war was first mooted, the art dealers became involved in the project because they could see the commercial potential of such a series of images. Agnew's decision to engage Fenton pre-dates the often-quoted reports by William Howard Russell which had caused considerable disquiet when published in the *Times* in November and December 1854. Agnew's investment in the project was considerable, and due to the time taken to publish the works after the war, their return was limited.

In September 1855, the works were exhibited at London's Water Colour Society, and William Agnew and Fenton travelled to Osborne to present a set of prints to Queen Victoria and Prince Albert, and to St. Cloud, Paris to show them to Napoleon III. In 1858, the Agnews published albums of photographs by Caldesi and Montecchi

of the Manchester Art Treasures Exhibition of 1857, in collaboration with P&D Colnaghi.

John Hannavy

AGUADO DE LAS MARISMAS, COMTE OLYMPE-CLEMENTE-ALEXANDRE-AUGUSTE (1827–1894) AND VICOMTE ONESIPE-GONSALVE (1830–1893)

The brothers, Olympe and Onésipe Aguado de las Marismas epitomize the body of amateur enthusiasts in the early 1850s who reveled in exploring the potential of photography. Of the two brothers, Olympe was without question the one who was most involved. Their father, Alexandre Aguado, marquis de Las Marismas del Guadalquivir, born in Spain, had become one of the richest bankers of aristocratic Paris and one of the figures of the Restoration and the monarchy of July. After having fought the Napoleonean armies, he left Spain to emigrate to France and was naturalized in 1828. About 1810, he married Maria de Carmen Victoire Moreno, Spanish like him. They had three sons: Alexandre, Olympe and Onésipe. Olympe Clémente Alexandre Auguste Aguado was born on February 3, 1827 in Paris and his younger brother Onésipe on May 9, 1830 in Evry. With the death of their father in 1842, a considerable fortune as well as many vacation resorts were bequeathed to the three sons. The life of Olympe Aguado, like that of his brother Onésipe, was divided between socialite activities, family intimacy and photography.

The reasons that pushed Olympe, and to a lesser extent his brother Onsésipe, whose activity was much more limited, to practice photography were, as was the case very often within the confines of noncommercial practice, difficult to define. A favorite recreation of distinguished and wealthy people, photography became for Olympe an occasion to affirm the artistic sensitivity acquired from father. According to surviving records from 1848–49. Olympe Aguado was introduced to photography at the same time as Vicomte Joseph Vigier, and like many amateurs in paris at the time, learned the rudiments of photography from Gustave le Gray.

Aguado's beginnings as a photographer remain associated with the daguerreotype, however there is only one plate testifying that he used this process [*Intérieur d'un hôtel particulier*—Paris, Société Francaise de Photographie]. According to the testimonies provided by the critic Ernest Lacan, others' works cunducted using the daguerreotype attest to the beginnings of a regular and varied practice. Parallel to the use of the daguerreotype, it seems that in 1850 Aguado attempted the new technique of negative paper as shown in *Composition avec outils de jardinage* (Composition of youth with tools for gardening) which is preserved at the Getty Museum

Aguado, Onésipe. "Woman Seen from the Back."
Courtesy: The Metropolitan Museum of Art, Gilman Collection, Purchase, Joyce F. Menschel Gift, 2005 (2005, 100.1) image. © The Metropolitan Museum of Art.

in Los Angeles. Lastly, probably around 1850 or 1851, Aguado practiced collodion on glass specifically adapted for portraits and instantaneous photographs. Olympe Aguado had rather quickly acquired the knowledge of the principal through varied practice. Olympe Aguado's production increased significantly from 1853–1854. In addition to the two principal techniques that he used, negative paper for the landscapes, and collodion on glass for portraits and images of the like, he increased the frequency of his technical experiments, and regular exposures as part of being an active emmber in the new Société Française de Photographie.

One of the least-known aspects of the career of Olympe Aguado is without doubt, the role of experimentation that he had with the emergence of new photographic processes. It is indeed he who, in 1854 and in the company of Edouard Delessert, developed the invention of the carte-de-visite, which was eventually patented the same year by Eugene Disderi. In the carte-de-visite format, Olympe Aguado even created a certain number of self-portraits along with portraits of his close relatives and an imperial couple, as well as various indoor scenes. According to writings of the time, he was also involved in some of the first attempts at photographic enlargement in which he carried out some spectacular images; unfortunately there remain no known examples to date. He also had an important role to play in the formation of

the Société Française de Photographie, which he joined in 1854 as a founding member.

What has reached us of the photographic production of the two Agaudo brothers is, as in many cases, certainly quite less than all they produced. The diversity of the results is, however, enough to measure the extent of the subjects they confronted: deserted interiors, studies of trees, pastoral scenes, dramatized portraits and vibrant scenes, reproductions of works of art, and lastly snapshots of sailboats. It is difficult to determine chronologically the list of these images. It is believed though, that they were taken simultaneously at meetings and other places in one or around their many properties throughout Frances territories. Regarding the diversity of the subjects in these images, it is necessary to emphasize the two brothers' originality as undeniably expressed in these images.

A series of portraits is for this reason exemplary. From the years 1852–1853 the two brothers arranged a workshop in their apartment in the Place Vendôme in Paris where they carried out a series of portraits in front of painted canvasses, anticipating the use of decorative elements which would dawn on the Parisian commercial studios under the Second Empire. In 1853, parallel to the series of portraits, Olympe Aguado launched out in an important series of scenes that he carried out for the most part on his property of Grossouvre, located in the county of Cher. Among them were images of farm animals, but also of scenes of carts and cattle drivers copied on the compositions of animals that can be found at the same time in works by painters like Constant Troyon or Rosa Bonheur. During this period, Aguado started his studies of trees, underbrush and edges of rivers which he continued throughout the 1850s. On this occasion he is revealed as one of the more enlightened landscape photographers of his generation, drawing still from the pictorial model the sources of its compositions. But the originality which, without question, distinguishes the Aguado brothers from the remainder of their contemporaries, appears in the few surviving images that they created at the end of their photographic careers, at the end of the 1860's. By subtle staging the Aguado brothers regulated all the details and they reconstituted, with the assistance of characters, a series of fascinating images of their family. Thus *Admiration!* [Musé d'Art moderne et contemporain de Strasbourg] with aspects of *La Lecture* [Musée d'Orsay], *Jeu de Solitaire* [private collection] or even *L'album de photographies* [collection Maurice Dussartre, Paris] form an elegant but bitter criticism of the mores of the Second Empire which falls under the tradition of the visual satires of middle-class problems then in vogue in the French press, or the caricatures of Honore Daumier.

The mid-1860s marks the end of the photographic career of the two brothers. The Getty museum has preserved an album from 1866 in which appear a certain number of small prints in albumen attributed to Olympe and Onésipe and whose subjects—small pastoral scenes carried out in the family circle—announce the formal vocabulary of instantaneous photography. Undoubtedly the multiplication of the regular commercial practices of photography and the renewal of occasional photographers are not inconsistent with the gradual disinterest of the two brothers in a practice that they approached in an indifferent way and outside of any normative prescriptive framework. The younger brother, Onésipe, died in Paris on May 19, 1893, followed one year later by Olympe who died in Compiegne on October 25, 1894.

Denis Canguilhem

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AHRENDTS, LEOPOLD (1825–1870)

German photographer

Leopold Ahrendts, born Friedrich Leopold in Dessau on 16 June 1825 to master plumber and subsequent factory owner Leopold Friedrich Heinrich Ahrendts and his wife Caroline, worked first as a painter and lithographer in Dessau, before moving to Berlin around 1850 where he presented lithographs at the Academy of Arts Exhibitions of 1850 and 1852. In 1856 he began work at the portrait studio of court photographer Philipp Graff's widow, a studio later acquired by August Beer. Ahrendts is best known for his photographs of Berlin views and architecture. He also documented the urban transformation in events like the laying of the foundation stone of Berlin's Town Hall on 10 June 1861. In 1865 he exhibited his city views at the "Erste Internationale Photographische Ausstellung" [First International Photographic Exhibition] under the name of the Graff Studio, for which he continued to work until his death on 19 March 1870. His photographic work is preserved in a portfolio "Berliner Ansichten" [Berlin views] in the Berlin Staatsbibliothek, in the Stiftung Stadtmuseum Berlin and in the Berlinische Galerie Photographic Collection.

Stephanie Klamm

ALBUMEN PRINT

Albumen printing paper was the medium of choice for the majority of photographic printers for more than thirty years following its introduction in the mid 1850s.

Showing exceptionally fine detail and the longest tonal range of nineteenth century processes, albumen dominated the field until the rise of emulsion-type gelatin and collodion papers from the late 1880s. Because of its unique qualities, however, it remained in widespread use until the closing years of the century.

The use of albumen in photography can be traced to the anonymous 'H.L.' who proposed the method in the May 1839 issue of *Mechanics Magazine*, but never provided further details. The man generally credited with the invention is Abel Niépce de Saint-Victor, who conceived the idea of making photographs on glass and reported his experiments in *Comptes Rendus* in June 1848. His albumen on glass negative process offered very fine detail, but a sensitivity which imposed long exposures on its users and thus restricted its use.

Searching for improvements to the salt-paper printing process, where the image was carried within the upper thickness of the paper, Louis-Désire Blanquart-Evrard added chlorides to albumen thus containing the light sensitive chemistry within a surface coating, a major factor in the fineness of detail for which then paper became renowned. The coating of albumen also helped protect the silver salts from the corrosive effects of air, and was believed to offer the potential of great stability for a correctly processed print than offered by the salt-paper process. In fact the effect of residual sulphur in the egg-white actually left the untoned albumen print more prone to discolouration and fading.

Blanquart-Evrard presented his discovery to the French Academy of Sciences on 27 May 1850. In 1851 he opened a printing company in Lille for the mass production of photographic prints, a mechanisation not possible with comparatively fragile salted-paper.

At this time the majority of prints were exposed until the image reached the required density by the action of light alone, before being fixed, washed and dried —a very slow process. Blanquart-Evrard's technique of developing prints instead of the conventional printing out process led to a much faster output of prints. Photographers were quick to try out this new method for positive prints and it became an almost instant success. Edouard Baldus and Roger Fenton, amongst others, found the sharp definition of albumen paper to be ideal for architectural photography.

Blanquart-Evrard's original formula for the preparation of albumen paper was white of egg beaten to froth with 25 per cent by weight of a saturated salt solution. The mixture was allowed to settle overnight. A sheet of paper was then immersed in the solution. The dried paper was not light sensitive and would keep indefinitely in the albumenized condition.

After drying, the albumenized sheet was sensitized to light by being immersed in or brushed with a silver nitrate solution. The paper was then exposed to sunlight

Emonds, Pierre. Maison, rue Saint-Paul.
Courtesy: The J. Paul Getty Museum, Los Angeles. © J. Paul Getty Museum.

for several minutes or hours—the length of exposure depending upon whether the print would subsequently be developed or not. The resulting image was rinsed, usually toned with gold, fixed, and then rinsed again. If the prints were not completely divested of their salt fixing agent, sodium-thiosulphate, they were very likely to fade or bleach out.

Since silver prints are extremely sensitive to any chemistry that includes sulphur or its compounds, exposure to the sulphurous atmosphere of industrialized cities in the 1850s and 1860s was potentially damaging to the photographs. In May 1855, the Photographic Society of London (later to be the Royal Photographic Society) established a committee to examine the fading of positive prints. The results of the investigation cited sulphur and moisture as the prime causes of photographic fading but claimed that proper care and conservation could make silver prints last indefinitely.

The earliest albumen prints appeared reddish brown or chocolate brown in color, while later ones are usually warm brown, purplish brown, purple, or purplish black. Approximately 85 percent of prints show some readily noticeable yellow stain in the whites and highlighted areas. The presence of highlight yellowing and

characteristic surface texture are two of the most readily apparent and reliable indicators that a given print is an albumen print. Another indication of albumenized paper is a surface texture that may possess a "crackled" appearance. Prints of the period 1850–1870 are usually less glossy than those of the period 1870–1890 because of the use of burnishing and rolling machines to smooth the prints after mounting and the increased use after 1870 of double-coated paper. A very large percentage of the albumen paper produced during the period 1870–1900 was tinted various shades of pink, purple, and blue by adding aniline dyes to the albumen before coating it on the raw stock. The first such paper appeared on the market in 1863 and attained great popularity in the 1870s and 1880s. Tinted paper was mainly used for portraits and pink was the most popular shade. Because the dyes used had poor stability to light, most of the dyed paper is difficult to recognize today. In some cases, although nothing remains of the original tint, a peculiar buff or chamois coat identifies albumen prints originally made on tinted paper.

Albumen became a favored process because it produced a glossy print and many photographers experimented with the procedure to yield an even shinier image. Many experimenters discovered that partially decomposed albumen yielded a glossier and more even coating. Decomposed albumen passes into an acid condition and forms a homogenous mixture without the uneven viscosity and stringiness of egg white. Some albumenizers went so far as to actually allow the albumen to naturally ferment at elevated temperatures for several days to achieve the desired effect. This technique later became standard practice in the Dresden, Germany factories which, beginning in the early 1870s, supplied the majority of the world's albumen paper.

Close to the sources of raw stock and enjoying an abundant supply of low-cost eggs, Dresden Germany became the center of world production by 1870 because it also had the advantage of lower labor costs than English or American competitors. The procedure of albumenizing paper began with the freshest available eggs—only clear white was saved without slightest contamination from the yolk, blood, or stringy tissue known as the chalazae. The whites were heated to froth with the approximate amount of ammonium or sodium chloride (ammonium chloride was most commonly used in the nineteenth century). The amount of chloride used had a definite relation to the sensitivity and to a small extent the contrast of the paper. Papers with a low (1-1.5 per cent) chloride content showed less sensitivity.

Workers, generally women, would fill a tray to a depth of approximately two-thirds to three-quarters of an inch with the albumen solution and float the paper on the surface for 1 and a half minutes. Only one side of the paper would be coated before drying and, if dried quickly at a high temperature, the result would be glossy. In the nineteenth century, temperatures of 30–50 degrees Celsius were maintained. The sensitized and dried sheets of albumen paper were then hung in a closed box and subjected to the vapors of ammonia. The fumes were supplied by placing strong ammonia in a dish in the bottom of the box. The process continued for 5–10 minutes and its purpose was to make the paper more sensitive and to obtain richer, more brilliant prints. Although fuming formed a common part of the American process, it was rare in Germany. Tedious to produce and slow to develop, albumen paper disappeared as a commercial article in 1929.

Caryn E. Neumann

See also: Fenton, Roger; Baldus, Édouard; Blanquart-Evrard, Louis-Désiré; amd Photographic Exchange Club and Photographic Society Club, London.

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ALEXANDRA, QUEEN (1844–1924)
English photographer

Queen Alexandra of England, christened Alexandra Caroline Marie Charlotte Louise Julia Oldenburg, was born on December 1, 1844 in Copenhagen to Prince and Princess Christian of Glucksburg. She married the Prince of Wales on March 10, 1863. Her parents acceded to the throne of Denmark as King and Queen Christian IX later that same year. At this time, Princess Alexandra became involved in charity work and philanthropy in Britain and also began to take photographs. Her pictures were first exhibited at a Kodak exhibition in London in 1897, and she later participated in two more exhibitions at Kodak Galleries. After her husband was crowned King Edward VII in 1902, the Daily Telegraph of London published *Queen Alexandra's Christmas Gift Book, Photographs from My Camera* (1908). The book included 136 snapshots taken, selected and captioned by the Queen herself. It presented the public with informal

pictures of the Royal Family and photographs from the Queen's travels. The majority of the photographs were taken in England, Denmark, Greece and Norway. Proceeds were donated to over thirty different charities. Queen Alexandra died on November 20, 1924, fourteen years after the death of her husband, and was survived by four of their five children.

ANDREA KORDA

ALINARI, FRATELLI

Italian firm operating since 1854 to the present day

The firm of Alinari Bros was founded at Florence in 1854 by the brothers Leopoldo (1832–1865), Giuseppe (1836–1890), and Romualdo (1830–1890). Leopoldo had already been working for a number of years as an apprentice of the chalcographer Luigi Bardi. In the first half of the nineteenth century Bardi's firm had produced photographic views of Florence in addition to the traditional copper engravings. These were the years in which copper engraving was giving way to photography, which was cheaper and therefore more accessible. Bardi's views bore the blankstamp "Luigi Bardi Firenze," and today they are attributed to Leopoldo Alinari, who learnt his photographic technique from Bardi. Some of Leopoldo's views were printed in Eugène Piot's *L'Italie monumentale*, which was published in Paris in 1851. Bardi continued to encourage Leopoldo and got him to open a shop next-door to his in Via Cornina (today Via del Trebbio) at Florence, to sell pictures to tourists. From 1854 onwards the pictures sold in Leopoldo's shop bore the stamp "Fratelli Alinari/Fotografi/Firenze/presso Luigi Bardi" (Alinari Bros/Photographs/Florence/near Luigi Bardi's), a sign of Leopoldo's continuing collaboration with Bardi.

Later Leopoldo was to have the main part in the organization of the firm and in deciding its cultural policies; Giuseppe supervised the technical aspects, and Romualdo was involved in the administration. The first known printed catalogue, printed in French in 1856 (*Collection des Vues Monumentales de la Toscane en Photographie par les Frères Alinari*, Florence, Louis Bardi, Avril 1856) shows that initially production was concentrated on views of monuments and panoramas of cities in Tuscany, in particular of Florence, Pisa, Siena and Arezzo. Some of these views were exhibited at the Exposition Universelle, Paris, in 1855, where the Alinaris won second prize and thus qualified as one of the important firms of photographers in Europe. In an exhibition at Brussels in 1856 they won the gold medal.

For the negatives they used the collodion process. They devoted their attention to portraits and, from 1858, specialized in reproductions of works of art, achieving excellent results. Their first photographic campaign in this area was in 1858 and it concentrated on fifty drawings in the Uffizi at Florence . The photographs made a great impression and were praised by eminent scholars including John Ruskin. He extolled their descriptive clarity and precision, qualities which thenceforth were the unmistakable hallmarks of Alinari production. In the same year Queen Victoria's husband Prince Albert commissioned the Alinaris to reproduce Raphael's designs in the Accademia di Venezia and in the private collection of Archduke Karl in Vienna. These three pieces of work were greatly admired, and Luigi Bardi published them in a single volume (*Disegni di Raffaello e d'altri maestri esistenti nelle gallerie di Firenze, Venezia, e Vienna riprodotti in fotografia dai Fratelli Alinari*) (*The drawings of Raphael and other maestri in the galleries of Florence, Venice, and Vienna photographically reproduced by Alinari Bros*). Of these three enterprises there remain today some negatives in the Alinari archives at Florence, and these, together with some family portraits, form the oldest nucleus of the firm's photographs that exists today. In 1861 the Alinaris took part in the Esposizione Italiana, Firenze, showing views and portraits of the royal family. By now the Alinaris' fame was such that they had been invited

Alinari, Fratelli. Moise by Michael Angelo, central sculpture of the Tomb of Julius the Second.
Courtesy: The J. Paul Getty Museum, Los Angeles. © The J. Paul Getty Museum.

to photograph the ruling house of Italy. In 1863 they opened a new shop in Via Nazionale 8 (today Largo Fratelli Alinari) and, when Florence became the capital of Italy, in 1865, their business grew.

Leopoldo died on the 9th of November 1865, and the firm carried on under Giuseppe and Romualdo. In September 1865 the *Catalogo generale delle fotografie pubblicate dai Fratelli Alinari di Firenze* (*General Catalogue of the Photographs published by Alinari Bros of Florence*) came out, and it included reproductions of drawings of the Uffizi, Venice and Vienna in different formats, stereoscopic views and portraits. The firm specialized in the production of negatives on large-sized glass plates, up to 105 by 76 cms. In 1873 a new catalogue came out with variations and additions, in which were mentioned the main shop in Via Nazionale, the new depositories in Via dei Tornabuoni 20 and the premises which had been opened in Rome, in Via del Corso 90. The firm had a well-organized plan for the photographic documentation of the whole of Italy, with particular emphasis on art collections and the principal works of art. In Florence they took new photographs of the frescoes in the sacristy of San Miniato, and of those in the choir and sacristy of Santa Croce. Appendices to the 1873 catalogue came out in 1876, 1881 and 1887. In the appendix of 1881 it is stated that up to that moment the firm had produced 12,945 negatives, and had gradually replaced collodion negatives with gelatine ones. The firm obtained recognition at many exhibitions: Vienna 1873, Paris 1878, Milan 1881, Turin 1884. At the Exposition Universelle, Paris, in 1889, they won the gold medal.

In May 1889 the Società Fotografica Italiana was founded. From the beginning, also through its "*Bullettino*," it has been the means by which the state of photography in Italy can be assessed, and problems regarding photographers rights and copyrights of photographs can be sorted out. In February 1890 Vittorio Alinari (1859–1932), the son of Leopoldo, and his uncle Giuseppe joined the Society. Both became leaders in the debate about Italian photography, and the "*Bullettino*" of the Society published several of their articles and photographs.

In 1890 the brothers Giuseppe and Romualdo died within a short time of each other. Vittorio then took over the direction of the firm. Under him its photographic production was widened to include all aspects of the Italian countryside, costume, and life in the cities. They reorganized their material and replaced many old negatives with more recent ones; from 1892 all were renumbered. They also published tourist guides and volumes about art. In 1893 a new catalogue was devoted to Florence, Umbria, and Rome. In 1894 they published a work on Venice and the Veneto. In 1892 they photographed the frescoes in the Raphael rooms in the Vatican, for which they used isochromatic negatives. In 1899 they completed the set of photographs of the Sistine Chapel which they had started between 1876 and 1880. The extremely high quality they obtained, considering objectively the difficulties of execution, marks an important milestone in the firm's photography of works of art. The Alinaris now sold to a vast public, from the most eminent scholars, especially those of the history of art, to wealthy foreign tourists. In 1899 they also took part in an exhibition of the Società Fotografica Italiana at Florence. They expanded their portrait section, where the main specialist was Mario Nunes Vais (1856–1932). He was one of the few photographers of the firm to put his own initials on his photographs. He executed splendid portraits, which show great sensitivity in their composition, and some were published in the famous magazine *La Fotografia artistica*. From the beginning of the twentieth century, the firm expanded its colour section, and its photographs of works of art were highly praised for their quality and fidelity to the original.

After the death of his son Carlo in 1910 and the outbreak of the First World War, Vittorio reorganized the firm's activities. In 1920 he sold out to a group of Florentine businessmen whose head was Baron Luigi Ricasoli Firidolfi. The firm continued with new enterprises and changed its name to "Fratelli Alinari I. D. E. A. (Istituto di Edizioni Artistiche)" ("Alinari Bros I. D. E.A. Institute of Editions of Art"). Vittorio continued, however, with his photographic work, and opened a shop in Via Strozzi specializing in art publishing, the Vittorio Alinari editions. In 1921 he edited *Paesaggi Italici nella Divina Commedia* (*Italian Landscapes in the Divine Comedy*), printed by Giorgio and Piero Alinari. Many of the photographs in this book are the result of a long and dedicated research into the Italian countryside, which Vittorio had carried out in the previous years. These photographs contributed enormously to people's increased knowledge of the Italian countryside and Italian art, through the use of precise expressive codes deriving from the perspective of the Renascence.

Under the direction of Augusto Socci, in the twenties and thirties of the twentieth century, the firm grew and perfected its colour printing and collotypes, thanks also to the photographer Vincenzo Balocchi (1892–1975), who was in charge of the photomechanical division. In 1954 it celebrated its centenary and had branches in all the largest cities in Italy. It acquired the archives of important photographers such as Brogi, in 1958, and, in the sixties, Anderson, Chauffourier, and Fiorentini.

In 1985, on the firm's initiative, the Museo di Storia della Fotografia was opened in Palazzo Rucellai at Florence. In the eighties it acquired the archives of other famous photographers such as Lattuada, Wulz, Trombetta, von Gloeden, Michetti, Zannier, Balocchi, Van-

nucci Zauli. Today the Alinari archives are in Florence, Largo Alinari 15. Here are kept about 780,000 original photographs by Italian photographers and those of other nations, as well as old photographic equipment.

SILVIA PAOLI

See also: Ruskin, John; and Victoria, Queen and Albert, Prince Consort.

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ALLEGORICAL PHOTOGRAPHY

The presence of a specifically allegorical photography in the nineteenth century has been the subject of a great deal of attention since the late 1970s, even if the aesthetic category of allegory has not always figured in the debates in question. Oscar Rejlander, Julia Margaret Cameron and, perhaps, William Lake Price produced self-consciously allegorical images; it has also been argued that, works by William Henry Fox Talbot, Louis-Jacques-Mandé Daguerre and Hippolyte Bayard are best understood allegorically.

Allegory is the subject of extensive theoretical debate and is not easy to define; nevertheless, two key features can be isolated for our purposes. Firstly allegory is a 'twice-told tale,' in which a literal, or explicit, level of representation is accompanied by a second, implicit, meaning. In order for there narrative content to be legible, allegorical images frequently require knowledge of some prior representation (the Bible, Romantic poetry, etc.). Secondly, allegory is typically contrasted with, another aesthetic category, the 'symbol': whereas symbols are said to convey meaning immediately, allegories unfold over time; the symbol is usually seen as an organic whole, whereas allegory contains a gap, or disjunction, between the literal depiction and the accompanying narrative; the symbol is clear and transparent, allegory is inherently ambiguous. These characteristics sometimes figure prominently in hostile accounts of staged photographs: reviewing submissions to an exhibition by Lake Price and Rejlander in 1856, Robert Hunt suggested: 'They are all wonderfully clever, but after all they are but images of actors posed for the occasion; they all want life, expression, passion...' (Hunt, 'Photographic Exhibitions'). Three years later, the poet and critic Charles Baudelaire made much the same point about French photography. These criticisms draw attention to the fissure between what is actually depicted and narrative allusions in the allegorical picture. The consideration of a particular image will, no doubt, help to put flesh on these bare bones: in Rejlander's double self-portrait: *Rejlander the Artist Introducing Rejlander the Volunteer* (c.1871) the artist at his easel gestures towards the same person wearing military uniform. Seeing the same man in two guises, we recognise that Rejlander was both artist and member of the volunteer movement. However, the literal presence of two Rejlanders is accompanied, at another level of reading, by the suggestion that artist and volunteer equally participate in patriotic defence of state and empire: the artist records and glorifies the deeds of the citizen-soldier, while embodying the values that require defending from the supposed barbarians. Here, the probable date of 1871 is highly significant (figuring as it does the Franco-Prussian war and the subsequent Paris Commune). As an allegorical image Rejlander's picture goes beyond a portrait of a particular man (in two forms), invoking the unity of the middle class in face of both foreign and domestic threat, as well as the solemn duty of the artist. The disjunction between the two characters mirrors the gap between literal and allegorical meaning.

Work of this type was anathema to modernist critics (from Helmut Gernsheim to John Szarkowski), because it went against what they saw as the inherent proper-

Fredericks, Charles DeForest. "Political Allegory with Flowers."
Courtesy: The J. Paul Getty Museum, Los Angeles. © The J. Paul Getty Museum.

ties of the medium. However, the rise of 'postmodern' staged photography associated with Victor Burgin, Cindy Sherman, Jeff Wall and Olivier Richon has led to a revival of interest in this mode of work that, by the later nineteenth century seemed *retardataire*. During the 1980s and 1990s a number of writers argued that at least some early photographs needed to be viewed, not simply as plain transcriptions of things, but as densely textured reflections on the process of representation. Geoffrey Batchen, for example, has argued that Bayard's *Self-Portrait as a Drowned Man* (1840) should be seen as a meditation on his own marginalisation in photographic culture (Batchen, *Burning with Desire*). Carol Armstrong's feminist investigation of the work of Julia Margaret Cameron as an exploration of gendered identity is particularly significant, because, alongside the revival of staged photography from the 1970s, feminist scholarship played a crucial role in this revaluation of 'allegorical photography.' Feminist accounts, like that advanced by Armstrong, stress the performance of gender, arguing that the complex layering of meaning available in staged images enabled women to explore their own ambivalent relation to the cultural conventions of femininity (Armstrong, *Scenes in a Library*). Cameron's work obviously plays a leading role in these debates, but readings of decorative photographic albums complied by aristocratic and bourgeois women could equally figure as examples. Similarly, one account of F. Holland Day, articulated from the perspective of queer theory, puts the weight of interpretation on his coded departure from hetero-normative sexuality (Crump, 'Suffering the Ideal'). Mike Weaver's Christian reading of Talbot provides an account of allegory and photography, which stands as an exception to this theoretical trend. For Weaver, in *The Pencil of Nature*, Talbot produced self-conscious pictures in the emblematic tradition. According to him, *The Open Door* and *The Ladder* (both 1843) are to be understood, not only as everyday images of work at Lacock Abbey, but also as allegorical meditations on the soul's salvation, in which broom, lamp, ladder and doorway all carry long-established Christian connotations (Weaver, 'Henry Fox Talbot: Conversation Pieces').

However, there are problems with these accounts of allegorical photography, only two of which can be raised here. Firstly, it is not easy to distinguish between allegorical images and a photographic art of moralised genre. Whereas Rejlander's *The Two Ways of Life* (1857) and his picture discussed above are intentional allegorical pictures, many of his other photographs conform to the model of 'scenes from everyday life' common at the time. Similarly, while Henry Peach Robinson typically produced genre pictures, *Little Red Riding Hood* (1858) and *The Lady of Shalott* (1860–1) are most probably allegories. There is no stable or clear cut distinction between these aesthetic modes. This distinction is further complicated, because genre pictures can be read for implicit moral, or ideological, content—indeed, this is their point. In fact, almost any act of interpretation entails a second moment of reading in which the literal, or 'denotative,' depiction of things and events is complemented, or overlaid, by implied, or 'connotative,' associations. The second problem revolves around the question of anachronistic interpretation. recent critics often unreflexively project their own values back into the nineteenth century, attributing forms of their own self-consciousness to photographers for whom they were simply unavailable. This is to say, in much of the existing literature there is insufficient attention to the distinction between allegory (images intentionally designed to be read in two registers) and allegorisis (allegorical reading in which the critic generates the second interpretation). Allegorisis is an important critical method—particularly in debates relating to history and identity as they are being formulated at the beginning of the twenty-first century—but it is an approach that foregrounds the interpretive act rather than the initial context of production or first use. This important distinction is often, unhelpfully, elided in discussions of these photographs.

An alternative approach to nineteenth-century allegorical photography might entirely forego the arty, staged image and suggest, instead, that allegorical mean-

ing is to be found in the plain and ordinary image; in the mass of photographic documents and portraits. Images of this type may seem too immediate to be considered allegorically, but in other ways they directly relate to some of the classic features of the allegorical mode. Like allegory, these images are repeatedly described as 'mechanical,' whereas their counterpart, the staged picture, is usually viewed as an 'organic' composition (that is to say, the staged picture might be viewed as a symbol). Futhermore, it is evident that the central allegorical categories of time and death circulate around ordinary record photographs: images produced then, but, when looked at now, frequently induce a typically allegorical moment of melancholic reflection on the passing of time and the all-too transitory character of life.

STEVE EDWARDS

See also: Rejlander, Oscar Gustav; Cameron, Julia Margaret; Price, William Lake; Talbot, William Henry Fox; Daguerre, Louis-Jacques-Mandé; and Bayard, Hippolyte.

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ALLEN, FRANCES STEBBINS (1854–1941) AND MARY ELECTA (1858–1941)

American photographers

The two sisters Frances and Mary Allen, from Deerfield Massachusetts, took up photography in the 1880s after their careers in teaching were cut short by the onset of deafness. Their pictorial images earned them the accolade from one reviewer in 1901 of being numbered amongst "the foremost women photographers in America."

Although the height of their success came in the early years of the twentieth century, the sisters were exhibiting and selling their work by the 1890s—Washington 1896, Philadelphia 1900, Paris 1900, Chicago 1908—their subjects ranging from romantic images of the period buildings in their native Deerfield, to landscapes in the emerging pictorialist tradition, and romanticised groups of local people—especially children—at work and play, their subjects often dressing up in period costumes.

Drawing inspiration from the works of contemporary painters as well as photographers, the Allen sisters created a fine body of rich platinum prints which has, until very recently, been overlooked by historians.

The *Springfield Daily Republican* newspaper in 1901 reported that "The Misses Allen use their camera with the same spirit with which a painter uses his brush, and their sense of composition, of the dramatic moment, is as eminent a qualification for their art as for his."

A major collection of the sisters' delicate platinum prints is held by the Memorial Hall Museum in Deerfield, Massachusetts.

JOHN HANNAVY

ALMA-TADEMA, SIR LAWRENCE (1836–1912)

English patron

Born Lorens, or Laurens, Alma Tadema in Holland, Alma-Tadema as he became known in Britain, was one of the most prolific and successful artists of his day. He was knighted by Queen Victoria in 1899.

His huge output drew much of its inspiration from classical themes, and his work was purchased and exhibited widely.

He was not a photographer, and as far as can be ascertained, he never took a photograph—but he used photography extensively, having evolved, with Belgian photographer Joseph Dupont, a novel application for the medium. Alma-Tadema, concerned about the tonal relationships within his painting, collaborated with Dupont in making photographs of partially completed canvases. Alma-Tadema believed that the reduction of the full colour of the painting to the sepia hues of the

photograph allowed him to assess the composition's tonal balance. However, in 1866, the limited spectral sensitivity of Dupont's wet collodion plates produced a significant tonal distortion which we now know would seriously compromise the results. However, he is reputed to have carried out further work on canvases to improve whatever shortcomings he believed the photographs revealed. Undeterred, he is believed to have used this technique throughout his life.

A copy by Dupont of Alma-Tadema's painting *The Sculpture Gallery*, signed by the artist himself, survives as evidence of their experiments. Whether or not such photographs were offered for sale is unclear, but highly likely.

JOHN HANNAVY

ALOPHE, MENUT ALEXANDER (1812–1883)

French photographer, lithographer, and painter

A Parisian and student of both Camille Roqueplan and Paul Delaroche, Alophe epitomizes the mediocre painter turned commercial lithographer and photographer. From 1838 to 1879, he regularly exhibited paintings at the Salon (second class medal in 1847). A prolific lithographer, he created portraits and sentimental subjects for such publishers as Aubert, and Goupil or for magazines (*L'Artiste*).

Alophe took an interest in photography in 1856, eliciting lessons from Nadar and renting an apartment at 35, boulevard des Capucines, where Gustave Le Gray was already installed. Upon Le Gray's bankruptcy in 1860, Alophe occupied his studio (Nadar arrived in the building that same year). Alophe remained there until 1873, producing portraits and genre scenes in the same vein as his graphic work. He also copied some of Le Gray's portraits and sold them as cartes de visite. He moved to 25, rue Royale in 1874.

Alophe exhibited at the *Société Française de Photographie* (1859, 1861, 1863). Ernest Lacan found his portraits "remarkable" but lacking in "natural" qualities and with too much retouching: "We are not at the Salon" he wrote (*Moniteur de la photographie*, June 15, 1861: 49). Alophe published a treatise, *Le passé, le présent et l'avenir de la photographie*, wherein he advocates photography as high art.

PIERRE-LIN RENIÉ

ALTOBELLI, GIOACCHINO (1814–1879) AND MOLINS, POMPEO (1827–c. 1893)

Studio owners, Italy

Altobelli (born Terni) and Molins (born Rome), originally portrait and historical scene painters, like many others, turned to photographing the tourists sites where 'new' money could be made. They shared a studio in Rome, 1860–1865, producing Vedute di Roma photographs, with their characteristic posed figures, very unusual at the time, and signed 'Altobelli e Molins.' They were also employed as photographers by the French Academy in Rome and by *Opere d'arte per la ferrovie Romane*. The partnership ceased in 1865 and Altobelli, one of the most important of the early Roman photographers, until 1875 ran Enrico Verzaschi's studio on the Via del Corso. Verzaschi was famous for his satirical anti-clerical and anti-royalist photo-montages. Altobelli continued to photograph on his own account. In 1870 he posed soldiers outside the Porta Pia gate to commemorate the breach of the Roman walls in the revolution on 20 September 1870 which marked the end of the Pope Pius IX's rule, in 1878 he documented his funeral. He became also known for his stunning 'Night Views'—a product of the darkroom and the retoucher, for example, 'The Roman Forum by night,' c. 1866, was obviously made for the tourists who had read their Goethe. Molins was commissioned along with others by the British publisher and archaeologist John Henry Parker (1806–1884), founder of the British and American Archaeological Society of Rome, 1865, on his mammoth project which resulted in *A Catalogue of Three Thousand Three Hundred Photographs of Antiquities in Rome and Italy* (1879). Molins acquired most of Parker's negatives on his death but in 1893 his studio burned down and all were lost.

ALISTAIR CRAWFORD

AMATEUR PHOTOGRAPHER

The first issue of the weekly magazine *Amateur Photographer* appeared Oct. 10, 1884. The title speaks to the growing ranks of individuals who took up photography as a hobby or pastime in the 1880s. Smaller cameras, ready-to-use manufactured dry plates, and prepared paper had simplified photography to a point where increasing numbers of men and women could purchase the equipment necessary to make quality photographs with little scientific background and minimal instruction. Photography was seen as a challenging and positive pursuit, and there were many who actively photographed, took part in the numerous local and national societies, aspired to exhibit their photographs, and looked for ways to continue to learn about the medium. *Amateur Photographer* was tailor-made for these enthusiasts. The magazine was pitched to the educated middle class, those with the leisure time and money to photograph. In January 1885 the editors wrote,

> It has been our aim from the first to give to *Amateur Photographer* no mere trade organ, but a journal of

> distinctly literary character. The term amateur implies leisure … our goal is to meet the needs of educated and intelligent readers.

Amateur Photographer aimed to educate and encourage all levels of amateur photographers, including the neophyte. The journal provided articles on technical matters, and every aspect of the photographic process was discussed, from printing techniques to equipment reviews. Readers technical questions were answered each week by the staff in an "Answers and Queries" column, and by 1889 the editor reported that 2000 questions had been answered the year before. The audience was primarily British (including Australia and the British colonies) but questions came in from the United States as well. Each week the journal would publish minutes of the various (and numerous) meetings of clubs and societies in England, and in fact the journal was publicized as the Official Organ of the Amateur Photographic Societies of Great Britain and the Colonies. At various times competitions were held, with the winner's prints published along with a critique of the aesthetic and technical merits of the print. The occasional column "Holiday Resorts and Photographic Haunts," in which contributors would describe a recent trip and the photographs they took, encouraged travel to interesting locales to photograph.

The first editor of the journal was J. Harris Stone. He was a member of and exhibited with the Royal Photographic Society. By 1889, Charles W. Hastings and T.C. Hepworth, well known author of books on lantern slides for amateurs, were joint editors. The journal took up art and aesthetic issues from the start, and the first decade was the site of some of the Peter Henry Emerson/H.P. Robinson debate. In 1893, A. Horsley Hinton, a founding member of the Linked Ring takes over until his death in 1908. The appointment of Hinton is significant; he brings a more ardent interest in fine art photography, and during the next 15 years *Amateur Photographer* becomes the primary journal for the aesthetic photography movement in Britain.

In January 1889 the editor reported that circulation had doubled and he hoped to print 10,000 by the end of the year. The title still exists, and although it has gone through numerous changes in publisher and editor, it still serves the same audience—the enthusiastic amateur.

BECKY SIMMONS

See also: Emerson, Peter Henry; Robinson, Henry Peach; and Brotherhood of the Linked Ring.

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AMATEUR PHOTOGRAPHERS, CAMERA CLUBS, AND SOCIETIES

The history of 19th century photography is dominated by amateur photographers. This designation is not applied in retrospect, very early the literature of photography uses the term self-consciously to distinguish a certain type of practitioner. An amateur's interest in the medium fell outside professional and financial concerns. Some could be considered casual hobbyists, but many made photography an avocation, a serious pursuit to which

they dedicated many hours. The story of amateur photography is a story of influence—influence on the course of technological advances, influence on the art, and influence on the photographic manufacturing industry. No distinction is without its myriad exceptions, so the boundaries blurred at times: a few amateurs eventually turned to making money while some that worked with photography for a living brought an amateurs enthusiasm to the medium.

The two men most associated with the birth of photography, Daguerre and Talbot, can both be considered amateur photographers. In the years immediately following the announcement of the daguerreotype and Talbot's paper calotype process many individuals took up photography who would fall under the classification amateur scientist-inventor. Well into the 1840s, photography called for an individual to have some basic understanding of chemistry. The technology required patience and precision, and was more akin to the experimentation of the scientific process than the technological process of today. Results were not guaranteed. Early photographers were mainly "gentleman," with the education, time and money to take up photography. They were professionals and men of accomplishment in other fields: scientists, doctors, professors, lawyers, clergymen, publishers, as well as artists. Amateur pursuits of all kinds made up part of the culture of the wealthy and educated of the time; men of means and professionals strived to be learned in many areas, engaging in the arts and following and contributing to scientific developments, and photography fit quite well into this well-established tradition, with photographers seeing themselves as part scientist and part artist. Many of these individuals made important contributions to photography, furthering the science, refining technique, and developing applications for the new medium. Some of the names associated with this era, men like Samuel F.B. Morse, Sir John Herschel, Charles Wheatstone, Edmund Becquerel, Sir Charles Eastlake, and Eugene Delacroix formed part of an international cultural and scientific elite of the time.

An important element of amateur practice was communication—in order to learn about new developments and share ideas. Modeled on traditions long established in science and the arts, coming together as a group—for both social and practical reasons—was adapted early on by photographers. Gentleman of mutual interests met regularly for discussion of artistic and scientific matters, print comparison, and development of friendships. In the United States the moral and educational value of photography were also stressed. In the 1840s discussion among amateurs took place informally or within the established scientific community, under the aegis of the Royal Society in Great Britain, the Franklin Institute, and the American Philosophical Society in the United States, and the Académie des Sciences in France. In the early 1850s photographic clubs and associations formed in England, France and the United States, the main centers of photographic activity and many more emerged over the next ten years. The earliest mentioned in the literature is the Photographic Club or Calotype Society, a small group that formed in England in 1847. The membership consisted of influential practitioners in England, including Robert Hunt, Frederick Scott Archer, Dr. Hugh Diamond and possibly even Roger Fenton. In France, the Societé Heliographique, considered the first photographic association, formed in 1851. The Leeds Photographic Society was formed in 1852, and predates the Photographic Society of London (later the Royal Photographic Society), and the Liverpool Photographic Society, both established in 1853; and the Societé Française de Photographie took the place of the Société Héliographique in Paris in the same year. In the United States the American Photographic Society was formed in 1859, and was followed by the formation of the Photographic Society of Philadelphia in 1862. From the beginning these groups were never the exclusive domain of amateurs, they existed to serve all photographers, and consequently a mix of amateurs and professionals, people more interested in science and technology, and artists all came together under one umbrella. Nevertheless, the discussions, centering on technical and artistic matters ultimately served the non-professional more than those that made a living through photography.

The associations and clubs sponsored many activities. Meetings were held regularly, often at a society headquarters that had meeting rooms, a library, and workrooms, providing the space and time for social interaction and discussion of photographic progress. From the time of their founding, the groups sponsored salons and exhibitions. Most of these exhibitions included scientific as well as artistic work, all shown together. The exhibitions received extensive coverage in the photographic literature, and the popular press regularly reviewed exhibitions as well, bringing notoriety to certain photographers and attention to photography in general. Coming together did not necessarily require physical proximity. Print exchanges, the sharing of work among widely scattered individuals was another activity undertaken by small groups or sponsored by clubs and associations and the exclusive domain of amateurs. In England the Photographic Exchange Club was organized in 1855 and conducted an exchange a year over four years. In the United States the Amateur Photographic Exchange Club operated form 1861 to 1863, with members in Pennsylvania and New York. Various arrangements existed, but the basic activity called for each member to distribute their own prints to all the other members at specified intervals,

enabling each person to view a wide range of work and processes. The Amateur Photographic Exchange Club asked that photographs be labeled with a title, date of printing, and process. In return a letter might be sent, with criticisms, questions, advice and perhaps a print, and a personal correspondence would ensue. The general tenor of the exchange clubs was one of congeniality and active sharing of information, more of a recreation than a scientific pursuit.

Communication among amateur photographers became more formalized in the 1850s. Many of these organizations began publishing their own journal, and independent titles appeared as well, all of which functioned as a central distribution point for information to an increasingly far flung membership. In these pages photographers found the texts of papers and transactions of meetings and debates of the societies, articles and news about every aspect of photography, pages where the editor supplied answers to readers queries concerning practical problems, as well as advertisements for equipment and supplies.

While scientific and technical concerns mainly occupied the early amateurs, many saw themselves as artists as well. Particularly in Europe, amateurs worked to have photography accepted as a fine art, on an equal footing with painting and sculpture. Photographers created genre scenes, landscapes, and still lifes, borrowing from accepted traditions in painting and printmaking to make similar subjects and compositions. British photographer Julia Margaret Cameron took photography to a new level of artistry with her staged scenes from literary works and softly focused portraits of cultural luminaries, while in France in the 1850s, amateurs like Charles Nègre and Henri Le Secq, using the paper negative process for artistic ends, created beautiful landscapes and architectural photographs which have been compared to Impressionist paintings.

The growth of the field called for increased specialization and professionalization, and eventually the early amateurs were displaced by trained scientists with an education more focused on photographic chemistry and optics, while manufacturers took over many of the developments and improvements in apparatus and supplies. With the introduction of the wet collodion process in 1851, and its widespread adoption by the 1860s, the field hits a sort of plateau, and photographic methods change only subtly for the next two decades. More and more men and women take up photography as a pastime or hobby, and the number of clubs and societies grows, with groups forming in many major cities. The most important technical contribution by amateurs in this period is the effort to develop a dry plate negative process that did not require sensitization and processing of plates while still wet in the field. Individuals initially experimented with dry collodion, and upon the announcement of a silver bromide emulsion developed by Richard Maddox in 1871, continued using that formula as a basis for their research. The journals of the period are filled with reports of their successes and failures, leading eventually to a commercially viable dry plate process.

A major change in amateur practice occurs in the 1880s. By this time, reliable gelatin dry plates have been developed and mass marketed by manufacturers. The speed of the plates allowed for hand held cameras, and manufacturers came out with "detective" cameras, named after their ability to be used inconspicuously. New, more sensitive printing papers also eased the photographer's burden, and equipment in general becomes less expensive. George Eastman, founder of the Eastman Kodak Company brought about the next important advancement. In the 1880s his company developed a roll holder and flexible film that resulted in the 1888 Kodak camera, which allowed even greater simplification of the process, essentially opening up photography to any level of practitioner. Photography was definitely no longer for the wealthy and the learned but appealed to a broader section of society, allowing people of more modest means and education to take up the hobby. Photography caught the fancy of the late nineteenth century middle-class. People joined clubs in droves, and the number of organizations grew exponentially yet again. As earlier, the clubs served both technical and social needs of amateurs. They usually had offices with meeting rooms, and spaces for dark rooms and printing with communal apparatus. Lantern slide shows by individuals were regularly presented, offering a chance to show personal work and share travels. There is a revival of postal print exchanges in the last decade of the century as well as lantern slide exchanges among clubs. Manufacturers understood the financial power of amateurs, their keen interest in the newest cameras and equipment, and became more involved with their practice. They sponsored contests and marketed heavily to them, fostering a symbiotic relationship. New journals appeared such as the *British Amateur Photographer* and *American Amateur Photographer*, which catered specifically to amateur interests, as well as manuals which brought simpler instructions and a lighter attitude. Women joined clubs which did not allow them previously, and their presence becomes common. The American photographer Catharine Weed Barnes Ward became a spokesperson and advocate for women photographers, and wrote on subjects of interest to amateurs in her many articles in American photo-journals, in particular her column for women in the *American Amateur Photographer*, which she eventually coedited. She published several illustrated books and regularly contributed to journals before becoming coeditor, with her husband H. Snowden Ward, of the British journal *The Photogram* and several other periodicals.

The last decade of the century saw renewed and heightened discussion around the question of aesthetics and art photography. This preoccupation caused a strain among classes of amateurs. Those who considered themselves more serious photographers felt compelled to distinguish themselves from the legions of snapshooters that used a simple Kodak camera to photograph trips, special occasions, and family and friends; they also differentiated their practice from professionals, whose reputation for quality had fallen in recent years. Another, very visible group of amateurs aspired to make more aesthetic photographs, and separated themselves from those more interested in making technically good, but fairly conventional photographs from the standpoint of composition and choice of subject matter. Artistic matters became central to their practice and they took on critical issues of traditional aesthetics and followed certain principles of painting and printmaking. The photographic press also joined the discussion, and journals like the *American Amateur Photographer* advocated taking more time with the artistic side of photography and encouraged their readers to "elevate" their art. The photographs created are variously labeled artistic, expressionistic, or pictorial, the latter term now used to distinguish this particular type of artistic photograph created during the late nineteenth and early twentieth centuries.

The 1890s saw fervent debate over what constituted a pictorial photograph, and whether personal expression and artistry should be emphasized over the cameras ability to record precise detail. Peter Henry Emerson's 1889 book *Naturalistic Photography for Students of the Art*, emphasized selective focusing, which more naturally imitated human vision, with impressionistic compositions that showed an idealized nature. Another group, identifying with the work of H.P. Robinson, emphasized the artistic possibilities of photography through combination printing, traditional principles of composition, and subject matter borrowed from painting. Photographers experimented with old and new printing methods, and processes like gum bichromate and platinotype gained in popularity. Watercolor and other textured papers were used, and negatives and prints were manipulated by hand, allowing for more variation as well as more painterly effects.

Exhibitions and salons continued, many sponsored by the camera clubs and associations. They took on added importance as artistic debates intensify. Splinter groups, devoted to the aesthetics of photography formed in major European cities. The first Photo-Club de Paris formed in 1889. In England photographers protest the lax aesthetic standards of the Photographic Society of Great Britain salon and in 1892 formed their own invitational group, The Brotherhood of the Linked Ring. *The International Ausstellung Kunstlerische Photographie*, organized by the Club der Amateur Photographen in Vienna in 1891, is considered first international photographic exhibition limited only to artistic photography. Subsequent art photography exhibitions were sponsored by The Photo Club de Paris, The Linked Ring in England and the Camera Club of New York, which was founded in 1897. In 1898 the Pennsylvania Academy of the Fine Arts hosted a joint salon with the Photographic Society of Philadelphia with a selection committee consisting of painters and photographers, including Alfred Stieglitz, leader of the fine art photography movement in the United States. The jury chose only works showing "artistic feeling and sentiment," and the exhibition was a popular success. With these exhibitions and formation of aesthetic groups, an international circle of amateur photographers formed the first international fine art photography avant-garde movement. They sought to identify more with the contemporary art world, finding inspiration in Art Nouveau, Symbolism, Impressionism, and contemporary literature: their ultimate dream to raise the stature of photography to the level of fine art —an equal to painting and sculpture.

Amateur photographers, the groups they formed, the publications they fostered, and their contribution to scientific and artistic developments made them the leaders of 19th century photography. In fact, the history of 19th century photography is largely the history of amateur activity. From Talbot and Daguerre to Alfred Stieglitz, many of the most important figures came to photography because they loved the medium; and their devotion can be seen in the many hours they spent experimenting, tinkering, inventing, theorizing, writing, exhibiting, developing, printing, and of course, photographing.

BECKY SIMMONS

See also: Daguerre, Louis-Jacques-Mandé; Talbot, William Henry Fox; Daguerreotype; Calotype and Talbotype; Morse, Samuel Finley Breese; Herschel, Sir John Frederick William; Wheatstone, Charles; Becquerel, Edmond Alexandre; Rigby, Lady Elizabeth Eastlake; Delacroix, Ferdinand Victor Eugène; Diamond, Hugh Welch; Fenton, Roger; Cameron, Julia Margaret; Nègre, Charles; Le Secq, Henri; Maddox, Richard Leach; Eastman, George; Kodak; Ward, Catherine Weed Barnes; Ward, Henry Snowden; Emerson, Peter Henry; Robinson; Photo-Club de Paris; Brotherhood of the Linked Ring; and Stieglitz, Alfred.

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AMERICAN JOURNAL OF PHOTOGRAPHY

The *American Journal of Photography* began publication in New York City as the *American Journal of Photography and the Allied Arts and Sciences* in 1855. The journal was founded by Charles A. Seely, professor of analytical chemistry at the New York Medical School, who had also worked at *Scientific American* before starting the journal. Henry Garbanati, Seely's partner in the photographic chemical business, and a fellow member of the American Photographical Society, joined him as publisher in 1859. Seely edited the journal until 1867.

The bi-weekly journal had a wide subscribership beyond New York City and drew correspondence from a readership of amateurs and commercial photographers across the United States. In 1859 the journal began publishing the minutes of the American Photographical Society; it shared the concerns of the society's founders, among them chemist and physician John W. Draper, his son, astronomer and photographer Henry C. Draper, Henry Hunt Snelling (publisher of *The Photographic and Fine Arts Journal*), commercial portrait photographer Abraham Bogardus, astrophysicist and astronomer Lewis M. Rutherford (who first photographed the moon in 1858), Peter Cooper, founder of Cooper Institute, and Robert MacFArlane, editor of *Scientific American*, primarily with science and photographic chemistry.

Scientists such as John W. Draper had been working on the chemistry of photography even before the advent of the daguerreotype, and in subsequent decades continued to experiment and advance photographic science. Articles explaining and evaluating photographic chemistry, with titles such as "On Washing Gun-Cotton" and "How to Use the Nitrate Bath," complete with chemical formulae fill the journal. The leadership of the society were the most active writers for the journal. Largely chemists drawn from scientific elite of New York City, correspondence in the journal suggests that, in contrast, its readership was either commercial or "practical" photographers or amateurs whose had less interest in the science of photography for its own sake. One such subscriber wrote to the journal that its penchant for debating and publishing multiple chemical formulas and printing instructions were "bewildering" to the point of being "useless."

The journal regularly reported on and evaluated photographic trade manuals published in the U.S. and abroad. Several manuals, including Lake Price's *A Manual of Photographic Manipulation* (London, 1858) and C. Jabez Hughes' *The Principles and Practices of Photography* (London, first edition 1858?) were excerpted or serialized in the journal.

Seely used his "Editorial Miscellany" column as a compendium of observations on the medium in and around New York. Exemplary comments extended from the social uses of the medium, such as his visit to see the city's "Rogue's Gallery" ambrotype portraits of criminals, to gauging public response to new processes such as cartes de visite. Seely frequently noted the relationship between economy and the photographic profession. Seely's commentaries on the state of photography reinforce the scientific point of view expressed by the journal's articles on chemistry. In his view, science, not art, would be the discipline that furthered photography.

In keeping with printing practices of the time, the journal relied heavily on reprints and excerpts from other publications. Notably all the cultural commentary on photography is reprinted from other sources. For example, originally printed in the *Atlantic Monthly*, Oliver Wendell Holmes' "The Stereoscope and the Stereograph," and "Sun Painting and Sun Sculpture" were excerpted in the journal. An appraisal of Brady's photographs of the House of Representatives was drawn from the *New York Daily Times*, and *Scientific American* was also a source for reprints. The journal also reprinted

commentaries, reports and lectures from British and French publications, including *Photographic News*, *The Saturday Review*, and *The Liverpool Photographic Journal*, which was also known as *The Liverpool and Manchester Photographic Journal* and *The Photographic Journal.*

The journal also reported on technological innovation from the United States, Britain and France, in lenses, studio design equipment as well as cameras, and printing techniques. For example, the journal published detailed descriptions, including measurements of the skylight (facing south, fourteen feet square) at Marcus Aurelius Root's former New York studio, are extremely valuable accounts of commercial portrait technology, which, in this case, yielded a sitting of "less than one second with lens at full aperture."

The pages of the journal reveal how many questions about the technology and social implications of photography were debated in the 1850s and 1860s. Questions of invention, ownership and intellectual property, for example, can be traced through the coverage of patent disputes. Along with the two other New York photographic publications, *Humphrey's Journal* and *The Photographic and Fine Arts Journal*, the journal also discussed the social uses of the medium and the appropriate interests and concerns of photographers, split in their ranks between intellectual and educated amateurs and no-nonsense commercial operators. In an 1859 editorial, Seely decried the pecuniary interests of New York's "practical photographers" and noted their absence at Photographic Society meetings. In these discussions of a photographer's ideal, the authentic advocates of the medium were represented as the men of science, who dominated the society, and sought to enrich the artistic reputation of the medium through scientific inquiry. Seely contrasted these elevated concerns with those of men who saw photography only as a business.

Such debates offer rich sources and insights into discussions of the social and cultural purposes that photography should serve in its early decades.

Several important figures in 19th-century American photography contributed to the journal, including the Philadelphia photographer Marcus Aurelius Root, engineer Coleman Sellers, grandson of painter Charles Willson Peale, and chemist M. Carey Lea.

The history of the journal illustrates the precarious nature of the photographic press. In 1860, the journal absorbed *Snelling's Photographic and Fine Arts Journal*; Seely sold his journal in the spring of 1867 but it faltered under new ownership and was absorbed that same year by the competing *Humphrey's Magazine*.

Secondary literature in the history of photography has used the journal to trace the technological and social history of photography. Robert Taft used the trade journals in his 1938 *Photography and the American Scene; in the 1980s and 1990s*, citations to the journal appear in newly contextualized studies of photography's founding figures, such as Mary Panzer's 1997 cultural biography of Mathew Brady, as well in essays that applied new methodologies from cultural studies to the history of photography, exemplified by Alan Trachtenberg's 1991 "Photography: a Key Word," and in 2000, "Cartes de Visite and the Culture of Class Formation" by Andrea Volpe.

ANDREA L. VOLPE

See also: Draper, John William; Snelling, Henry Hunt; Daguerreotype; and Lea, Matthew Carey.

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AMICI, GIOVANNI BATTISTA (1786–1863)

Italian astronomer, botanist, microscopist, and inventor.

Giovanni Battista Amici invented the Amici Prism, which combined three prisms for use in refracting spectroscopes. This system is still used today in modern spectroscopy to differentiate light into its separate spectral components. Amici collaborated with Bertrand to design the Amici–Bertrand lens, which could view an objective's rear focal plane. This meant it was possible to view, for example, interference patterns produced by birefringent crystals (e.g. in plastics). Amici also devised an achromatic lens and designed reflecting telescopes. Amici was Professor of Mathematics at the University of Modena from 1815-1825, until being appointed Head of the Astronomical Observatory in Florence in 1831. Amici established a friendship with William Henry Fox Talbot, from meeting in 1822; they corresponded for more than twenty years. Talbot wanted his work on nega-

tive-positive paper photography to be known throughout Europe and he chose Amici to be one of the Italian scholars that he would entrust examples of his work to. In 1822 Talbot, after seeing examples of Amici's work, requested that Amici design a reflecting microscope for him; then, shortly afterwards, a microscope micrometer. Talbot's work was promoted in Florence by Amici and Talbot's sisters, Caroline and Horatia, in the 1840's, in Talbot's absence. As a result of Amici's friendship with Talbot's sisters, Talbot's work gained the recognition he desired without his presence. In 1840 Amici devised an oil-immersion system that improved the optical aberrations found in microscopy. He then went on in 1855 to improve on this with his water immersion lens.

JO HALLINGTON

ANDERSON, JAMES (1813–1877)

British photographer of architecture and works of art

Part of a famous dynasty of photographers in Rome, after Alinari and Brogi in Florence, Anderson is known for his architecture views and reproductions of works of art. Born in England, Isaac Atkinson studied in Paris and got installed in Rome in 1838. He took the name of James Anderson the year after. He certainly began photography in 1845 and joined the group headed by Greco's. He sold his photographs in Joseph Spithover's bookshop situated 85, Piazza di Spagna.

Anderson, James. "L'arc de Setime Severe au Velabre, Nomme L'arc des Orfevres."
Courtesy: The J. Paul Getty Museum, Los Angeles. © The J. Paul Getty Museum.

Anderson contributed in 1857 to an album entitled *Rome* containing fourteen of his views. Two years after, he published a catalogue counting four hundred and fifty photographs. He took part in photographic exhibitions in Scotland in 1857 and in London in 1862. His images, well contrasted and clearly composed, gave a new vision of the city, far from picturesque, and closer to architectural layout and documentation. Very appreciated, Anderson is one of the first professional photographer active in the Peninsula. His son Domenico took back the firm successfully. In the 1930s, Anderson counted 40,000 negatives, but the activity stopped in 1960. The archives were bought in 1963 by Earl Cini who thus gathered Anderson to the Alinari collections.

LAURE BOYER

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ANDRIEU, JULES (active 1850s–1880s)

French photographer

The term "Paris Commune" (La Commune de Paris) originally referred to the government of Paris during the French Revolution. However, the term more commonly refers to the socialist government that briefly ruled Paris from 18 March (more formally from 26 March) to 28 May 1871.

The photographs made by approximately a dozen French photographers such as Andrieu during the Paris Commune of 1871 focus on the architectural ruins in Paris left in the wake of these conflicts. These images, especially Andrieu's are void of human figures or signs of life, and appear today as compelling representations of destruction and loss.

Because photography could sometimes be a form of objective documentation, this medium served as a means of propaganda, which generally denounced the reprisals against the communards. From 1871 on, 'collections' of demolished buildings were published: the Hôtel de Ville, and the Tuileries, etc. Various Parisian photographers such as Jules Andrieu traveled around Paris during the events to take photographs of the unfolding events. Andrieu was a photographer-craftsmen and laboratory

technicians who adapted to the "market" of photography. For technical reasons his exposure time was short. Paris seems deserted in most of his images with only a few people appearing them. In some images by Taupin, Ferrier, and Lecadre, fires and such are evoked by crude touching-up of the prints with paint.

This photographic production has a two-fold implication. The images not only serve as historical documents of the event, but they serve as documentation of historical problems of censure and politics as captured in the image and how that image was taken. The power of images like these resides in the reproducibility of them, a market which continued to grow in size and importance with the development of photography, especially cinema and television.

In this market, the Commune of Paris proved to have an economic ground that bore fruit. Reproductions of monuments on fire, of the Vendôme column, and of Paris completely devastated were sold as rolls in Provinces and abroad. In London particularly, these photographs achieved enormous popularity to the extent that the Agency Cook Travel began organizing visits for groups of people.

The photographs entitled "Desastres de la guerre" by Andrieu are silver prints on albumenized paper measuring approximately 29 by 38 cm, most probably made from wet collodion glass negatives, the technology overwhelmingly preferred at the time. To date, forty-seven separate images of "disasters" have been identified by their identical presentation and their shared dimensions and subjects of Parisian architectural ruins of 1870 and 1871. All these photographic prints are mounted on much larger blue-gray cardboard with a red embossed stamp, centered underneath the print, bearing the series title, Desastres de la guerre. It was on October 30, 1871, that Andrieu registered twenty-one prints with the Depot Legal, the government bureau regulating commercial prints, under a series title Desastres de la guerre, along with individual titles, which he numbered by hand from one to forty-four, skipping numbers. A photographic album now in the Canadian Centre for Architecture, La Guerre et la Commune, includes twenty-one of Andrieu's Desastres in conjunction with other pictures that offer a rare example of the manner in which such Commune photographs were sold and collected in the later nineteenth century.

Jules Andrieu and his studio were primarily devoted to the commercial production of the ruins of the among others such as Hyppolite Collard, Alphonse Liébert, Pierre Ambroise Richebourg, Disdéri and Pierre Edmonds, and others as well. The political actors in conflicts also used photography and called upon these studios to take images for them. The government of Common often had photographs taken of the killed National Guards whose identity could not be proven. As of April 1871, the authorities of Versailles made photography profitable in the identification and documentation of the Communards operations. The image served many purposes. Very quickly, censorship controlled the production of images that were still being sold years later. By the end of 1871, prohibition was enacted banning the intent to hawk and put on sale images and emblems likely to disturb public peace" and in particular the "portraits of the individuals charged or condemned for their participation in the insurrectionary facts." The only authorized exceptions were "reproductions, which are made from a purely artistic point of view of the fires of ruins of Paris."

Photography, like all media, is ambivalent and even ambiguous and is perhaps both at the same times and often a source of information and a tool of misinformation. An image of a tumultuous event is often more than just an image. The photographs of the ruins of Paris are images of war and the questions remains why did people start to collect and admire them. Recent historical approach has proposed political and class-based readings of the photographs of Andrieu. Historians of art, photography, and culture who are concerned above all with determining the political positions of the photographers have divided these images into pro-and anti-Commune camps, clarifying the ambiguity of photographs so that a consistent message can be sent instead of contradictons. Historians however have tended to privilege what they consider to be pro-Commune photographs and photographers, linking them to the proletariat. The so-called pro-Commune photographs constitute only a small proportion of contemporary Commune-related imagery, and these had indeed suffered in the earlier ideologically driven (that is, anti-Commune) illustrated histories of the political moment. Such scholarly efforts to recuperate these images have provided a fuller view of Commune representation, if not greater sensitivity to their broader meanings outside the specific politics of this radical movement.

JOHAN SWINNEN

See also: France; Cartes-de-visite; Albumen Print; Photogravure; and Photography and Reproduction.

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ANGERER, LUDWIG (1827–1879) AND VIKTOR (1839–1894)

The brothers Ludwig and Viktor Angerer are variously described as being of Hungarian or Austrian nationality. They were born in Malaczka, Hungary.

Ludwig was trained as a pharmacist in the early 1850s, and some accounts state that he served as a pharmacist in the Austrian army, while others place him in the Imperial Pharmacy at Donauländern. Initially, photography was his hobby, but a series of views of Hungary and Austria, taken during his military service in the Danube countries in 1854, brought him to public notice, and apparently encouraged him to make his hobby his profession.

He moved to Vienna, probably in 1857, and opened a photographic studio in the city, quickly earning a reputation for high quality portraiture, both indoors and outside in the garden of his home.

By 1864 he was a member of the executive committee of the Photographic Society of Vienna, which, according to Eder, brought him into contact with Anton Friedrich, then manager of Voigtländer's premises in Vienna. This led to Angerer acquiring and working with Voigtländer's recently introduced and massive 8-inch diameter Petzval-style portrait lens. Indeed, it was Angerer's own lens which was displayed at the Berlin International Photographic Exposition in the following year. With this lens, he produced a series of very large format portraits, and his achievement was reported in the review of the exposition published in *Photograpische Korrespondenz*

> Ludwig Angerer exhibited portraits, busts and three-quarter lengths, taken with an eight-inch Voigtländer lens. From the technical standpoint, these were highly successful and vigorous without retouching, but, unfortunately, they were not as much appreciated as the difficulty of their production made them deserve…. The nucleus of his exhibit were the portraits, size 13 × 16 inches, taken with a six-inch Voigtländer lens.

That six-inch diameter lens, introduced in 1860 in two different focal lengths, weighed in at a massive 31 lbs! The weight of the eight-inch version must have been considerable. Indeed, so heavy was it that Angerer had to design a special tripod to carry the weight of the camera and its optic, with geared mechanisms to raise and lower the camera. Camera, lens and tripod reportedly weighed over two hundred pounds!

Angerer is credited with the introduction of the carte-de-visite into Vienna in 1857, and thereafter he produced and marketed many portraits of the Austrian Imperial family and celebrities in that format as well as the larger format prints for which he was already renowned.

His continued success led to expansion of his premises, and a larger studio, illuminated with blue glass skylights, was opened in 1867. It was in this studio that he was joined by his brother Viktor in 1872, or 1873. Viktor had previously operated his own highly successful studio since the early 1860s. Their partnership, as L & V Angerer, apparently lasted just over a year as Ludwig's health deteriorated and the operation of the studio passed solely to Viktor. Ludwig died in 1879, aged 52, and one of his sons and his daughter would, for a time, work as photographers in the family studio.

Viktor was a military engineer by training, having briefly operated a portrait studio in Bad Ischl at the age of twenty. On leaving the military, he returned to photography, eventually becoming Court Photographer to the Austrian Imperial Family. A pioneer in the production of photographic enlargements in Vienna, he reportedly visited Claudet in London in 1861 to familiarize himself with the challenges of using Woodward's solar enlarging camera. His photographic career spanned more than thirty years, and embraced both photography and the manufacture of photographic materials, during which time he produced celebrated portraits of Austrian celebrities, including a fine series of studies of Johann Strauss in the early 1890s.

A series of photographs exhibited in the 1863 exhibition of the Photographic Society in London, and identified only as by 'Angerer' were probably examples of both men's work. They had previously been exhibited in Paris, and were brought to the London exhibition by the Société française de photographie. Amongst them are two portraits of the Empress of Austria, probably by Ludwig, but the majority relate to technical experimentation which the two men undertook around that time. Amongst them, large format portraits of Voigtländer, Callaghan, and one of the Angerer brothers—and taken with Voigtländer lenses—are probably by Ludwig. '*A Photograph on albumenized paper, magnified eight times without being retouched, produced by means of the Solar camera*' clearly stems from Viktor's 1861–2 experiments with enlarging. The experimental nature of the images in this exhibit is underlined by the fact that, with the exception of the portraits of the Empress, the subject matter of the images was not catalogued, while lenses used are precisely described. Thus, the catalogue confirms, two images (subject unknown) were taken with the 'short-focus' version of Voigtländer's six-inch diameter lens.

In 1881 he is recorded as the proprietor of the Photographic Art Institute of Vienna, the most celebrated studio in the Austro-Hungarian Empire, for which he bought a licence from Karl Klic to use Kilic's heliogravure printing process, having received training at Klic's Photochemical Works. Printing, by heliogravure, collotype and photogravure, eventually became an important aspect of the studio's activities.

While Klic was refining his process, he used dry

collodion plates manufactured for him by Angerer's newly opened dry plate factory. Perhaps as a reaction against the uncertainty of mass produced materials at the time, Angerer had joined forces with another of Vienna's most celebrated photographers, Dr. Székely, to manufacture plates to their own exacting standards. The operation lasted only a decade, however, and by 1892 Viktor Angerer had built a new home and studio on the factory site. The Strauss portraits must have been amongst the first taken at the new premises. Viktor died in 1894, at the age of 55.

The studio finally closed at the outbreak of the Great War, 1914.

JOHN HANNAVY

See also: Claudet, Frances George; Eder, Joseph Maria; Petzval, Josef Maximilian; and von Voigtländer, Baron Peter Wilhelm Friedrich.

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ANIMAL AND ZOOLOGICAL PHOTOGRAPHY

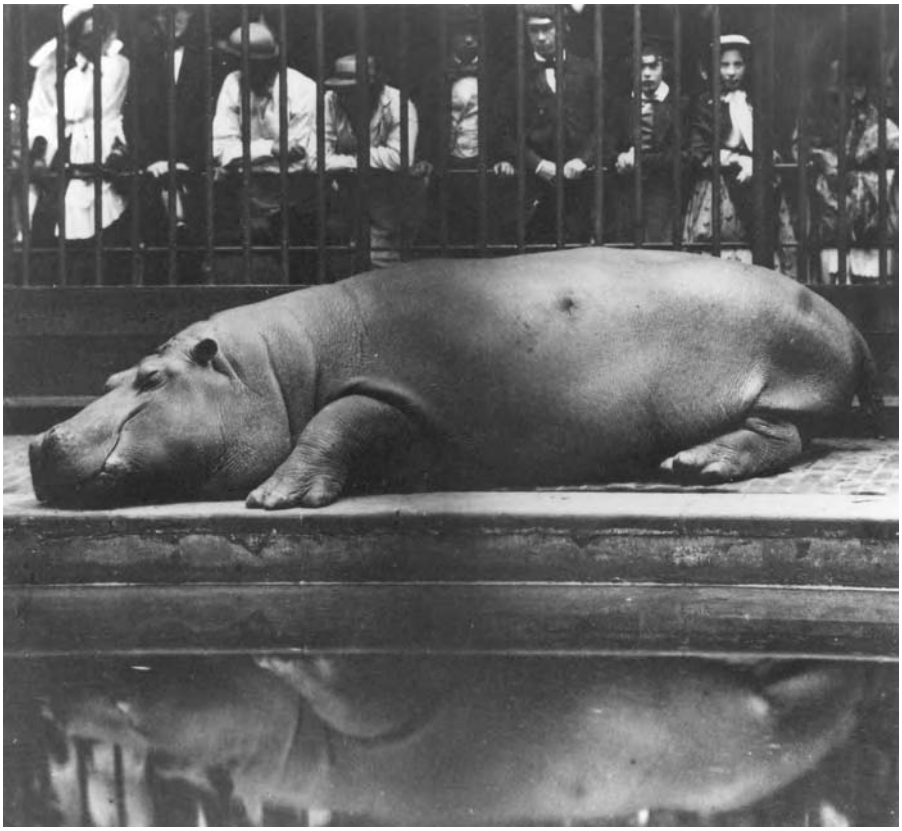
Due to the need for long exposure times in the first years of photography 1839–1845 only fossils, dead or stuffed animals could be photographed on metal and paper (some by use of the microscope) while from the mid-1840s domesticated animals in static poses appear in daguerreotypes by Bisson Frères and others. From 1851 access to exotic live animals in new public "zoological gardens" coinciding with the development of faster wet-collodion plates, was a boon to photographers and scientists alike. Spanish gentleman-amateur Juan de Borbón Comte de Montizon (1822–1887) exhibited numerous collodion photographs of beasts, birds and fish taken at the London Zoo between 1852–1858 and in Paris in 1860 Louis de Lucy (Louis Godefroy Lucy-Fossarieu, 1822–1892) was official photographer for an album for the new Zoological and Botanical Acclimatisation Garden in the Bois de Boulogne.

In *The Photographic News* of 23 February1866 Frank Haes (1832–1916) described the difficulties of working with slow speed plates and unpredictable subjects over two years work at London Zoo preparing his series of stereographs for sale. His difficulties were slight compared to those of explorer James Chapman (1831–1872) in Namibia who secured a few images of dead wild animals using a French stereograph camera in 1861–62.

The publication potential of the new negative-positive collodion process inspired the Paris Museum in 1853 to commission Bisson Frères (Louis-Auguste (1814–1876), Auguste-Rosalie (1826–1900) to make photographs for a serial publication *Zoologie photographique, ou représentation des animaux rares dés collections du muséum d'histoire naturelle* with 60 plates made using Niepce's photomechanical process. The British Museum followed suit in 1854 engaging Roger Fenton (1819–1869) but did not produce a zoological publication. Later publications such as that of the Harvard College Museum of Comparative Zoology in 1873–1874 had photographs by John Carbutt (1832–1905) reproduced in the superior photomechanical process of woodburytype.

A number of specialist pedigree animal photographers worked in Paris in the 1850s–1860s. Adrien Tournachon (1825–1903) made photographs at bovine and equestrian shows later using Adolphe Bertsch's rapid collodion plates with the salt paper process in the mid-1850s but his work was eclipsed by the scale and style of an equestrian *studio hippique* set up in the Bois de Boulogne in 1860 by Jockey-Club member Louis Jean Delton I (1807–1891). The latter posed clients on their steeds or in horse and carriage teams outdoors against a variety of stylish scenic backdrops. Léon Cremière (1831–1913) editor and illustrator of the sports journal *Le Centaure* (1866–1869) produced albumen and woodburytype photographs on lettered cards of pedigree dog in shows. Cremière published an album on bloodhounds; *La Vénerie Française* [*French Hunting*] on the show of 1865 and Delton an *Album hippique* [*Equestrian album*] in 1870.

The French studios practised a form of portraiture, while in Scotland from the late 1850s Horatio Ross (1801–86) used dead props to make pictures of hunting scenes enlivened with titles like "I have got him at last." Others like Willoughby Wallace Hooper (1837–1912) in India also catered to the hunter's desire for on the spot proof and souvenirs with staged hunting scenes in the late 1870s. John Dillwyn Llewelyn (1810–1888) in England in used stuffed animals in natural settings in the early 1850s but turned to his own oxymel "dry" preservative process in 1856 to do outdoor animal studies In Vienna photographer C. Wrabertz used taxidermy specimens for bird photographs in E. Hodek's *Europäische Raubvögel, serie 1* [*European Birds of Prey series 1*] in 1874 and Canada William Notman (1826–1891) a fine canine pet portraitist, used taxidermy in 1876 for his illustrations to H.G. Vennor's *Our Birds of Prey, or the Eagles, Hawks and Owls of Canada*. Taxidermy facilitated comic tableaux works such as those by cat



Juan de Borbon, Count de Montizon. The Hippopotamus at the Zoological Gardens, Regent. *The Metropolitan Museum of Art, Gilman Collection, Purchase, Ann Tenenbaum and Thomas H. Lee GIft, 2005 (2005, 100.14) © The Metropolitan Museum of Art.*

specialist H. Pointer in England in the 1860s–1870s and melodramatic 'perils of the wilderness' 1890s stereographs in America by George Barker (1844–1894).

A substantial market developed in the 1860s for animal studies called *études* for use by artists and designers. One of the main publishers from the 1860s on was the Alsatian firm of Adolphe Braun (1812–1877) in Mulhouse which released many series on rural animals as well as and giant carbon prints of still-life studies of dead game. Achille Quinet (1831–1900) and Constant Famin (in France (1827–1888) produced picturesque farm animal studies and one of the most prolific animal specialists Charles Reid (1837–1929) in Scotland the 1880s, undertook extensive journeys to add types of animals to his inventory.

The ability to capture more than what the eye could see awaited the development of the dry-collodion plate in the 1870s and technical innovations in lenses and shutter mechanisms into the early 1880s. The great pioneers were Étienne-Jules Marey (1830–1904) in Paris from the 1860s and British-born Eadweard Muybridge (1830–1904) in California in the 1870s and 1880s. In 1878 Muybridge used fast Dallmeyer lenses and a line of cameras with trip wires to prove a horse's legs left the ground while at full gallop. Muybridge developed his zoopraxiscope an early form of cinematography which Marey saw in Paris and developed his pistol camera and sequential chronophotography process making some of the most beautiful and scientifically precise images of bird flight. Others including German Ottomar Anschütz (1846–1907) took up the new animal locomotion methods and designed his own rapid shutter and became a pioneer of cinematographic apparatus. In 1884 he published a sequential shots of a stork leaving its nest and over the next two years undertook hundreds studies of animals in the Posen Zoo and a private deer park. Using a hide and a race to confine the animals and possibly fake scenic backdrops, Anschütz's close-ups gave a powerful illusion of animals in the wild. At the same time in Paris Louis-Jean Delton's son Jean II (1850–after1917) trading as J. Delton, used the new rapid gelatin bromide dry-plate negatives to make 'instantaneous' photographs showing horses rearing and jumping. He published a series of albums of photogravures and platinum prints of riders in action in the Bois de Boulogne from 1882 and took one of if not the first, in situ race-finish photographs in 1885. In 1917 Delton II claimed to have been the first in Europe to capture horses in movement and had letters from pioneers like Marey attesting to his success.

In 1887 Muybridge having renewed his earlier experiments utilising an electro-magnetic device to trigger the shutters on his banks of cameras and made hundreds of animal movement studies, some of which were made at the Philadelphia Zoo and Gentlemen's Driving Park. The work was published in eleven volumes of collotypes

titled *Animal Locomotion. An Electro-Photographic Investigation of Consecutive Phases of Animal Movements*, a work that has continued to fascinate artist and the public ever since.

Photography was also pursued as part of the documentation of government sponsored natural history and geographic expeditions starting with the Spanish Pacific Scientific Expedition 1862–66 for which Rafael Castro y Ordóñez (1834–1865) was official zoological photographer but took mostly views. The British oceanographic study undertaken in the *Challenger* in 1872–1876 brought the first photographs of penguins in Antarctica to a wider audience, and Canadian geologist explorer J.B. (Joseph Burr) Tyrrell (1858–1957), a geologist employed by the Geological Survey of Canada, photographed massive caribou herds at Carely Lake in the Barren Lands in 1893.

Photography played a key role also in stimulating conservation campaigns. In Montana in 1879 military photographer Laton A. Huffman (1854–1931) recorded the mass extermination of bison in the 1880–1890s. The lesson of those losses affected former big game hunters such as the American Judge George Shiras 3rd (1832–1924) (an amateur naturalist, who urged adoption of the camera instead of the gun and promoted conservation. In 1898 Shiras developed a technique for photographing animals at night using trip-wired flash. German hunter Carl George Schillings (1865–1921) on safaris in East Africa in the late 1890s became a conservationist. His later work with flash would make him the best-known modern wildlife photographer.

In the 1890s an industry developed catering to both amateurs and professionals interest in 'wildlife' photography (though few faced predatory animals). Thomas Dallmeyer made a special naturalist's camera and introduced the first telephoto lens in 1891. In 1897 the first German natural history book on middle European game animals by Dr Wurm was marketed on the basis of its profuse illustration by 'snapshots from life' (some by Anschütz). However, the deluxe albums and high quality books were overtaken by half-tone reproduction process which supported an explosion in naturalist books and magazines. Beginning in 1895 with *British Birds' Nests* brothers Richard and Cherry Keaton showed how they had mastered close-up studies by their ingeniously camouflaged hides and other devices to reach inaccessible places.

From the outset of the development of photography in the 1840s, the value of applying photography to the study of creatures, domestic or wild, dead or alive, their habits and habitats on land, sea and in the air was predicted and partially fulfilled by the end of the century. The indispensable role of photography in popular journals such as *National Geographic* founded in 1898 awaited the new century fast mechanical shutters, rapid plates, reflex cameras and telephoto lenses and flashlights and orthochromatic plates.

GAEL NEWTON

See also: Anschütz, Ottomar; Barker, George; Bertsch, Adolphe; Bisson Frères; Braun, Adolphe; Castro, Rafael y Ordóñez; Carbutt, John; Chapman, James; Cremière, Léon; Chronophotography; Dallmeyer, Thomas; Delton I, Jean (Louis Jean); Delton II, Jean; Fenton, Roger; Haes, Frank; Hooper, Willoughby Wallace; Llewelyn, John Dillwyn; Marey, Étienne-Jules; Notman, William; Quinet, Achille; Ross, Horatio; Schillings, Carl George; Tournachon, Adrien; and Woodburytype.

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ANNAN, JAMES CRAIG (1864–1946)

Scottish photographer and photogravurist

Annan was an important international figure in photography's fight for recognition as an art in its own right at the turn of the nineteenth century. Then anyone interested in Pictorial Photography would know his work, exhibited throughout Europe and the United States from St Petersburg in 1894 to Buffalo in 1910 and reproduced in many journals including *Die Kunst in der Photographie* of Berlin and *Camera Work* of New York.

He learned photography from his father Thomas Annan and went in 1883 to Vienna to learn photogravure from its inventor Karl Klíč. When in 1887 his father died the family firm became T. & R. Annan & Sons, Glasgow, Photographers and Fine Art Publishers. James became a partner specialising in photogravure for the reproduction of works of art, for example, *Sir Henry Raeburn: a Selection of his Portraits*, Constable, 1890, and for book illustration, an early example, G. Christopher Davies, *Norfolk Broads and Rivers*, Blackwood, 1883, and a macabre example, William Macewen, *Atlas of Head Sections*, Maclehose, 1893.

About 1891 Annan decided to make his own photographs. In 1892 a trip to North Holland produced what must have been a breathtakingly fresh exhibition in the firm's new galleries, its interior, furniture, and the picture frames designed by George Walton. The almost abstract "On a Dutch Shore" captures the roar of wind and sea as a catch of fish is auctioned on the open beach. "The Beach at Zandvoort," merely 4.6 cm by 23.3, has figures which at first appear like irregular notes of music pushed into a slanting line across the top of the composition. These two photogravures alone almost reduce The Hague School to costume painters.

Annan's trip in 1894 to North Italy produced in 1896 a folio of eleven photogravures, *Venice and Lombardy*. The minimal "Venice from the Lido" shows Annan following his own advice to set up, then watch and wait and wait, until, in this case, the shape of the drifting gondola came into a visual harmony with the posts in the channel and the distant towers of the city. Annan stated that he had no set of rules. He worked 'by the inspiration of the moment'.

1894 brought him astounding recognition. He was elected a member of The Linked Ring. He showed more prints than anyone else at the Photo-Club de Paris. He exhibited at the Joint Exhibition in New York and "The Beach at Zandfoort" was used as a frontispiece for *The American Amateur Photographer*. He exhibited in St Petersburg, and, at the London Salon, sold a 45.4 cm carbon of "The Lombardy Ploughing Team" for three guineas to Harold Holcroft, an early collector.

Annan was an early advocate of the hand camera. Stieglitz obtained one sometime in 1892–93. Annan had exhibited hand camera prints in 1891 and presented an entire exhibition "North Holland" in 1892. When in 1897 Stieglitz wrote about the hand camera he quoted from Annan's article in *The Amateur Photographer* of March 1896. Annan and Stieglitz were exact contemporaries. They enjoyed a long correspondence. Stieglitz owned sixty Annans.

Annan delighted in the seizing of the moment, for example, the practised glance of William Strang examining his etching plate, or the tiny, restless, almost eerie, movement of the white horse in the farmyard below Stirling Castle.

In photogravure the image is transferred to a plate to be worked on as an etcher would. Annan enjoyed this immensely. "The Etching Printer—Willam Strang, Esq," 1902, was heavily manipulated with its background and the wheel of the etching press washed out leaving the very subject of the work, Strang's eye and his plate, sharp. Annan explored other manipulations. Adding "Ex Libris Dorothy Carleton Smyth" to a print of her portrait resulted in a photographic book plate.

During its 1901 International Exhibition, Glasgow was the centre of Pictorial Photography. Annan assembled 201 pictorial works from Austria, Belgium, England, France, Germnay, India, Italy, Scotland, Russia, Switzerland, and the United States. In addition, he asked Steigltiz to select the American section. He provided, with a few exceptions, the works which in 1902 announced the arrival of The Photo-Secession. T. & R. Annan & Sons were also official photographers to the International Exhibition. Three years later they built the most handsome new premises in Sauchiehall Street.

Annan produced some fine portraits deeply redolent of their time. Anne MacBeth, who taught at Glasgow

School of Art, wears her wide collar heavily embroidered with roses and hearts. Jessie M King, the book illustrator, gazes out from under a huge bonnet. The image of the architect and designer C. R. Mackintosh known today is the one Annan created of him in tweed suit, flowing bow tie, minute kiss-curl on forehead. Annan's rotund G. K. Chesterton carries faint echoes of Hill and Adamson's "Professor Alexander Monro."

Annan could recall as a child meeting D.O. Hill and he knew well two volumes of calotypes which Hill's widow had presented to his father, a close friend. About 1890 he made a set of twenty photogravures from their original calotypes. He lent prints to Hamburg in 1899, to Stieglitz's '291' Gallery in New York in 1906, where Hill was presented as the Father of Pictorial Photography, to the Salon in London in 1909, and to Buffalo in 1910. He also supplied Stieglitz with photogravure prints of their work to appear in *Camera Work* in 1905, 1909 and 1912. At the very end of Annan's life Helmut Gernsheim, addressing him as "a great master of photography," asked for information about Hill. Annan corrected the account of Hill in Gernsheim's *New Photo Vision*, Fountain 1942, by mentioning Brewster and Adamson. However, Gernsheim gave Annan his due, "Hill was only thought of again when photography was rediscovered as an art by Craig Annan and his circle."

Principal collections of Annan's work: Metropolitan Museum of Art, New York; Museum für Kunst und Gewerbe, Hamburg; Royal Photographic Society; Scottish National Portrait Gallery; Staatliche Museen zu Berlin.

WILLIAM BUCHANAN

Biography

James Craig Annan, the second son of Thomas Annan and Mary Young Craig, was born on 8 March 1864 at Talbot Cottage, 15 Burnbank Road, Hamilton. He left school in 1877 when the family moved to Lenzie to set up a carbon printing works. About 1878 he attended chemistry lectures at Anderson's college. In 1883 he learnt photogravure from Karl Klíč in Vienna. On his father's death in 1887 he became a partner in the firm. About 1890 he made photogravure prints from Hill and Adamson calotypes. He lent these to exhibitions in Europe and the United States. He championed their work. Also about this time he decided to become a creative photographer. In 1894 he was elected a member of the Linked Ring. He exhibited, often by invitation, in New York, Paris, St. Petersburg, Brussels, Antwerp, Munich, Berlin, Philadelphia, Hamburg, Turin, the Hague and other places. His work was also widely reproduced in the many photographic magazines of the time. He remained a bachelor. He died on 6 July 1946 at his home, Glenbank, Lenzie.

See also: Gernsheim, Alison and Helmut Erich Robert; Hill, David Octavius, and Robert Adamson; Stieglitz, Alfred; Photo-Club de Paris; Brotherhood of the Linked Ring; and Annan, Thomas.

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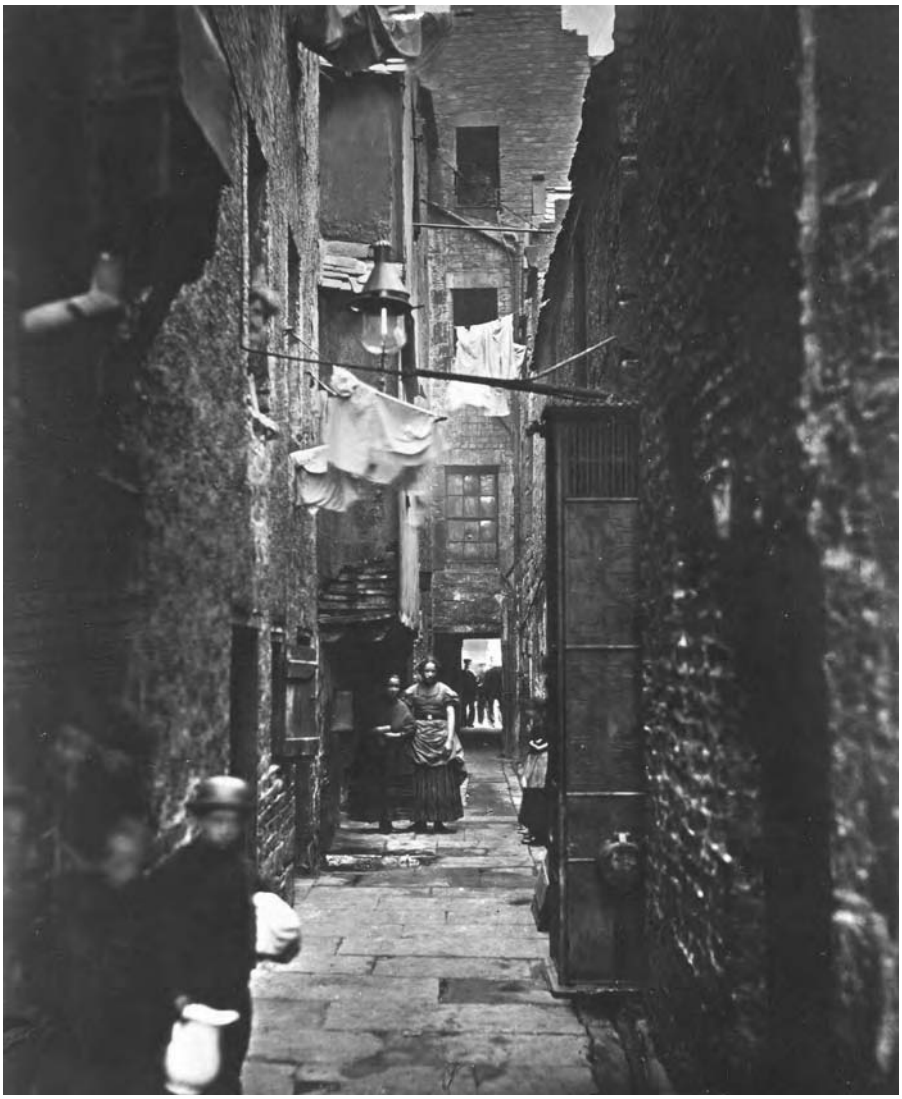
ANNAN, THOMAS (1830–1887)

Scottish photographer and founder of a photographic firm

Thomas Annan, who lived when the commercial aspects of photography were being explored, established his firm, T. & R. Annan, in Glasgow. His obituary in *The British Journal of Photography* noted his high reputation for the reproduction of works of art, as photography replaced techniques like engraving, but it made no mention of Annan's qualities as a photographer. He created some of the memorable images of his century.

In 1862 the Glasgow Art Union, to replace the usual engravings issued to its subscribers, asked Annan to produce photographic prints. These proved acceptable. Annan did not merely photograph a painting. He gave a print of it to the artist to work upon. This was then photographed and from that negative the prints were made. The reproductions of Noël Paton's "The Fairy Raid" were made this way.

Annan kept in the forefront of the new permanent processes. The rights to Joseph Swan's carbon process were bought by Braun for France and Belgium, by Hanfstaengl for Germany, by Annan in 1866 for Scotland and by the Autotype Company, two years later, for England. Swan's first major production was to make in 1866 from Annan's negative, carbon prints, in three sizes, each in an edition of 1,000, of D. O. Hill's painting "Signing the Deed of Demission." Hill had originally advertised (23 years before) that the reproductions would be engravings. These carbon prints were hung in many a pious Scottish household. When Annan heard



Annon, Thomas. Close, No. 37 High Street.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

of photogravure he went to Vienna in 1883 with his son so that James (J. Craig Annan) could learn the process from its inventor Karl Klíč. Annan bought the rights of that process for Britain.

Annan turned photographer from engraver and lithographer in 1855. That year he photographed the first iron transatlantic steamer under construction, the gigantic 'Persia.' Very likely this was a commission from its creator Robert Napier.

Glasgow commissioned Annan to record two great civic enterprises. It constructed a new water supply which, daily, brought 50 million gallons from Loch Katrine through 35 miles of pipes to the city. This splendid piece of Victorian engineering is contained in the album *Views on the Line of Loch Katrine Water Works*, 1859 and *Glasgow Corporation Water Works: Photographic Views of Loch Katrine*, 1889, a record of sluices, salmon ladders, aqueducts, syphon piping, a gauge basin, etc., ending with a photograph of the water gushing in Kelvingrove Park from a fountain complete with the Lady of the Lake on top.

Glasgow also embarked on the demolition of its terrible slums. Unlike the crusading Jacob Riis in New York 20 years later, Annan's task was to record what was destined to disappear. Working in feotid and disease ridden conditions he produced the first thorough—and a most moving—account of the worst slums in Britain. "Close, No. 157 Bridgegate" is of dirt, decaying stone, grimy washing, the glint of effluent, yet by Annan's photography somehow made beautiful. The slum dwellers sometimes appear. In "Close, No.46 Saltmarket" they have been carefully assembled. At the centre is the figure of a boy set in front of the dark rectangle of a door. His stance, thin arms akimbo and surely not arranged by anyone, shows he has some determination left. What became of him?

Single prints of the slums were made. In 1871, the first edition, probably four sets of 31 albumen prints, was titled *Photographs of Streets, Closes, &c. Taken 1868–71*. The second edition, 1877, probably 60 sets, *Photographs of Old Closes, Street, &c., Taken 1868–1877* is of 40 carbon prints. The third edition, of 50

photogravures, was published in 1900 in two versions. One version, 100 copies, *Old Closes and Streets A Series of Photogravures1868–1899*, was published by Annan for the Corporation. The other version, 150 copies, *The Old Closes & Streets of Glasgow*, published by Maclehose were the only copies for sale. For the photogravure editions James sharpened the images.

Annan's landscapes, once highly regarded should be highly regarded again. In 1860 *The British Journal of Photography* found his "Loch Ranza" the best work at the Photographic Society of Scotland. In 1861 at the British Association in Manchester, "Aberfoyle" gained by common consent "the blue ribbon of merit." In January 1863 a review of the Photographic Society exhibition in London commented that Annan whose fine landscapes were little known in London, "from this time forth ... must take rank amongst our first-class artists." In January 1865 *The Photographic News* noted Annan's "deep poetic feeling," which is certainly evident in 'The Last Stooks of Harvest" and "Ferns" whose fronds are set against a carpet of tiny leaves. These two prints, 16 inches by 13, cost 7 shillings and sixpence each. In April that year Annan's "Dumbarton Castle" earned a silver medal from the Photographic Society of Scotland.

Annan was also a fine portraitist. His posse of Glasgow University Professors who appear in *Memorials of the Old College of Glasgow*, Maclehose 1871, are splendidly understated. Some handle a volume in the best manner of Hill and Adamson. Annan's most powerful portrait was taken in 1864 when the missionary and explorer David Livingstone was visiting his family who lived next door. Livingstone, anguish and suffering clearly visible on his face, sits at a table on which his consular cap is placed. Livingstone was then a hero. Annan created his sombre icon. Annan also photographed Livingstone's five year old daughter looking up at the strange man whom she had just met for the first time.

T. & R. Annan's *cartes-de-visite* were mainly of Free Church ministers but also included the "Rev. Dr Krummacher, author of *Elijah the Tishbite*, Berlin," two M.P.s, three artists, and from the Pacific 'Williamu, Chief Tanna Islands." They and 'Dr Livinsgtone, African Traveller" cost a shilling each.

Collections of Annan's work are in Glasgow University Library, the Mitchell Library, Glasgow and the Scottish National Portrait Gallery.

William Buchanan

Biography

Annan was born on 15 July 1830 in Fife. His "Dairsie Church" is a scene from his childhood. Under the bridge flows the River Eden. A laid led off to Lydox Mill, the family's corn and flax spinning mill. In the church yard lie his mother Agnes Bell and his father John Annan, Master Miller. In 1845 he left for Cupar to begin an apprenticeship in lithography and engraving. In 1849 he moved to Glasgow to work for a lithographic company. In 1855 he established a photography business though where he learned photography is not known. Two years later he moved into the first of several premises along Sauchiehall Street. Annan married Mary Young Craig on 27 July 1860. They had seven children of whom John and James (first and second children) worked for the firm. In 1864 he established a home, Talbot Cottage, and works at 15 Burnbank Road, Hamilton. In 1857 he moved to Lenzie to set up a carbon printing factory. Annan died at his home, Glenbank, Lenzie, on 14 December 1887. Two years later the firm became "Photographers and Photographic Engravers to Her Majesty at Glasgow."

See also: Hill, David Octavius, and Robert Adamson; Annan, James Craig; Riis, Jacob August; and Royal Photographic Society.

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ANSCHÜTZ, OTTOMAR (1846–1907)

German photographer and moving picture pioneer

History has not been kind to Ottomar Anschütz, a leading photographer of the later 19th century whose career was "almost forgotten," in the contemporary words of one critic, by the mid-1920s. Although he contributed many important technical improvements to photographic

work, significantly a practical focal-plane shutter that was in production for over 35 years in the cameras of C. P. Goerz in Berlin, and developed a moving picture viewer for his series chronophotographs that preceeded the Edison Kinetoscope, the rise of modernist aesthetics early in the 20th century and the unusual technology of his moving picture system combined wholly to eclipse his work. Until the 1990s there was neither any substantive research into his career nor any exhibitions devoted to it. One part of the problem in dealing with Anschütz is his own habit of secrecy regarding his work: he made an inviolable distinction between photographs that he considered artistic, and worthy of public exhibition, and those he considered commercial and therefore of little interest. As a result, he exhibited and also published his ground-breaking "instantaneous" pictures taken in 1883-1887 that captured the movements of animals, troops on manoeuvre, and, strikingly, storks in and around their nests, for almost 20 years until they became over-familiar and helped characterise his career as old-fashioned and passé. Another problem is found in Anschütz's extraordinary moving picture work, which absorbed him almost completely between 1886 and 1894: despite its success with audiences and its remarkable achievements in reproducing natural movement, his failings as a businessman led him to assemble huge debts by late 1892. This debt seriously threatened the social and economic standing of this provincial photographer who had risen to become the photographic instructor to the Kaiser's wife and family, and who circulated amongst the elite social and business personalities of Berlin. With imminent collapse facing both his reputation and his energetically led photographic business, Anschütz abandoned his pioneering moving picture experiments, even repressing its artifacts and pictures, so that this important part of his work also disappeared, leaving him at the end of his career between 1894 and 1907 in the superficial public record as a champion of amateur photography and defender of conservative genre photography. Obituaries noted the passing of one of the "old guard" of photography.

In the 1870s and 1880s, instantaneous photography, or exposures fast enough to capture quickly moving subjects in natural settings were the cutting edge of photographic technology. Photographers like the Graf von Esterhazy, Alfred Lugardon, and others took many prizes at international exhibitions for their often surprising mages of leaping dogs and jumping men, but it was Ottomar Anschütz who consistently led the field, principally by using a focal-plane shutter which he developed into a practical design in 1882, first used to take naturalistic photographs of troops during their field exercises. To aid his ability to work quickly, he etched a focussing scale on the outside of his lens tube, so he could change plates and make an accurate exposure very rapidly. His special camera, which Anschütz kept secret for seven years, also allowed him to develop a photographic method far in advance of its time: in an era when any photographic subject was universally subservient to the assumed demands of the medium, or to the imposed demands of the photographer's style, Anschütz gave his subjects complete freedom, his camera allowing him to simply follow their actions, whether farmers and workingmen around Lissa, which produced sequences of complete movements and activities, or animals from the Breslau Zoo photographed from a specially constructed blind, which produced informal images of foxes, leopards, monkeys and other animals. In this work, as the large collection of surviving prints with consecutive negative numbers at the Hochschule der Künste in Berlin illustrates, Anschütz with his plate camera anticipated the much later photographic practise of the leading photojournalists of the 1930s and 1940s with their fast-acting 35mm apparatus.

Anschütz turned to series chronophotography in 1886 with an impressive set of pictures of horses and riders taken at the Royal riding academy in Hanover. At first using a set of 12 cameras equipped with his focal plane shutter, the next year he developed a unique apparatus using 24 lenses and shutters but incorporating sophisticated adjustments so that complete, "closed" movements —where the first and last images would match when reproduced in a circular viewer like the zoetrope or phenakistiscope—could be recorded. Building his own electrically-based viewer called the Schnellseher, which used the intermittent flash of light from a Geissler tube to illuminate series photographs fixed to the rim of a rotating disk, Anschütz then began to exhibit photographic moving pictures in public, first at the Ausstellungspark in Berlin in 1887. Over the next five years some eight different models of this viewer were widely exhibited across Europe and America, often in "Schnellseher parlours" of a dozen or more machines such as those in New York City, Berlin, Hamburg, and London. For the commercial deployment of his Schnellseher, Anschütz made special entertainment chronophotographs, none of which survive, including subjects like *Skatspieler* (Card Players), *Mimenspiel* (Man with Changing Expressions), *Lustige Fahrt* (Funny Journey) and *Barbierstube* (Barber Shop Scene), several of which were precisely echoed in the earliest films of Thomas Edison, the Lumère brothers, and Georges Méliès. Because of an odd business agreement with the leading electrical firm of Siemens & Halske, which manufactured some 137 automat Schnellsehers for him, the financial collapse of the Electrical Wonder Company in London left Anschütz with a personal debt of over 47,000 Marks to the Berlin firm, and after the EWC's failure he repressed most of his chronophotographic work, including over 100 series of dancers intended for teaching and an

extensive series showing the work of the German Post Office. His only surviving chrnophotographs are those he sold as photolithographs beginning in 1887, those that were printed for zoetrope bands, and a collection of contact print leporellos at the Hochschule der Künste in Berlin that were probably included with a report to the Culture Ministry, who had financially supported his early work. Between 1894 and his unexpected death in 1907 he promoted amateur photography with lectures, teaching, and an elaborate studio and exhibition space opened in 1896. He devised and manufactured a number of photographic accessories, including a compact arc lamp, portable darkroom, changing bag, universal tripod head, and other apparatus; founded a commercial organization to resist the inroads of foreign photographic suppliers to the German market, particularly the Eastman Company; and accompanied the Kaiser and his family on a long trip through the Holy Land in 1898. His later photographs, still technically supeurb, were nonetheless often highly retouched in part and reflected the romantic imagery of an earlier era.

DEAC ROSSELL

Biography

Ottomar Anschütz was born on 16 May 1846 in Lissa in the Prussian province of Posen (today Leszno, Poland), the son of Christopher Berthold Anschütz, a respected local decorative painter who took up photography late in his career. Trained in drawing and painting, the young Anschütz studied photography with Maksymilian Fajans in Warsaw, Ferdinand Beyrich in Berlin, Franz Hanfstaengl in Munich, and Ludwig Angerer in Vienna before returning to Lissa to take over his father's business in 1868. In the late 1870s he built a travelling studio to expand his clientele, in 1881 he began working with dry plates, and the next year he photographed army manouvers with a camera of his own design incorporating a practical focal plane shutter and a focussing guide etched on the lens tube. With this camera, its innovations kept secret for years, he began to achieve a national and then European reputation for taking "instantaneous" photographs that captured quick movements in natural settings with both sharpness and clarity, with a series of photographs of storks in their nests receiving particular acclaim. He established a studio in Berlin in 1884, and in 1885 began to take series photographs in the manner of Muybridge using a set of 12 cameras, supported by a grant from the Prussian Ministry of Culture. In 1886 he devised a wholly new camera unit with 24 lenses and outfitted with complex adjustments so that a variety of subjects could be reproduced in a rotating viewer such as a zoetrope; he designed several new and innovative models of zoetrope, one of which carried three rings of viewing slots and allowed didactic examination of movement. The same year, Anschütz built his own viewing apparatus, called a Schnellseher, using a continuously rotating disk bearing between 17 and 24 images linked to a strobing light source to provide the necessary intermittentcy to register clear moving pictures for its spectators. Between 1886 and 1895 eight models of Anschütz Schnellsehers with his series photographs were widely exhibited in Europe and North America, seen by 14,858 people in five weeks in Frankfurt a. M. in 1891 and 56,645 people in Hamburg in 1895, but his arrangements for the commercial exploitation of his apparatus, through the specially-established Electrical Wonder Company in London, were drastically undercapitalized and quickly collapsed. From 1894 Anschütz gave up his decade-long obsession with moving pictures and devoted his energies to supporting amateur photography, especially amongst the social elite of Berlin, where he had long been the photographic teacher to the Kaiser's family. He continued to make commercial portraits, few of which have survived, led an industry boycott of "foreign" photographic products from the George Eastman Company, and died suddenly of complications from acute appendicitis on 30 May 1907. His studio in Berlin continued to operate under his name, often directed by his son Guido, until 1925.

See also: Chronophotography.

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ANTHONY, EDWARD (1819–1888) AND HENRY TIEBOUT (1814–1884)

For much of the nineteenth century the firm of E and H T Anthony was the dominant retailer and photographic manufacturer in the United States.

Edward Anthony (1819–1888) was born in New York and graduated from Columbia College in 1838. In December 1839 he paid to see François Gouraud's exhibit and lectures on the daguerreotype and the following year he became a pupil of Samuel F.B. Morse. He was given

Anthony, Edwards and Henry Tiebout. C. S. Soldier killed in the Trenches, at the storming of Petersburgh, VA., April . . . The wound is in the head caused by a Shell, by Timothy H. O'Sullivan.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

his first important photographic job photographing the American/Canadian border for the US government and on his return in late 1840 or early 1841 he opened his first daguerreotype studio where he also sold daguerreian supplies.

During the 1840s Anthony formed numerous business partnerships and continued to expand his studio and retailing activities. Between December 1846 and 1848 Anthony undertook correspondence with William Henry Fox Talbot to encourage Talbot to patent his calotype process in the United States and license it with Anthony acting as agent. This failed and Talbot finally sold the US rights to Langenheim in May 1849.

In late 1847 Anthony moved to 205 Broadway, to focus on photographic manufacturing, wholesaling, importing and publishing. Increased competition from the Scovill Manufacturing Company, which had entered photographic manufacturing in late 1839, during the 1850s forced him to start making daguerreotype cases and he began expanding his manufacturing base. A substantial new factory was opened in early 1853 making cameras, tripods and equipment and photograph cases. It made use of production line methods which allowed prices to be kept low.

In 1852 with the need for more capital his brother Henry T. Anthony (1814–1884) joined Edward as an active partner in the firm with responsibility for the manufacturing and technical side of the business. In 1853 sales had reached $250,000. The firm changed its name to E&HT Anthony & Co in 1862 reflecting the increased role of Henry within the business. The company was the largest producer of photographic chemicals and new photographic processes during the decade offered significant new opportunities to expand the business.

Stereography played an important role in the company's product lines from around 1859 when it began producing sets of stereocards supported by an extensive distribution and retail network. By the early 1870s up to 11,000 views were offered, both retail and wholesale. Anthony published Mathew Brady's Civil War views from 1862 with over 2000 images from Brady and others eventually being offered for sale. In the 1870s W.H. Jackson's views of Yellowstone were one of the most popular series and views by other well-regarded photographers such a Timothy O'Sullivan and Thomas C Roche, who had a long business relationship with the company, were also being published. As interest in stereography waned the last sets were published in 1880 and the firm moved into magic lantern manufacturing and began to publish extensive series of lantern slide sets.

The period from 1865 to 1880 saw further enlargement of the business with wet collodion equipment and sensitized materials being manufactured and the firm putting considerable efforts into expanding sales throughout the United States and in Europe. A new factory was opened in 1860 for manufacturing albumen paper and the albumen paper manufacturing facilities of Chapman and Wilcox were acquired making Anthony the principal maker of albumen paper in the United States. In 1863 it was estimated that Anthony purchased

over 15,000 reams of paper and used over 10,000 eggs. During this period it was producing up to 3600 *cartes-de-visite* of celebrities each day with 4000 subjects being available. The company's sales had reached $600,000 by 1866. By 1871 the *British Journal of Photography* was describing Anthony as 'the largest photographic firm in the world.' It had extensive offices and three large factories.

Photographic cameras and equipment had been manufactured extensively either directly or by others for Anthony from the 1850s and the growth of amateur photography from the 1870s and the introduction of dry plates encouraged the development of further lines of camera. Hand and pocket cameras for the amateur market played an increasing role in the company's product lines from the 1880s with the Schmid Detective hand camera of 1883 being the first of its type. In the late 1870s Anthony started importing dry plates from England and started production of its own Defiance dry plates in 1880 but the firm found it difficult to maintain quality and keep prices low.

Anthony began selling George Eastman's dry plates from 1880 with Anthony's marketing and distribution network offering Eastman an unrivalled opportunity to expand his new business. When Eastman started paper manufacture in a serious way in 1884 Anthony employed Frank Cossitt who had operated Eastman's coating machine to design a similar machine. Eastman severed his business relationship with Anthony in 1885 and an intense rivalry operated for the rest of the century with Eastman frequently resorting to law to restrain Anthony's activities in sensitised goods production.

After Edward Anthony's death in 1888 the company began to suffer financial difficulties partly as a result of the costs of Eastman's law suits and a severe fire in 1888 which affected the its manufacturing facilities. In 1891 Anthony concluded a financial arrangement with Thomas Blair of the Blair Camera Company selling some assets in return for Blair stock. However, the further merging of the two firms was restricted by Blair's outstanding court cases with Eastman. Other law suits that involved Blair and Anthony, and Eastman further strained the company. In 1899 Anthony attempted to sell its capital stock to Eastman for $268,750 which Eastman refused and other unsuccessful attempts were made in 1901, 1904 and 1905.

In March 1900 Anthony established new offices at 122–124 Fifth Avenue, New York In July 1901 it combined with Scovill and Adams to buy a controlling interest in the Goodwin Film and Camera Company. The two rival firms formally merged on 23 December 1901 to form the Anthony and Scovill Company which also brought together other American firms controlled or owned by the two principals. The dominance and influence of the Eastman Kodak Company and the cost of on-going litigation had convinced both parties that their strength lay in combining forces. The Ansco trade name which was used from May 1902 became one of the best known in the American photographic industry until the late twentieth century. A major reoganisation of the business in 1907 changed the business name to the Ansco Company.

During the twentieth century Ansco continued to try and compete with Kodak but with limited success. It merged with General Aniline Works Inc, the American branch of the German chemical giant I.G. Farbenindustrie Aktiengesellschaft, to form Agfa-Ansco in 1928 and with the outbreak of war it became, in 1943, a division of the Americanised GAF. The postwar period saw a continued decline and in 1978 the Ansco name was sold to W Haking Enterprises of Hong Kong.

MICHAEL PRITCHARD

See also: Morse, Samuel Finley Breese; Talbot, William Henry Fox; and Eastman, George.

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ANTHROPOLOGY

Both emerging in the second quarter of the nineteenth century, photography and anthropology have had parallel histories. Both changed radically in their range and capability by the end of the century and beyond as photographic technology became easier and the modern discipline of cultural anthropology emerged.

The boundaries of anthropological photography are not easily defined in the nineteenth century. Anthropology itself was not a discrete discipline but a fusion of scientists, travellers, folklorists, theologians, linguistics and archaeologists with a common interest in the study of mankind's cultural, social and biological dimensions. 'Anthropology' shifted meaning in the course of the nineteenth century and was used differently in different national traditions and at different times, terminology slipping between the terms 'anthropology,' 'ethnology' and 'ethnography.' In France 'anthropology' meant 'physical anthropology' as developed at the Laboratoire d'Anthropologie in Paris, whereas in Britain physical anthropology was usually called 'ethnology.' In Germany, as in Britain, 'Anthropologie' was initially the inclusive term, ethnography or *Völkerkunde* being the detailed description of manners and customs, whereas 'Ethnologie' came to mean 'folklore,' however 'Anthropologie'

came increasingly to mean physical anthropology as in France. In the United States the term 'ethnology' was eventually superseded by 'anthropology,' embracing physical and cultural anthropology and archaeology. These complexities of terminology were part of the search for methodologies to explain racial and cultural difference. Photographs made and used in these contexts were integral to this process. The shape of major collections of anthropological photographs were forged by these intellectual traditions for gathering and organising scientific knowledge and the specific political, economic and social agendas operating within the various national colonial policies and aspirations. For instance, German anthropological collections are generally founded on a more inclusive definition of 'anthropological interest' than British collections of the same date which include little travel photography which might be described as 'ethnographic,' such as that of Samuel Bourne or John Thomson, because it fell outside contemporary concepts of 'anthropological' data.

The dominant theories of cultural difference were evolutionary or at least progressivist—the best known and most influential being Darwinism. Within this culture was perceived as being biologically determined. Consequently photographs of culture were read through a racial grid and visa versa, in a way which makes it difficult to separate 'cultural anthropology' photographs from 'physical anthropology' or 'ethnology.' Closely related to other photographies of colonial expansion such as missions, travel and exploration, anthropological photography embraced both photographs taken with specifically anthropological intentions and those, because of their content, deemed to have 'anthropological interest' though they were not specifically scientific. The mutability of photographs gave them evidential value within different interpretative frameworks, In any case many photographs could be used as documents of both race and culture, for instance those of Japanese officials taken for the Musee de Paris by L. Rousseau and M. Potteau in the early 1860s. Much nineteenth century anthropological photography was thus defined through its subject matter and the way it was used rather than specific styles.

Whatever the different national and intellectual orientations in anthropology, photography was used with precisely similar intentions, to produce visual facts which combined the certainties of mechanical inscription with those of scientific observation. There were two interrelated purposes in the amassing of photographs. First, 'salvage ethnography' recorded cultural practices which were perceived to be 'dying out' in the face of inexorable cultural evolutionary advance. Second photography provided raw data which could be compared and contrasted within the scientific taxonomies of the day, by scholars in the interpreting centres of the universities and learned scientific societies of the Euro-American world. In these contexts, photographs were integral to the definition and reification of racial and cultural hierarchies. Yet there is a strong sense in which anthropological photography created its own object of study, focusing in the 'culturally pure,' primitive or traditional, excluding evidence of colonial influence or social change.

There were strong links between anthropology and colonial government. This was most marked in India. James Forbes-Watson and J.W. Kaye's great photographic compilation *People of India* (1868–1875) attempted to describe visually the people, manners and customs of the Indian sub-continent and their classification. Some of the earliest ethnographic books with photographic illustrations are on India, such as James Wilkinson Breeks *Account of the Primitive Tribes and Monuments of the Nilagiri* (1873). Although the systematic Ethnological Survey of India, suggested in 1882, was not realised until 1901, photography was nonetheless used extensively throughout the period to defined the colonial subject both racially and culturally. This relationship between anthropological photography and government was also more loosely instrumental in defining views of indigenous peoples in settler colonialisms of Africa, Australia and New Zealand.

Throughout the second half of the nineteenth century there were attempts to improve both the quality and quantity of data available to anthropologists. A number of publications gave guidance for collecting information, including the taking of photographs. Many specifically photographic instructions,, for instance those of Paul Broca in France (1864), were concerned with phyisical anthroplogy. The systematization of the social and cultural was more difficult, photography's utility in visualising such information was more often implied than explicit.

In 1874 the British Association for the Advancement of Science (BAAS) published *Notes and Queries on Anthropology* with questions ranging from physical anthropology to religious beliefs, marriage forms, morals, treatment of women, forms of greeting, presence of cannibalism, manufacture of pottery or the concept of art. The intended photographic section was never published, nonetheless questions elicited photographic responses; the earliest being by E.H. Man in the Andaman Islands (1876), who posed tableaux specifically to answer several questions about culture in one photographic frame. The third edition (1899) was the first to carry detailed photographic advice. Written by A.C. Haddon, it covered both technical matters, such as the problems of rubber parts in the tropics, and comments on the posing, aesthetics and social relations of photography. Similar methodological volumes and question lists appeared in France, although formal instructions

were dominated by the concerns of physical anthropology. In Germany, anthropology, with prehistory, was contained within broader instructions for scientific observation, *Anleitung zu wissenschaftlichen Beodbachtungen auf Reisen*. Produced under the auspices of Admiralty, first in 1875, this influential volume included detailed technical photographic instructions and discussion of desirable subject matter by Gustav Fritsch. Later instructions from Emil Schmidts (1888) and Felix von Luschan (1899) included photography within systematic field observation and collecting. Overall such manuals had the effect of structuring vision and thus photography through prescribing the significance of specific cultural traits.

In the United States the Bureau of American Ethnology (BAE) was founded by Act of Congress in 1878–79 to record and photograph America's indigenous cultures. As well as absorbing earlier photographs of Native American peoples, such as those by the James E.McClees Studio in Washington (1857–58), instructions were issued to photographers working for the BAE on the photographic procedures of portrait and genre studies. The first official photographer was John K. Hillers whose photographs of the Pueblos of the southwest (1879–82) combined scientific and aesthetic agendas. Between 1879 and 1888 anthropologists of the BAE were helped by professional photographers, such as William Henry Jackson and Charles Milton Bell. However after the Kodak revolution of 1888 anthropologists increasingly made their own photographs as part of fieldwork. Many of the great photographic documenters of indigenous culture of the late nineteenth century worked under the auspices the BAE at a time of profound change for Native American communities: James Mooney photographed the Cherokee and the Ghost Dances of the Plains (1890–91), Adam Clark Vroman and Victor and Cosmos Mindeloff photographed in the Pueblos of the southwest in the 1890s, the latter working with Frank Cushing of the Smithsonian Institution.

While the primary function of BAE was scientific, recording Native American cultured for posterity, there were also strong governmental agendas in gathering anthropological information, especially in the light of western expansion and the Indian Wars of the 1860s. By the late 1880s they had also become linked to national policies of cultural assimilation. Photographs made for anthropologist Alice C. Fletcher amongst Omaha for the New Orleans Exposition "Indian Civilzation" exhibition in 1885, typify this approach. The representations constructed cultural similarities, such as settlement and nuclear families, rather than stressing differences.

As elsewhere, outside the BAE, the universities and museums were also increasingly active in anthropology and thus photography. Franz Boas, perhaps the single most influential figure in the shaping of American anthropology, viewed photography as an important tool in his work. He both photographed himself and employed photographers, notably Oregon C. Hastings and George Hunt, a Kwakiutl photographer, to make images for him of, for instance, the Kwakiutl potlatches and Winter Ceremony from the mid-1890s on. Boa's cultural relativist view, which saw cultures as integrated wholes rather than a succession of comparable phenomena within an evolutionary framework, enlarged the potential for anthropological field photography.

Anthropological investigations encompassed not only other races but marginal groups at home: peasants, working class and internal indigenous groups whose culture was perceived as departing from an assumed norm. A wide range of material, from Knut Knudssen's photographs of the Sami of northern Scandinavia to Thomson's *Street Life of London* (1878), might be seen as inflected with anthropological ideas. While some were concerned with issues of class and criminality, others, through anthropology's study of culture and origin, were related to emerging national identities. Many European countries systematically documented their peasant cultures—France, especially in Brittany, Germany, Spain and Hungary. For instance, I.K. Inha's *Land of the Kalavala* (1890s) visualised the source of Finland's national epic, or indeed Sir Benjamin Stone, whose photographs constituted a cultural archive of an English past.

While many photographs were taken with anthropological intent throughout the colonised world, equally important were the huge numbers photographs of 'anthropological interest' made outside science, which became absorbed into anthropology. In France, Broca recommended those with scientific interests to purchase photographs of anthropological interest in the countries they visited. The learned societies, museums and universities who collected anthropological photographs provided a forum for the debate, viewing, collection and classification. Some were active in the dissemination of images amongst those with anthropological interests, such as the Berliner Gesellsachaft für Anthropologie, Ethnologie und Urgeschichte's project with Hamburg photographer Carl Dammann. This applied equally to internal ethnographies, for instance the 'Racial' Albums of the BAAS, which collected and classified carte de visite 'types' from all over the British Isles, from Highlanders to Suffolk flintknappers.

The large numbers of such photographs collected by scientists testifies to the anthropological importance attached to them. Cultural subjects by photographers such as J.W. Lindt, Kerry's Studios, J.W Beattie in Australia; Josiah Martin in New Zealand; Dufty Brothers, Burton Brothers, Thomas Andrew in the Pacific, Marc Ferrez in Brazil; Frank Rinehart and George B. Wittick in the U.S.; C. Kroehle in Peru, Lloyd & Co. or Middlebrook

Vroman, Adam Clark. Lah Poh.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

Studios in Southern Africa; Bonfils' and Zangaki's Studios in North Africa and Middle East, Felice Beato in Burma and Japan—found their way into scientific collections in a research resource. Such photographs occupied the cusp between the popular and the scientific and photographers marketed their work, some times aggressively, in both markets. In many cases, the anthropological legitimated popular images of the exotic and erotic. Such photographic productions are found, repeated through many major collections, suggesting the global scale of the circulation of 'anthropological photographs'.

By the end of the century a clear break emerged between the amateur and antiquarian and the professionally trained university or research institute-based anthropologist who combined field study with clear theoretical analysis. This development was, in general terms, common to the various anthropological traditions and was reflected in the way in which photography was both produced and used in anthropology. The anthropological validity of commercially produced photographs of "native types" and scenes declined. Increasing stress was laid on photographs which resulted from direct scientific observation. Linked to this were shifts in photographic style from the controlled scientific specimen and its popular derivatives to a more naturalistic approach. These were exemplified by two papers which appeared in the pages of the *British Journal of the Anthropological Institute*. In 1893 Everard im Thurn (who photographed extensively in British Guiana from the late 1870s–90s) advocated the anthropological value for photographs of people in their natural conditions made from direct observation. A different view was presented in 1896 by M.V. Portman He advocated the arrangement of 'culture' within the photographic frame as visual answers to the questions in *Notes and Queries*, the approach he had used in his studies of Andaman Islanders. By the 1890s unmediated naturalism was becoming the dominant truth value in anthropological photography. In many ways these concerns resonate with debates concerning naturalism and intervention within the wider photographic community.

In photographic terms this was aided by increasing technical ease, although anthropologists tended to use well-built cameras and glass plates until well into the twentieth century because of the instability of film negatives in tropical climates. However, the possibilities for 'action' photographs by the 1890s accorded with emerging ideas of scientific truth premised on direct observation. This is demonstrated in the work of the BAE, for instance Matilda Coxe Stevenson, working with BAE stenographer May Clark, used a Box Brownie extensively at Zuni in 1891, producing snapshots of everyday life. material culture and ritual. The interdisciplinary university or museum-based expeditions with large photographic outputs became an important aspects of anthropology at this period, especially in the German and America traditions. The 1897 Jesup North Pacific Expedition, under Boas, used photography to record a whole range of daily and ritual behaviours, some of which were specially re-enacted for the camera and as was often the case with expeditions, photography was integral to the collecting of material culture for museums as well as the social description of indigenous peoples. The Second Cambridge Expedition to the Torres Straits of 1898, under A.C. Haddon, is especially important because of the centrality of the visual to its interests. As well as exposing over 500 photographic plates, they took first anthropological film to be made in the field and had hoped to experiment with colour photography using the Ives and Joly process (which fell victim to the travelling conditions and the tropical climate).

Increasingly, the dominant way of working in the early twentieth century, was that of the work of individual fieldworker. For instance, Baldwin Spencer and Frank Gillen produced photographs as a result of long acquaintance with the Aboriginal peoples of Central and Northern Australia from 1894 on, and the German Fritz Sarasin worked in with Veddah people of Ceylon (Sri Lanka), recording everyday culture in the 1890s. The emphasis in all these examples, and other contemporary

projects, was on direct field observation. It translated into an apparently naturalistic, non-interventionist photographic style, in which minimal aesthetic control was integral to its truth value within a recognisably proto-modern field method. However the individual colonial ethnographers continued to make photographs which became absorbed into anthropology, for instance the German Richard Parkinson, a planter and trader, who made a compelling series of photographs of the culture of the Bismark Archipelago. The two methods of anthropological photography did not finally disentangle until well into the twentieth century.

The role of anthropological photography in the public realm was also significant because it had a profound influence on contemporary perceptions of race and culture. Science was used to legitimate a wide range of cultural stereotypes and their photographic manifestations, although science itself had contributed to these ideas. The expositions, world fairs and music halls of the nineteenth century were important sites for both public dissemination of cultures and their photography. These cultural displays imported groups of indigenous peoples from all over the world. They 'performed' their culture in reconstructed villages on the exhibition site, many displays becoming more lurid and exotic as the century progressed, further reinforcing racial and cultural stereotypes. Nonetheless, they were also seen as sites of serious anthropological science. Photographs were made with both a scientific and popular audience in mind. The 1893 Columbia World Fair in Chicago, for which Boas was anthropological advisor, featured many cultures including Native Americans and Samoans. Photographs sold both as a book, *Portraits Types of the Midway Plaisence*, and as picture postcards. This dissemination extended the photographic focus of earlier shows for instance Prince Roland Bonaparte photographed Omaha people at the Jardin d'Acclimatation in Paris in 1884, and Australian Aboriginal group at the Folie Bergéres (1886), and Carl Gunther's photographs of Bella Coola from Canada's Pacific coast taken in Berlin in 1885.

Publications of popular anthropology such as Tylor's *Anthropology* (1881) or Friedrich Ratzel's *Völkerkunde* (1894) were illustrated with engravings made directly from photographs, which functioned as as an index of their truthfulness. The introduction of the half-tone brought about further dissemination of anthropological photographs. By the turn of the century there were many heavily illustrated educational magazines such as the British *Living Races of Mankind* (1902–3), or in France *Science et Nature,* or *L'Journal illustré*, which drew on the collections of anthropologists and learned societies. Anthropological photographs also were extensively disseminated as lantern slides at public lectures. For instance Cambridge anthropologist A.C. Haddon gave public lectures on 'Savage Life in New Guinea' or 'The peoples of North America' using photographs from his own field research. The dissemination of images of 'anthropological interest' also increased from the 1890s by the global market in picture postcards.

By the early twentieth century shifts in disciplinary practice brought about major shifts in the production and evaluation of anthropological photographs. The diversity of cultural behaviour, the subjectivity and random inclusiveness of photography meant that attempts at the systematisation proved impossible. The truth of anthrpological photography not only lay in its indexicality but increasingly in the contexts of its making. Although huge numbers of anthropological photographs continued to be made, photography was relegated largely to a visual notebook. The stress in scientific anthropology was on the observation of the trained fieldworker—the eye of the fieldworker, not the camera, become the site of anthrpological truth.

ELIZABETH EDWARDS

See also: Ethnography; Bourne, John Cooke; Thomson, John; Hillers, John K.; Kodak; Hunt, Robert; Zangaki Brothers; Beato, Felice; and Notes and Queries.

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APPERT, EUGÈNE (1830–1891)

French artist, photographer, and photomontagist active during the Paris Commune (1871).

Ernest Eugène Appert was born in the Pays de la Loire, Maine-et-Loire, Angers, France on 1830. In 1869 he became an independent photographer and painter. Because he had no sympathy with the communards, the rebels participating in the Paris Commune in the spring of 1871; he produced a series of fake Versaille-propaganda photomontages called 'Crimes de la Commune'. Appert was the genius behind a whole series of photomontages meant to discredit the communards. It is likely that his images were not of actual people protesting, but instead of staged shots with actors.

After the rebellion, Appert took the portraits of hundreds of the individual communards while imprisoned in jail. He was not assigned this job by the authorities, but took the initiative upon himself to do this, which also happened to have a commercial motive. Indeed, his photographs were eagerly purchased and reproduced once and again. The police also benefited from his images by including them in their card indexes. Perhaps though Appert was attempting to photograph 'physiognomy,' which around 1870, became a very popular pseudo science, based on the idea that a person's physical appearance could convey his or her character and personality. Appert died in 1891 in the Provence-Alpes-Côte d'Azur, Alpes-Maritimes, Cannes, France.

JOHAN SWINNEN

ARCHER, FREDERICK SCOTT (1813–1857)

British sculptor, photographer, and inventor

Frederick Scott Archer was born in 1813 at Bishops Stortford in the English county of Hertfordshire. He was the second son of a butcher. Both Archer's parents died during his childhood leaving him to be brought up by friends and relations. While a boy he was apprenticed to a silversmith and bullion dealer, Massey of Leadenhall Street, London, who traded in antique gems and coins. Archer studied numismatics and became specialised in giving valuations. However, the artistic design of the coins, rather than their commercial value, interested him most inspiring him to copy their designs by modelling. It was this work which led him to make portrait busts and eventually to set up as a sculptor in Henrietta Street, London.

In 1823 he attended the Royal Academy Schools (RA) at the recommendation of the numismatist and keeper of coins, medals, prints and drawings at the British Museum, Edward Hawkins. From 1836 until 1851 Archer exhibited at the RA numerous works in sculpture. These were mainly busts of well-known people, such as the musician Sir George Smart (1839); the Dean of Manchester (1848); the Marquees of Northampton (1850); portrait medallions of the engineer Sir Isambard Marc Brunel (1841, 1842), and miscellaneous narrative or historical subjects *Falling Angels* (1836) and *A Young Briton Receiving Instruction* (1848). The sculpture *Alfred the Great with the Book of Common Law* was exhibited at Westminster Hall in 1844 to mixed reviews. His wall monument to Lady Albert Conyngham (1850) for Mickleham Church, Surrey, carved in the form of an urn, was illustrated by an engraving in the *Gentleman's Magazine* for May that year but was criticised as having been "too servilely copied from the antique" (510–11). Most of Archer's works in sculpture remain untraced in 2001.

Archer was often in poor health and it was through his doctor and friend, Dr Hugh Welch Diamond, a keen photographer, that he was introduced to William Henry Fox Talbot's calotype process in November 1847. Initially Archer used the photographic medium as an aid to sculpture to record his finished work and probably to photograph sitters from which he could model busts. He became increasingly fascinated with photography to the exclusion of sculpture and became an early member of the Calotype Club (from 1848 referred to as the Photographic Club). At that time the two main photographic processes in existence both had limitations. Daguerreotypes were highly detailed but required long exposures and produced a "one off" positive image; the calotype allowed many prints to be made from one negative but these were produced on paper and were therefore not as sharp. Archer wrote in *The Chemist* (March 1851, 257) that he was unhappy with "the imperfections of paper photography" and of his endeavours to find a negative material possessing "fineness of surface, transparency and ease of manipulation."

From 1848 Archer began experimenting with glass as a negative support. A light-sensitive coating of albumen (egg white) on glass had been used by others with some success but the solution was difficult to spread smoothly and was extremely delicate. Archer experimented instead with collodion. This was made from guncotton, a powerful explosive invented in 1846, produced by soaking ordinary cotton in nitric and sulphuric acid. This substance was then dissolved in a mixture of alcohol, ether and potassium iodide to produce the syrupy collodion that could be poured onto glass. This plate was then sensitised in a bath of silver nitrate solution and exposed in the camera while still wet. Archer's findings were first published in the *Chemist* in March 1851 in a communication dated 18 February. The new process was much faster than the calotype, reducing exposure times to seconds rather than minutes. It was also less expensive to produce than the daguerreotype. Importantly, it allowed superbly detailed negatives to be made of a

quality never before seen. By printing the new negatives on albumen paper new aesthetic possibilities and practical applications for photography were opened up.

Archer gained permission to show a few of his collodion negatives which were displayed to acclaim a few days before the closing of the 1851 Exhibition at the Crystal Palace, Hyde Park, London (*The Photographic Journal*, 1862, 149). Horne, Thornthwaite and Wood, opticians and philosophical instrument makers of London, arranged with Archer to sell his iodized collodion and took out newspaper advertisements in the autumn of 1851. Despite demand from other opticians and chemists Horne and Thornthwaite continued to be the sole distributor for several months. That same year an early enthusiast for Archer's process, Robert J. Bingham, photographed the prize winning exhibits of the Paris Industrial Exhibition to produce some 2500 collodion negatives in a comparatively short time. This convinced many other photographers of the practical viability of collodion beyond doubt despite the cumbersome equipment required for exposing the wet plates and developing them on location. Collodion photography gradually displaced most other processes and was prevalent from around 1855 to 1881 when it was superseded by the more convenient gelatin dry plates.

The widespread use of the wet collodion process can also be attributed to the fact that Archer did not patent his invention but shared his findings with fellow photographers and published it freely with no profit to himself. By contrast, throughout the 1840s and the early 1850s, Talbot maintained a stronghold over the licence of his calotype process and threatened legal action against those who breached his copyright. Martin Silvester Laroche refused to pay a license after Talbot challenged him which led to the court case of Talbot V. Laroche in 1854. In the case Talbot claimed that Archer's wet collodion method, being essentially a negative / positive process like his own, came under his 1843 calotype patent. The verdict was that although Talbot should be recognised as the inventor of the negative / positive process Archer's discovery was not covered by the calotype patent and thus free for all to use without restriction.

However, there were suggestions that Archer was not the only inventor to have come up with the idea of using collodion on glass. Bingham claimed that 'In a pamphlet on photography, which I published in London in January, 1850, I mentioned the employment of collodion in photography, and communicated the secret of this discovery to the most distinguished photographers of London' (*The Chemist*, July 1852, vol.3, no.34, 458). Archer did not dispute that others had suggested the possible use of collodion before him but he claimed priority to the publication of its practical application. In *Notes and Queries*, (1852 vol. vi, 612) Archer responded to a correspondent who ascribed the discovery of the collodion process to Gustave Le Gray:

> I was certainly the first who published the mode of using it, and gave the required proportions of the various chemicals necessary in the process. I have been repeatedly advised to advertise it as the Archerotype, but I was unwilling to do so, not because I doubted my right to the name, but I was satisfied with the general recognition of my claims, and left others to name it for me. Had I done it myself at once, the invention at this late hour would not have been claimed by another.

Archer was usually unassertive about his invention because he was a shy man. His character is described in *The British Journal of Photography* (5 February, 1875, 65) by a contemporary, John Beattie, a Bristol daguerreotypist who visited him in 1851 to enquire about the collodion process:

> Having got Mr. Archer's address, without any introduction but the simple plea of my curiosity and desire for knowledge, I called upon him. … I met a thin, pale-faced, over-thoughtful man, possessing a manner so free, unsuspicious, and gentle, that in a few minutes all idea of my being and intruder was entirely removed. … He was profuse in description (as if I had paid him a fee) and ended with the words, 'Perhaps you would like to see me make a picture?' … But Mr. Archer's generosity did not end there. He wrote me a list of chemicals which I was to procure, and told me to use his name at Horne and Thornthwaite's … He shook me by the hand as warmly as if I had been obliging him.

Archer chose to demonstrate the powers of the wet collodion process himself with images made in 1851 of the ruins of Kenilworth Castle, near Warwick in central England. Its red sandstone remains date from the various periods in its history from the twelfth to the sixteenth century. It was depicted by the watercolour artists of the late 18th and early 19th century such as Thomas Girtin, J.M.W. Turner and Peter De Wint who pointed the way to such suitable subjects for the new art of photography. Walter Scott found inspiration in the castle for his popular novel *Kenilworth* (1821). It was therefore an evocative location well known to the Victorian public for its romantic, medieval associations. The young Pre-Raphaelite painters such as John Everett Millais, and those associated with the movement such as John Inchbold, concentrated on paintings of minute detail in the early 1850s of vegetation encroaching on ruins. It is interesting to note that these artists' tastes for meticulous, lifelike observations corresponded with the exactitude that Archer's wet collodion negatives likewise allowed. His images of the castle are among the earliest photographs of the genre of ruined buildings that continued to be a popular subject for photographers throughout the 1850s and 60s.

Archer exhibited work in the first exhibition de-

voted exclusively to photography held in 1852 at the Royal Society of Arts. He was active in exhibiting many works at the photographic society exhibitions in Dundee (1854); Glasgow, British Association for the Advancement of Science exhibition (1855); Norwich (1856); Yeovil (1856) and London (1854, 1855, 1856, 1857). His numerous picturesque landscape and architectural subjects included views of locations such as Tintern Abbey, Warwick Castle, the Cambridge colleges, Rochester castle and cathedral, St. Albans and scenes on the Thames, in Wales and Monmouthshire. Prices for Archer's prints ranged from £1 and 1shilling to £1 and 15 shillings.

During the early 1850s Archer moved to 105 Great Russell Street, Bloomsbury, London to set up a business in photography. It was here that he published a full account of his invention, *Manual of the Collodion Photographic Process* in two now rare editions in 1852 and 1854 (copies are held at the British Library, The Gernsheim collection and the Museum of the History of Science, Oxford). In 1852, together with Peter Wickens Fry, Archer also devised the collodion positive, or 'Ambrotype' process which became extremely popular for portraiture. This was a variant of the wet collodion process in which an underexposed negative was backed with black paint, paper or velvet resulting in a unique positive image often presented in a velvet-lined, plastic or leather case. While Archer gained very little commercial success as a photographer he maintained his living working precariously as an inventor. His inventions included a camera inside which the various developing processes for the calotype could be self-contained (later adapted for Archer's own collodion process by his friend William Brown) and a variety of types of lenses. In 1855 he devised a technique for stripping off the collodion image and transferring this to other supports such as cloth and leather for which he was granted British patent number 1914.

Despite his significant contribution to photography Archer died in poverty on 2 May 1857 and was buried in an unmarked grave in Kensal Green Cemetery, London. *The Journal of the Photographic Society* (21 May, 1857, No. 54, 269) noted:

> Another victim has been added to the long catalogue of martyrs of science. Mr. Frederick Scott Archer, the true architect of all those princely fortunes which are being acquired by the use of his ideas and inventions, after struggling for some time for bare existence, has now departed from among us …

A subscription list, the Archer Fund, was established on 21 May by his friends Roger Fenton and John Mayall with other members of the Photographic Society of London, for the benefit of his family. However, Archer's widow died the following year and the subscription was closed in August 1859 with just £767 collected. His three children were granted a pension of £50 from the Civil List due to their father's photographic discoveries which it was noted had saved some £30,000 in the production of Ordnance Survey maps alone.

Archer's photographs remain scarce in 2001. The Royal Photographic Society collection contains thirty-three albumen photographs including an album of the Kenilworth Castle views. Also early experimental collodion positives printed on glass, cloth and leather, a wet collodion plate camera from 1852 and a collodion positive portrait of Archer (1855) by Robert Cade. A view of Sparrow's House, Ipswich was purchased in 1856 from the London Photographic Society Exhibition of that year by Henry Cole, the first director of the South Kensington, later Victoria and Albert Museum, London and remains in that collection. Further Archer material exists in the Gernsheim Collection, The Harry Ranson Humanities Research Center, University of Texas, Austin, USA. Six or Archer's Kenilworth views were offered for sale from the collection of the Earl of Craven (an early practitioner of the wet collodion process) in 2001 (Bearne's, Exeter, 12 May 2001).

Martin Barnes

Biography

Frederick Scott Archer was born in 1813 at Bishops Stortford, Hertfordshire, England. His career began as a sculptor in London but he turned to photography from 1847. He experimented with making negatives on glass and in 1851 published his process of wet collodion which revolutionised photographic practice with its rapid exposure times and ability to render fine detail. Archer chose not to patent his process and allowed it to be used freely. The same year of his invention he photographed with it the ruins of Kenilworth Castle, England. Thereafter the wet collodion process was adopted quickly world-wide and became the dominant form of photography throughout the 1850s until the 1880s. From 1852 to 1856 he exhibited numerous works at the photographic society exhibitions in London, Dundee, Glasgow, Norwich and Yeovil. While gaining very little commercial success as a practising fine art photographer Archer continued to work on inventions at his premises in Bloomsbury, London where he also published two manuals of the collodion process (1852 and 1854). His other inventions included improved cameras, lenses and photographic processes such as the collodion positive, or Ambrotype—a variant of the wet collodion process—which became widely used for portraiture. Despite his significant contribution to the advancement of photography Archer died in poverty in London on 2 May 1857.

See also: Wet Collodion Negative; and Calotype and Talbotype.

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ARCHITECTURE

Architectural photography is the depiction of buildings, their details, and their models. The representation of architecture in images is as old as painting and drawing. It had to fulfill a number of purposes, from the portrayal of castles for their proud owners (as in the Books of Hours by the Fréres Limbourg in the 14th century) over the documentation of historical structures (as in the drawings of Renaissances masters) to the autonomous subject (as in Dutch paintings of church interiours of the 17th century or in the 'Carceri' by Gianbattista Piranesi (1749/61)). As with writings on architecture, the representational delineation is not needed for the architectural process itself but is a matter of communication between laymen (and sometimes architects). This development is also responsible for painting and etching traditions of the 18th century, like the vedute which formed a common ground for the aesthetic invention of photography in both style and subject.

In the first art-critical account of the new technique, Jules Janin referred to the bible by forcing the towers of Nôtre Dame de Paris: "Become image!" With this short sequence, he combined two lines of interest—the new form of depiction not yet named photography, and building preservation, recently instigated as a common bourgeois concern by the Victor Hugo's novel on the cathedral of Paris. After Janin, every author on the invention of photography had to refer to the delineation of architecture for which the new medium seemed to be most appropriate. On the other hand, most inventors had introduced another motif unconsciously: the view on or through the studio's window. This was the utmost of romanticism as it defined the limitation of human vision by the individual eye, even on the base of a perspectively correct delineation. Both themes can be traced throughout the early history of architectural photography by a comparison between the daguerreotype and the calotype.

The daguerreotype with its over-exact details piqued the interest of scientists like the French Dominique François Arago or the German Alexander von Humboldt who emphasized its depicting qualities with the description of strays on a window sill. When the first set of cameras were delivered to Prussia, the first subjects of the new technique were buildings in and around Berlin. The photographs were not only of old buildings photographed as a method of preservation, but also of newer ones like Schinkel's new museum. Until the introduction of the wet collodion process, there was no doubt within Central European photography that the delineation of architecture belonged to the daguerreotype. This was not so for the United Kingdom and some of the American pioneers in photography: long pictorial traditions in landscape painting and aquatint graphics had settled an emphasis on the view "through the looking glass" and therefore concentrated on aspects full of atmosphere. This can be traced in the Scottish albums by William Henry Fox Talbot as well as in early attempts of David Octavian Hill and Robert Adamson.

In 1845, the young art critic John Ruskin spent a number of months in Venice studying the wealth of Gothic architecture. After seeing a daguerreotypist's work, he had his servant learn the technique and then used those images as proofs of his findings. He drew reproductions of the photogrpahs and then printed those drawings in his books on the 'Stones of Venice.' The book's transformation of architectural images from daguerreotype to etching was not entirely new as Noël-Marie Paymal Lerebours had already published his 'Excursions Daguerriennes,' surely known to John Ruskin but not regarded as sufficient help in his own field. The landmark in both architectural and photographic history set by the 'Stones of Venice' is that the author would not have been able to settle his argument without the aid of the new technique which was not yet a medium. It is exactly because of this, however, that the 'Stones of Venice' preserved no historical photographs of the architecture it represented.

In Ruskin's case, the time from taking the pictures to their publication was more than eight years, during which technical evolutions had accelerated substantially.

The wooden boxes and brass tubes of the earliest camera constructions had shaped into an unfoldable ‚traveling camera' which allowed separate movements of both the plate and the lens holder for perspective corrections. There were developments in the preservation of buildings, also. In 1837, the author and politician Prosper Mérimée had founded the 'Comission des monuments historiques' financed by the French state, and in 1838 he suggested an inventory of all buildings worth preserving. When the invention of photography was announced in January 1839, the forthcoming inventory was feeded by the hope to include images of these buildings, as was decided in the commission's meeting in March 1839. It took nearly ten years until Hippolyte Bayard was commissioned with the first few photographs of the restoration works at the cathedral of Nôtre Dame in Paris. Finally in 1851, the commission founded the first photographic documentation project: the 'Mission héliographique.' One of the founders was Léon de Laborde who in the same year of 1851 co-founded the Société héliographique whose interests were concerned with the publication of photographs that were important for commissions like the 'Mission'.

Six photographers received contracts for the 'Mission' in 1851: Edouard Denis Baldus who subsequently was to become Europe's first professional architectural photographer; Henri le Secq who already had taken images of the mediaeval cathedrals of Amiens and Reim; and Gustave le Gray who came from the Barbizon school of painting and was an acclaimed practicioner of photography. Hippolyte Bayard's earlier contract was renewed, and little in known about the fifth man, O. Mestral. A year later, the sixth photographer, Charles Nègre was installed by a new contract. As with le Secq and le Gray, Nègre had been a painter before and studied with Paul Delaroche, even so, his contribution to the 'Mission' remains somewhat elusive. The six photographers received lists of buildings taken from the 'Annales archéologiques'—the most important periodical of its field—and delivered roughly 150 photographs by the end of 1852. From then on, the Commission seemed to have lost its interest in commissioning documentary images but started to buy them from different sources like the Parisian scenes mainly from Charles Marville. At the same time, the Commission began to re-finance this program by selling prints loose or in albums. When the 'Mission héliographique' officially ceased to exist in 1880, there were some 6,000 photos on sale.

There is no other project like this in the history of architectural photography but, of course, there were a number of self-commissioned documentations on buildings worth being preserved by photography. William Henry Fox Talbot with the partnership of David Octavius Hill, Robert Adamson, followed by Benjamin Brecknell Turner, Thomas Keith, Thomas Sutton, and Roger Fenton formed the nucleus of the, Architectural Photography Association' which exhibited twice in London in 1858 and 1859. The first self-commissioned documentation with a scientific approach in art history in Germany was a comprehensive album created and printed in 1856 by Hermann Emden. It showed the interior and sculptures of the cathedral at Mainz. His efforts were prolonged by the work of Carl Friedrich Mylius, Friedrich Ferdinand Albert Schwartz, and Georg Boettcher in the German countries, by George Washington Wilson in Scotland, by Humbert de Molard and André Giroux in France, by Giacomo Caneva in Italy, and by a fast growing number of practicioners in each European country with relics of history. Even if all of these photographers started their work from an interest in preservation, they gradually were swept into a world-wide phenomenon that became the main result of architectural photography for the 1850s and 1860s: tourism.

Travelling the Grand Tour through Europe and around the Mediterrean Sea had become an integral part of any cultural education—if there was money enough in the family. By the efforts of a growing number of agents in the mid 19th century, the Grand Tour gradually altered into the forms of group tourism still well known today. Tourists often visited the cultural highlights of a country and then retreated to a resort for personal comfort, all within one travel. Also, everybody needed souvenirs as mnemic aids for later accounts of the travel to the family and neighbours. Photographs were obviously the best possible means of remembering, often representing the scenes visited with hitherto unknown accuracy. Travel photography was comprised of more than only architectural subjects but the main depiction of monuments seen consisting of buildings and places, and the conventions of travel photography were set by the first architectural photographs made of each edifice. Concerning the difference between architectural and archaeological interests in preservation of buildings and the use of the same motives for travel souvenirs, one has to consider a tiny time gap within the early 1850s, exactly at the same time the 'Mission héliographique' was on its way in France.

After Lerebours' photographers and their, more or less, vain attempts to collect the most important buildings of the world in the 'Excursions Daguerriennes' in 1839 and 1840, there was nearly a decade without photographic excursions. This was due, in part to the technical differences between the exact but unprintable daguerreotype and the reproductable but inexact calotype. Salt printing processes, however, had by 1850 developed a technical quality which enabled a number of photographers to travel with a camera. August Salzmann went to Palestine, John Shaw Smith, John Beasly Greene, and Maxime du Camp travelled to Egypt, and

Roger Fenton went to Russia, just to name a few out of dozens. They were accompanied by true amateurs seeking the splendour of antiquity in ruins depicted in the best quality possible. Among them are Robert McPherson, Frédéric Flacheron, and Jakob August Lorent in Italy, James Robertson in Greece, Wilhelm von Herford in Egypt, Wilhelm (Guilleaume) Berggren in Constantinople, and Désiré Charnay and Paul de Rosti in Mexico and Brasil. Most of these photographers had either been painters before and therefore developed an interest in the aesthetic qualities of ruins as a base of their drawings and studies, or they were archaeologists and art historians by training. One exception is the Prussian diplomat von Herford who refers to the large number of British amateurs in India, mostly military officers: Linnaeus Tripe, Captain Biggs, John Murray, and later John Burke and Melville Clarke.

The introduction of the wet Collodion process and the albumen print in the early 1850s brought the technological shift for photography from an artistic practice towards a medium of visual communication. Immediately, early entrepreneurs like Louis-Désiré Blanquardt-Évrard and Adolphe Braun star—among them a number of titles with architectural photographs. From the mid 1850s onwards, the production of larger quantities of copies reached a semi- industrial status; the times of the well-known suppliers of travel photographs began. Be it the brothers Alinari in Florence, Giacchino Altobelli in Rome, Carlo Naya and Carlo Ponti in Venice, Giorgio Sommer in Naples, Giacomo Brogi and Constantino Brusa in Milano, or the Studio Incorpora in Palermo—only for Italy one can easily name more than a dozen studios, each of them sending out dozens of their own photographers and processing thousands of prints a month by hundreds of employees. Within three decades, the brothers Alinari piled up a stock of 150.000 pictures; at least, one quarter of these are architectural photographs.

Important names and countries in this field include William J. Stillman, Petro Moraites and Dimitrios Constantinou in Greece, J.Pascal Sebah and the brothers Zangaki in Constantinople, Tancrède Dumas in Beirut, Francis Frith, Wilhelm Hammerschmidt, Antonio Beato, Désiré Ermé and the Bonfils family in Egypt, Charles Clifford and Vicomte Vigier in Spain, Charles Shepherd, Samuel Bourne and Lala Deen Dayal in India, John Thomson and Felice Beato in China, the latter in Japan where he sold his establishment to the Austrian Baron Raimund Stillfried who gave his studio to Kusakabe Kimbei. The stylistic approach of the architectural photographs from all of these sources is rather conventional and responsible for most of all forms of architectural photography still today. The building or complex is accessed by panoramic views from a higher stand-point. Then there are strictly axial views of each important facade from a middle height, followed by a number of details in ornament, doors, or sculptural additions. The scenes are mostly lit with bright sunlight and strong shadows, although the heavens stay white due to the emulsions' unsensitivity. A common practice these days was the combine printing of the architectural view with one or two negatives of cloudscapes fitting the subject and light given. Personnage is found on most images of architecture; as in industry, the humans depicted function as measurements of the edifices.

Travelling and collecting travel photographs was reflected in architecture after a short while - historism was the clear determination of the earlier preservation campaigns. "In which style should we build?" was the main question of the 1850s to World War I, and it was answered by the use of architectural photographs. Industrialisation and the movement of people from the land into the cities in the middle of the 19th century caused the erection of new quarters and buildings, and for this purpose architects were needed. Nearly all European countries installed a university specializing in training architects after the model of the Parisian Académie des beaux arts, and a growing number of Americans came to Europe to study, like Henry Hobson Richardson. The young architects of the early 19th century studied after the plans and portfolios of Jean-Nicolas-Louis Durand, and they now began to work from larger collections of photographs—mainly from the sources of travel photography but as well from local compendia like the 'Mission héliographique' or the new collection of the South Kensington museum.

When students started their own trips around Europe and the Mediterrean Sea to study architecture old and new, they drew after the originals and establish collections of images—and when some of these students became teachers, again these collections formed the ground of each curriculum. Gradually photography crawled into these collections, not only as a help in producing studies in perspective, but as a base of exact measurement, too. An integral part of study in architecture was an exact account of one building, like mediaeval cathedrals, cloisters, or antique structures and ruins. These accounts were to be delivered in outlines, transverses, and orthogonal projections of each frontage—the most hated work in the education of an architect. One of these students, Albrecht Meydenbauer, after a severe accident decided to introduce photography into this process of accounting. Architectural photogrammetry was born, the use of military cartography for the reconstruction of buildings. To finance his project which consisted of documenting, exactly every important historical building in Europe, Meydenbauer not only established the Preussische Messbildanstalt in Berlin but offered his photographs in subscription sales to universities, administrations, and private investors. When the Messbildanstalt was

Baldus, Edouard. Biblioteque Imperiale du Louvre.
The Metropolitan Museum of Art, Purchase, The Horace W. Goldsmith Foundation Gift, 1994 (1994, 137). Image © The Metropolitan Museum of Art.

closed in 1917, it owned a stock of more than 21,000 pictures in extremely high definition, most of them in the negative format of 40 × 40 cm.

Writing up the history of architectural training and practice in the second half of the 19th century, one can divide the exemplary images used within the common curricula into two structural components: the Messbild photographs and the collections of the 'Mission héliographique' and its successors; or the plans of Jean-Nicolas-Louis Durand as structural base of a new construction. Due to the new contruction at this time, the teachers and their students didn't have examples of edifices. Those planning and wanting to build houses needed examples to explain their wishes to their architects. After the erection, proud house owners ordered images from photographers to show around to their friends and family members. Large projects often requested an album dedicated to financiers and share holders—this tradition was started by the Baron Rothschild who commissioned Edouard Denis Baldus in 1853 to photograph all stations of the new railroad line between Paris and Toulon, and the tradition was prolonged by Prince Albert when he asked Philip Henry Delamotte for a complete record of the Crystal Palace's re-erection at Sydenham in 1854. Be it the Suez Canal, the line of bridges crossing the Rhine, any of the great Western railroads in the United States, or a construction hall at one of the Parisian world fairs, since the late 1850s each construction of great importance was photographed and had an album made from its image. Although they represent a common practice of their days, the most remarkable and widely published series of this kind is the album that Hyacinthe César Delmaet and Louis-Émile Durandelle photographed of the construction of Philippe Garnier's Paris opera house.

A predominant convention was that every large scale project that recieved country- or world-wide fame was imitated by those working on smaller scales. No court

house, town hall, opera house, musical theatre, bank or industrial site was opened without a luxuriously designed album of photographs showing facades and details, and sometimes images of the work in progress. Little is known about the photographers of these albums; in most cases they were local practicioners of the art with a good basic knowledge about the angles and light conditions to photograph buildings, but had little care of compositional structures developed in 18th century vedute imagery or in 17th century architectural painting. They saw their craft in portraiture, and thus most of their images tend to please their buyers as did average studio photography. But, as sets of portraits of important people were published with great success, some publishers thought of producing collections of recent buildings, sometimes with a certain success. In the late 1860s one could buy such collections as phototype prints in larger portfolios of what was named 'modern housing,' at least in cities like London, Paris, Berlin, New York and Chicago.

American cities, both on the northern and the southern continent, were looking for industrial entrepreneurs to settle in their environments. From the late 1860s on, one can find larger and smaller portfolios of these cities showing the beauty of their surroundings, the quality of their traffic connections, the opulence of their town halls, churches, or assembly buildings. Mostly these—anonymously manufactured—portfolios were conceived as leporellos with a panoramic view of 360° in twelve images on the front and twelve singular images showing individual edifices on the back. Today, these leporellos often mark the earliest records of the existence of these cities. They were shown and distributed at fairs and promotional tours through Europe. The last of these portfolios, made around 1900, show a new type of important construction—grain elevators which, through this form, found their way into European modernism. On the other hand, a pictorial representation was often necessary requirement of technical constructions like large bridges and railway installations not only for the financiers but for the copyright of the engineers as well. American and Canadian photographers like George N. Barnard, Timothy O'Sullivan and William Notman proudly recorded the wonders of technical engineering around the railroad lines, and some of their images look as modern as pictures from avantgarde constructivism of the 1920s. Photography even fulfilled a proof function in the test of a bridge construction. When a large arch of a bridge was spanned over a river or a valley, two photographs had to be made of it: one under the pressure of several locomotives on top of it, one without. If the difference of height between the two photographs was toomuch, then that indicated that the bridge had to be strengthened.

The practice of advertising new edifices by photographic reproductions was not only used by local authorities but also by the architects themselves. The architect Henry Hobson Richardson, who owed an important part of his vast success in the New England states to the fact that each of his new buildings was immediately published by magazines like *The American Architect*—at his own cost. Amongst Richardson's large collection of photographs were pictures whose composition was developed from specific criteria determined by himself. In these photographs, he gave the photographers working for his office specific directions on how to choose their stand-points and perspectives. Country houses designed by Richardson had to photographed from a low angle to make them more impressing, but the large Chicago department store which was his last design had to be shown from a middle height to give the impression of just another block in the city. Court houses, churches and town halls designed by Richardson were shown like singular masterpieces without any reference to their neighborhood whereas his villas were well integrated in the surrounding nature. Nothing is known about the photographers he employed but he surely had them trained by showing them his collection of travel photographs.

By 1900, photography had become an integral part of each architect's economy. The beginnings of modern architecture (Nikolaus Pevsner) were marked by the architects of the Arts-and-Crafts movement whose 'reform' houses were designed for a better living in harmony between humans and nature. Besides beautiful perspective drawings and etchings, these houses were marketed by photographs published in illustrated magazines which no longer addressed themselves to other architects but to the open public. Photographers like Henry Bedford Lemere in London, Waldemar Titzenthaler in Berlin, and Clément Maurice in Paris began with depicting luxurious interiors as samples for a bourgeois life-style just after historism and before modernism, thus practising modern tactics of public relation for design with forms belonging to the century passed. Careers of architects like Charles Francis A. Voysey, William R. Lethaby, Charles R. Ashbee, and even Charles R. Mackintosh would not have been possible without the aid of photography; by the beginning of the 20th century, these images of exemplary interiors were found in catalogues of the first retail stores.

But there were dark sides of the architecture, industrialization, and town planning in the late 19th century as well, and they were documented with equal intensity by photographers who had received their training in front of great architecture on travels or at home. Carl Ferdinand Stelzner and Hermann Biow had recorded the great fire of their home town Hamburg in 1842 on daguerreotypes but were unable to sell these images to the city. In the late 1850s, cities like Paris started

to commission photographers like Charles Marville to take photographs of all streets and places that were to be torn down by Baron Hausmann's new town plans —a matter of political legitimation. A decade later, his efforts were prolonged by Thomas Annan in Glasgow depicting the old closes and wynds of the city just prior to their demolition. Another decade later, his album was widened by a new set of images, and the company of Alfred and John Bool and Henry Dixon received a similar commission by the newly founded Society for Photographing the Relics of Old London.

All of these photographers, and dozens of their colleagues alike, felt conflicted about these buildings, on one hand it was clear that the photographed areas had to be destroyed for reasons of social welfare and hygienics, on the other hand the images represented a substantial loss of each city's morphology. The last and greatest photographer in this line is, without doubt, Èugene Atget who started his long series of Parisian 'locations of a scene' (Walter Benjamin) by 1890. His work, rediscovered by the Surrealists in the 1920s, in several ways marks the turn to modernism in both documentation and photography. His pictures belong to photography, in view and print, but belong to history in composition and perspective. Street photography as practised by Èugene Atget bore fruit to numerous others, and lesser known photographers aiming to sell their images to painters, illustrators, and the press. In Italy, Switzerland, and Germany, around 1900 one can find in any city at least one 'house photographer' who walked from street to street, from house to house, taken images of each house in order to sell it to the landlords and inhabitants.

Human beings served as an ornament of city photography which was partly unavoidable, but on the other hand partly served as picturesque additions to the moods evoked. Additionally, some of the later photographers conceived their series—commissioned or not—to show human poverty and misery as caused by bad housing conditions. Travel photographers like John Thomson made the streets of London appear more human, while painters like Georg Hendrik Breitner developed their interest in the iconography of human labour by photographing workers in the canals and places of Amsterdam. The New York police reporter Jacob August Riis, born in Denmark, employed the camera to change the situation of his fellow immigrants; his book on "How the Other Half Lives," published in 1890, led to major changes in the city's town planning. Well issued, his example was followed around the turn of the century by nearly every large city in the world; health insurance companies ordered photographers to document tenement conditions as well as their demolition. Riis and his colleagues were the first to introduce flash light into architectural photography as there was no other lighting source for their work. Just after the turn of the century, Lewis W. Hine started his career by finding symbolic forms and gestures for the imagery of social fate—as is the case with Atget and some of the Fine Art photographers, his work seems to mark crossing the frontier of historism and modernism.

Since the late 1880s, Fine Art photography arose as a movement of autonomous search for the social integration of the new technique and medium into the art world. Aesthetically, this movement was stuck to the classical subjects and motifs—including landscape which just had been added to the list after William Turner's efforts in establishing this subject within painting—and therefore architecture simply happened within certain images. Hugo Henneberg of the Vienna school had Italian palazzi included in his views on dark alleys; Peter Henry Emerson directed his camera to Norfolk and Suffolk farm houses; Constant Puyo showed small villages as integral part of his vertical and horizontal panoramas. A singular position within the whole movement is held by Frederic Henry Evans who started as a part of the British Arts-and-Crafts movement and shared the 'visionary spires' of the late 19th century Gothic revival. After a short period in close vicinity to William Morris and his Kelmscott Manor Press he found his life-time theme in English mediaeval church interiors which he photographed for their subtlety of light direction and for which he found the technical equivalent in using the platinum print.

The Fine Art photography movement, as represented by the Linked Ring brotherhood, did not regard architecture as a sufficient subject of criticism but there were a number of members within this movement who had an urban background and traced themselves within it. Alfred Stieglitz had begun with his own artistic work as a student of photo-chemistry and while travelling to the German south and Italy. His first attempts in Fine Art photography were taken in Berlin around 1890, and to a great deal they dealt with the urban growth of this city, both in the interior and in the exterior. When he returned to New York, his view on the Manhattan shore shaped his vision as well as Broadway by night—a concisely modern subject in architecture and photography. This vision was shared by several colleagues commuting between the American and the European continent, as Edouard Jean Steichen and Alvin Langdon Coburn did. Their photographs of the big city were widely acclaimed in exhibitions on the old continent and praised by critics as well.

Although they were made in 1904 and 1912, one should consider two architectural photographs as the last ones of the 19th century bearing in them all modern elements but showing themselves as typical prints of the century gone: Edouard Steichen's view on the Flatiron building on New York's broadway and Karl F. Struss'

image of the Brooklyn Bridge with its grids of wires. Both images are made at dawn and under bad weather conditions, both are gum prints in a brownish monochrome tone and not substantially sharp in detail. But both pictures show all elements of modern architectural photography: a basic composition beyond the classical forms of perspective and distance, a definition of time and space within the photograph itself by reference to weather, light and clouds. Beyond the function of advertisement for architects and building companies and besides the idea of a picturesque view on edifices unknown (and 'colossal' as the 19th century wanted it), these impressions present themselves as entities of their own. Architecture and its image had fallen into each other, modernism was on its edge.

ROLF SACHSSE

See also: Archaeology; Landscape Photography; and Itinerant Photographers.

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ARCHIVES, MUSEUMS, AND COLLECTIONS OF PHOTOGRAPHS

The analysis and evaluation of the formation of collections of photography during the 19th century remains largely unresearched though it plays a significant role in the form, function and reception of the medium during the first half century or so of its existence.

The 20th century provides a litany of the loss and destruction of 19th century photographic collections ranging from the archives of both large and small photographic companies through public institutions and commercial companies to private individuals. Key to this was a matrix of value judgments. Firstly, some photographic archives simply became redundant for the purposes they had initially been set up. Advances in photographic technology also produced a degree of 'churn' whereby new, technically better and more relevant photographs replaced older equivalents. One only has to consider the replacement of photographs of paintings during the 19th century as isochromatic emulsions were introduced, that in turn were replaced by panchromatic emulsions and then by colour images. However, in some instances such collections failed to live even into the 20th century. One specific cause was ambient environmental conditions. Heat and humidity of many climates were instrumental in the deterioration and eventual loss of numerous 19th century photographic holdings. This has to a degree masked the history of photographic archives in many countries with tropical climates.

Perversely, while Web-based digital image databases and catalogues are in some respects rendering 'analogue' photographic collections redundant, thereby increasing the threats to their existence, information and communication technology has also acted as a catalyst that has opened up and highlighted the richness and diversity of 19th century photographic collections. Such interest has led to the re-discovery of significant but little known photographic archives ranging from major institutions to individuals.

The formal collecting of photographs covered a wide range of players; from private individuals through scholarly societies and public sector institutions to commercial companies and professional organisations. The manner in which photography was institutionalized within existing archives, libraries, museums and collections reflects the scale and scope of its application during the 19th century. However, the contemporary impact of 19th century photographic collections may never be fully revealed since so many have been dispersed and their administrative records lost. How such photographic archives were used by used by contemporaries and what influence they had still largely needs to be established.

To start with, the archives of photographers themselves remain primary sources for 19th century photography. Companies such as, Franz Hanfstaengl in Munich typified established lithographic printers and publishers who adopted photography and formed a large archive covering portraiture, art reproduction and topographic and architectural views. The archive of the firm of Fratelli Alinari—founded in 1852—forms a similarly rich coverage of 19th century Italy, though the historiography of the company's art reproductions remain central to its significance. In Great Britian, the archive formed by the Francis Frith Company between 1860 and 1970 formed a unique topographical record of Britain through the photography of some 7,000 towns and villages since Frith's photographers returned to redocument the locations over this one hundred and ten year period. However, the majority of the original negatives were destroyed in the early 1970s, though some 330,000 photographic prints survive. The significance of the archives of such 19th century photographers' companies has been occasionally recognized. For in-

stance, in 1904 the National Portrait Gallery in London purchased 12 volumes of the day books of the prominent portrait photographer Camille Silvy (1835–1910). These contain some 15,000 portraits of many key members of mid Victorian society.

Commercial photographic archives were also created during the 19th century, such as the one founded in 1877 by Adolphe Giraudon (1849–1929) that aimed to provide scholars with access to fine art and cultural photographs. Giraudon was not a photographic publisher in the mould of Adolphe Braun of Dornach, and his business model was based on the setting up of the first correspondent networks, comprising of photographers who were able to supply Giraudon with photographs taken throughout Europe and beyond. By 1900, Giraudon offered some 115,000 photographic views and the company archive still exists and operates commercially.

During the 1840s, photography formed a comparatively small amateur or commercial activity though contemporary commentators were speculating that it was likely that significant photographic collections would be formed by both those wishing to exploit the medium within their profession as well as amateur collectors. While the scale and scope of this activity is slowly being exposed, its full extent may never be known. However, collections of photographs were being formed through a variety of activities for a range of purposes from the 1840s.

In order to build a market, some photographers speculatively targeted institutions related to the graphic arts. Thus the British Museum received a number of speculative samples from photographers (or their agents) during the 1840s. These seem to have been deposited with the Department of Prints and Drawings though most of these images were not catalogued into the collection and have either been misplaced or been lost. In addition, the body of work undertaken during the 1850s by Roger Fenton to document the British Museum's collections—though highly significant—did not form the foundation of a clearly defined or substantial photography collection within the institution.

The photographic collections of private individuals during the 1840s, while comparatively small scale, provided a template that was extended during the remainder of the century. During the 1840s and 1850s photography was expensive and commercial outlets were few and almost entirely based in the major metropolises. This therefore restricted the medium in terms of it audiences.

Royalty and the nobility form a significant type of collector during this period and beyond. Prince Albert (1819–1861), the Prince Consort of Queen Victoria, seems to have been the primary catalyst in the formation of the extensive Royal Collection of photographs. Indeed, royalty are underresearched since their photographic collections were built through a matrix of commissioning, commercial acquisition and donation. In France, the collection of Emperor Napoléon III (1808–1873), formed during his reign between 1852 and 1870, reflects commercial and artistic photography during the most dynamic phase of 19th century photography. Across Europe and beyond, the nobility formed photographic collections, frequently as adjuncts to their print collections. However, there has to date been comparatively little study of these collections and their provenance.

Contemporary artists began to exploit photography during the 1840s. Jean-Auguste-Dominique Ingres (1780–1867) used the daguerreotype to record his paintings as early as 1842 and photographs from his collection, including daguerreotypes, survive. During the 1840s, John Ruskin accumulated a large collection of over 100 daguerreotypes some of which he used to help create illustrations for his book publications. These have survived as has the collection of 159 daguerreotypes of architecture in Italy assembled in 1840 and 1841 by Dr Alexander John Ellis (1814–1890) while travelling around the country. In both these instances the collector bought commercially available images and took, or commissioned, their own photographs. Ruskin exploited his daguerreotypes by using them as the basis for illustrations to his publications. Ellis had also intended to publish engraving after his daguerreotypes but the project never materialised.

Private art collectors began photographically documenting their collections during the 1840s. The Antwerp publisher Joseph-Ernest Buschmann (1814–1853) published his personal experiments on daguerreotyping his own art collection in 1847. The collecting of photographic portraits also began during the 1840s and the album of Salt prints assembled by the author and historian Thomas Carlyle (1795–1881) forms a prominent example the latter part of the decade.

Leading architects such as George Gilbert Scott (1811–1878) and Eugène Emmanuel Viollet-le-Duc (1814–1879) formed their own collections of photographs and the collections of photographs within architects' offices became integral parts of professional practice. Photographic publishers targeted this market produced an increasingly wide range of 'reference' photographs. In 1851 Gilbert Scott became one of the founders of Royal Architectural Museum that soon after began to collect photographs. By 1853 the Museum was publicising its intention 'to collect photographs of objects too large to be moulded.'

From the early 1850s the South Kensington Museum formed a large collection of architectural photographs. The professional institutions involved in architecture also collected photography. The Royal Institute of British Architects began to form its own collection and published at catalogue to its collection in 1871. In

1885 the *Königlich Preußische Meßbildanstalt* (Royal Prussian Photogrammetric Institute), the first photogrammetric institution in the world, was established by Albrecht Meydenbauer (1834–1921). Between 1885 and 1909, Meydenbauer and his staff took about 11,000 survey photographs of around 1,200 Prussian monuments. A further 1,600 photographs of 100 buildings in Germany outside Prussia were also acquired and some 800 photographs were taken of buildings outside of Germany, including in Athens, Baalbek and Istanbul. Meydenbauer's photographic archive survives to this day and is now under the control of the *Brandenburgisches Landesamt für Denkmalpflege* (Office for the Preservation of Monuments of Culture of the Federal County of Brandenburg).

In parallel, civil engineers also began to use photography as a professional tool and form collections. In France the l'Ecole des ponts et chausses commissioned photography from the late 1850s and formed a record of civil engineering work. The British Institution of Civil Engineers began its collection of photographs in the mid 1860s, by which time evidence suggests that all major civil engineering projects were being photographically documented.

The use of photography by government and state departments is also noteworthy. The military extensively used photography to document fortifications, equipment, maneuvers and battlefields. The British Royal Engineers began forming collections of photographs during the 1850s and also recorded art and architecture on behalf of other public institutions. The military also formed collections for related activities such as the thousands of photographs taken to produce *The Medical and Surgical History of the War of the Rebellion* published in Washington, D.C., between 1870 and 1888.

The criminal justice system began to form archives of photographs as early as the 1840s. In 1843 daguerreotypes were being taken of prisoners in the prison in Brussels and kept by the Sûreté Publique (Criminal Investigation Department). By the 1860s many European states were employing photography to create documentary records of prisoners. Scene of crime photographs were also being widely taken from this time.

The systematic use of photography within cultural and heritage institutions began in the 1840s. The Minutoli Institut in Liegnitz in Silesia was particularly influential and formative on British attitudes. The institute had been created by Alexander Freiherr von Minutoli (1806–1887) and had opened to the public in 1845. By 1848 the photographer Louis Birkes had taken at least 25 daguerreotypes of pieces from the collection. These were mounted in a frame and sent to various members of the Institut's society (*Gewerbevereine*). Some of Birkes' Daguerreotypes were exhibited at the 1851 Great Exhibition in London. Minutoli also exhibited Daguerreotypes from his collection at the Allegemeine Deutsche Industrie-Ausstellung in Munich in 1854 and in the following year exhibited three albums at the Exposition universelle in Paris. In 1856 he exhibited Salt paper photographs of his collection at the Industrial Arts Exhibition in Brussels At the 1862 International Exhibition in London, he advertised, and perhaps even exhibited, a seven-volume, twenty-four section set containing some 4,000 'works of antiquity, photographed from the originals and intended as models for manufacture, and artisans' Priced at £120 (800 thaler).

By the early 1850s a number of major museums and galleries began to build collections of photographs, sometimes exploiting a dedicated photographer such as Charles Thurston Thompson at the South Kensington Museum and Roger Fenton at the British Museum. Other institutions such as the British Library, the Bibliotheque National in Paris and the Library of Congress represent some other pertinent examples. The South Kensington Museum began its collection of photographs around 1853. Some 139 were listed as being held in the museum by the following year, almost entirely represented by 125 photographs of Maxime du Camp's views of Egypt, Nubia, Palestine and Syria. By 1880 there were some 50,000 photographs in the collection. Each photographic image—including those illustrating books and other publications—were individually logged in museum's the Photograph Register and allocated a unique number. The register not only recorded the date of acquisition but also the provenance and cost. It thus forms a rich source of information about a number of key aspects of mid 19th century photography.

Other key aspects of the photographic collections at the South Kensington Museum were the commercial sale of copies of the photographs taken on behalf of the museum—both of its collections and temporary exhibitions—and also aspects of outreach. The South Kensington Museum formed a 'Circulation Collection' for the provincial schools of art and photographic publications, such as the *Art Workmanship* volumes published during the late 1860s and early 1870s, played a prominent role.

Universities and research institutes also began to form collections of photographs from the middle of the 19th century. In the 1850s, Harvard University received a gift from Francis Calley Gray (1790–1856) of some 4,000 photographic reproductions of European paintings. The Deutsches Archäologisches Institut founded in 1829, which became a Prussian State Institute in 1871 and an Imperial institute in 1874, also formed collections of photographs. However, during the 20th century many universities and scholarly institutions disposed of their 19th century photographic holdings.

Photographic societies themselves began to form collections, primarily through donations. The Royal

Photographic Society, founded in 1853, and the Société française de photographie, founded in the following year, are two of the most prominent examples. The collections of local, rather than national, 19th century photographic clubs and societies, though significant, have largely been lost. However, the scale and scope of the evaluation of such institutional collecting is in its infancy and the history of the photographic collections in countries formerly part of the Soviet Union awaits fuller analysis.

The role of copyright law also played a crucial role in the forming of collections of photographs. In Great Britain the 1836 Copyright Act reduced the number of libraries entitled to receive legal deposit copies of published works from eleven to five, The British Museum Library (since 1972 the British Library), the Bodleian Library of the University of Oxford, Cambridge University Library, the Faculty of Advocates in Edinburgh and Trinity College Dublin. These institutions therefore began to acquire photographically illustrated publications through deposit and purchase. In the case of the British Library these holdings are international in scope.

State intervention to document national cultural heritage began in the early 1850s. In 1851 the French Government through the Commission des Monuments historiques selects five leading photographers, Édouard Baldus, Hippolyte Bayard, Gustave Le Gray, Henri Le Secq and O. Mestrel to document the medieval architecture of France. Some 258 prints and their corresponding negatives were acquired from this Mission héliographique though their contemporary impact was very limited. In 1874 Séraphin Médéric Mieusement (1840–1905) became the official photographer of the the Commission des Monuments historiques and took more than 6,000 negatives. Mieusement's work was complimented by another Commission photographer, Jean-Eugène Durand (active between 1876 and 1917)

In 1852 French copyright law was extended to include photographs. This meant that copies of all photographs on public sale be registered and deposited with the Ministery of the Interior or a local prefectural clerk. In Paris, over 9,000 photographs were registered at the dépôt légal during 1864, a peak largely reflecting the craze for *carte de visite* celebrity portraits.

After much lobbying and great debate, the 1862 Fine Arts Copyright Act was passed in Great Britain. For the fist time copyright legislation in Great Britain included the rights of photographers as 'authors.' Photographers could register their works at Stationers Hall using standard template registration forms (the originals now held in The National Archives, Kew) onto which copies of the image could be attached. However, photographs were also used to illustrate other works ranging from graphic designs, paintings and even designs for the specific use of chicken wire enclosures on poultry farms. The information on these forms, together with the photographs pasted on them, give a broad view of the state and application of photography during the second half of the 19th century. Hitherto they have been largely unresearched.

Artists, art schools and designers were early collectors of photography and a number of photographers created photographs specifically for this market. This seems to been particularly active in France where from 1854 Adolphe Braun of Dornach produced a series of flower studies (*Fleurs photographiée*s) to enable designers to work from natural models. In Paris from the mid 1860s Charles Hippolyte Aubry (1811–1877) created photographs of still lives of flowers that were sold to art schools. Similarly From the late 1860s the Italian Gaudenzio Marconi (1841–1885) created a wide variety of nude academic studies for artists.

The Royal Academy of Arts in London systematically collected the large format photographic portfolios of the collections of major European galleries issued by the firm of Adolphe Braun & Cie from the late 1860s. Other holdings include early portraits by William Lake Price (1810–1895) dating from the 1850's, portraits by David Wilkie Wynfield (1837–1887) dating to the 1860s and *Animal Locomotion* by Eadweard Muybridge (1830–1904).

Curiously, given the innovatory application of photography in France during the 1850s, the Ecole des Beaux-Arts in Paris began collecting photographs in 1866, some 14 years after the South Kensington Museum, though it to was to form a substantial collection by the end of the century.

The collecting of photographs by local history, antiquary, and archaeological societies forms another key component. From around 1850 there was a very dramatic increase in the number of these societies. This was on an international scale. Evidence suggests that most adopted photography to help fulfill their aims and objectives. It was noted that in 1856 the Architectural Society of the Archdeaconry of Northampton linked in 'union' with the local photographic society with the intention of members of the photographic society promising to enrich the architectural societies 'sketch book' with photographs of 'local architectural subjects.'

In 1858 Alexander James Beresford Hope (1820–1887), who was instrumental in the founding of the instrumental in the founding of the Architectural Museum in London implored those attending the inaugural meeting of the Kent Archæological Society that 'Photography is the honest friend who always comes out with the whole truth' and concluded that the Society should adopt photography for 'it would be a shame and disgrace to it not to do.'

The local history and archaeological societies also give insights into the collecting habits of their members.

In England each society held an annual conference at which a 'temporary museum' would be set up. Members regularly exhibited photographs from their collections.

The historiography of collections is of key significance in the evaluation of the long-term influence of 19th century photographic collections. The pathway from private collections to institutional collections began comparatively early. On his death Chauncey Hare Townsend (1798–1868) bequeathed his collection of photographs to the South Kensington Museum and these now form some of the most important works held at the Victoria and Albert Museum. Lord Martin Conway (1856–1937) and Sir Robert Witt (1872–1952) both started their respective collections of photographs in the late 19th century. While Conway's interests were primarily in architecture and sculpture, Witt specialized in the art of the Italian Renaissance and through donation, in 1932 and 1952 respectively; their photo archives became the core of one of the largest photographic collections of art and architecture held at the Courtauld Institute of Art of the University of London.

The 19th century saw the foundation of very significant numbers of professional bodies societies together with 'scholarly' societies and related organizations. Some professionals were involved in the vast construction campaigns undertaken during the period; architecture, civil engineering, railways and shipbuilding. Conversely, the fascination of the past spawned large numbers of societies dedicated to the understanding and preservation of the past. Architectural, archaeological and local history societies proliferated. All of these groups were to form collections of photographs to achieve their aims and objectives.

The study of ethnography and anthropology developed rapidly from the middle of the 19th century. In Great Britain the Royal Anthropological Institute (founded in 1871 from the merger between Ethnological Society of London and the Anthropological Society) began its collection of photographs that remains one of the pre-eminent example.

Another ethnographic photographic collection, that of the Smithsonian Institution, encompasses a number of aspects of photographic collecting. In 1867 the English financier William Blackmore (1827–1878) loaned his personal collection of photographs of "North American Indians" to Joseph Henry (1797–1878), the Director of the Smithsonian in Washington D.C., and hired the artist and photographer Antonio Zeno Shindler to make copies of them to help prepare the catalogue for an exhibition—*Photographic Portraits of North American Indians in the Gallery of the Smithsonian Institution*—that was mounted in 1869. This was the Smithsonian's first photographic exhibit and the copies of Blackmore's collection helped form the basis of the institution's own collection of ethnographic photographs. In 1872 the Smithsonian established a relationship with Blackmore to assist his project of building a photographic archive.

From the early 1860s Blackmore had formed a collection of some 2,000 photographs of North American Indians that dated from 1850–1875. This included his commissioning photographers. Blackmore had built a museum in his hometown of Salisbury to house his extensive collection of early archaeological artefacts and intended to place his photographic archive there. In addition, Blackmore planned to publish a series of photographs from his collections. His untimely death in 1878 scuppered these projects.

The British Empire provided fertile ground for photographic campaigns aimed at building associated collections. From 1868 onwards the British Museum Library and the India Office Library (the successor to the East India Company Library) both enjoyed the privilege of legal deposit of printed books, periodicals and newspapers from undivided India. Photography was extensively used by the 'Archaeological Survey of India,' established in 1861. Many of these photographs are now held in the India Office Collections of the British Library.

In London, the Royal Geographical Society was fortunate to have John Thompson (1837–1921), as instructor of photography, and both fellows and members were encouraged to take pictures, and give the Society any photographs they had taken or collected. Certainly in the 1860's and 70's a large number of photographs were donated which form the basis of the Society's extensive collection today.

Societies related to geographical and historical study included the Palestine Exploration Fund, founded in 1865. The Fund extensively exploited photography to document biblical and post-biblical archaeological sites. It formed a relationship with the British Royal Engineers whose photographers created numerous views, some published by the Palestine Exploration Fund .

Medical photography was well-established by the 1880s and some hospitals were creating albums of clinical photographs. By this time most hospitals in France had photographic departments though in England and the USA medical photography remained in the hands of individual photographers. By the mid 1890s X-ray photography was in use in German hospitals for orthopaedic surgery. Lantern slides created for teaching formed another aspect of such medical collections. Many such collections survived well into the 20th century but were eventually displaced by the 35mm transparency format.

By the 1860s many commercial manufacturers were using photography as a core business tool and forming photographic records of their productions. By the

early 1860s photos replaced drawings in the china manufacturer Minton company pattern books. Railway companies soon began to employ photographers to capture images of their newly completed locomotives, and some companies, such as British Beyer Peacock, gave them to their salesmen to show their potential customers.

Collections of photographs evolved during the 19th century to cover all aspects of human endeavour and were to have a significant effect on progress in perhaps the most dynamic phase of the 'industrial revolution.' However, the scale, scope and impact of such collections is largely an untold story that awaits to be told.

ANTHONY HAMBER

See also: Royal Geographical Society; and South Kensington Museum.

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ARCTIC AND ANTARCTIC

As a result of being in partial or complete darkness for a significant period of the year. Polar regions present a shorter window of opportunity for the successful application of photography. Due to the expansive areas of snow and ice, there are challenges in lighting during periods of full or partial daylight which give rise to poor contrast and loss of detail due to overexposure.

The first objective interpretation of the, often romantically depicted, harsh and unusual polar landscape was undertaken by staff of scientific and exploring expeditions as an aside to primary duties. It would be more than twenty years after the introduction of photography, in the early 1840s, that a dedicated photographer would be appointed to an expedition to ensure that a new and fickle medium would become a reliable means of recording the opposite ends of the world.

Constraints in storage space made smaller glass plates a logical choice but potentially compromising quality of reproductions while shortage of water restricted processing and printing usually waited till return to civilisation.

Details of the technical challenges of photography, such as "keeping excited collodion plates sensitive" and "a remedy for cracking in negatives," are well recorded at the time in journals such as the British Journal of Photography. Similar discussion on the unique challenges relating to capturing images in the Polar Regions was limited and often left to others observing the process. Veteran Arctic explorer Dr. Isaac Hayes on board William Bradford's 1869 cruise to western Greenland recounted one such event observing that the "insects got into the instrument and ruined the plates."

Away from the ship photography was severely limited on account of low light and harsh, sub-zero conditions, as low as –30˚F, and technical difficulties posed by the wet plate process. Sledging journeys were gruelling and only essential equipment was carried and photographic equipment would account for about 5% of the load. Preservation of images was a significant challenge and they were often lost prior to return to civilisation.

Daguerreotype apparatus was uncommon but it was taken on the 1853–54 United States Franklin Search expedition, led by Elisha Kent Kane. Reportedly the apparatus was used but all images were lost on an ice floe.

Some of the earliest surviving images were from the collotype process, used by Surgeon of HMS *Resolute* William Thomas Domville while on Sir Edward Belcher's Franklin search expedition of 1852–54. Commander E. A. Inglefield used Glass plates while participating in a Franklin search expedition in 1852–53. Both groups of images are held by the National Maritime Museum, Greenwich. Until the advent of the dry plate process and its commercial patient in 1881 the wet plate process was most commonly used on polar expeditions.

George Simpson McTavish in the 1860s and Edward W. Nelson in 1877 were just two of the land-based expeditions who also used photography in the Arctic.

The *Challenger* expedition of 1872–1876 utilised photography and images from this expedition are the earliest known of Antarctic icebergs and sub-Antarctic islands. George Strong Nares was commander of *Challenger* and would later command of the British Arctic Expedition of 1875–1876. This expedition equipped and trained, through the Royal Engineers, Thomas Mitchell and George White in photographic processes. Their efforts gave rise to the 108 images produced as a boxed set and were also used as illustrations in accounts of the expedition.

In the 1880s scientific enquiry became increasingly coordinated on an international level giving rise to increased opportunities for photography. One example of this was the first International Polar Year in 1882–1883, which involved twelve countries with activities in both Polar Regions. Science and exploration were not alone in attempts to utilise photography to document human endeavour in a harsh, remote, unexplored region of the globe.

Pleasure voyages to the Arctic financed by independently wealthy individuals also provided a platform for

Bourne, Samuel. The Manirung Pass.
The Metropolitan Museum of Art, Gilman Collection, Purchase. Cynthia Hazen Polsky Gift, 2005 [2005, 100.499 (99)] Image © The Metropolitan Museum of Art.

photography. Some undertook scientific observations, for example Benjamin Leigh Smith's voyages to Svalblad and Zemlya Frantsa-Iosifa in 1873 and 1880. William J A Grant participated on at least seven private or scientific voyages as photographer, including one of *Pandora* in 1876 and *Willem Barents* in 1881 and 1883.

William Bradford (1827–1892) privately financed six expeditions to the low Arctic between 1861–1869. He employed Boston-based photographers, John L Dunmore and George Critcherson from the studio of James Wallace Black to record images that would provide "accurate and instantaneous images which could later be used to create paintings." The results were highly successful as the photographers had a dedicated darkroom onboard, that Bradford had installed for their sole use. Aspects of these voyages are recorded in the impressive volume *The Arctic Regions*.

The more stable and transportable dry plate process increased flexibility for photographing Polar Regions as commercial and scientific expeditions increasingly focused on the Antarctic after 1880. By this time photography had proven itself as an ideal means of recording and broadcasting images that suited both scientific, sponsorship and commercial aspirations of expeditions.

Commander Adrien de Gerlache de Gomery and his compatriots in *Belgica* (1897–1899) were the first to over winter in the Antarctic and produced the first photographic images of the continent. Carsten Borchgrevinik and his privately financed British Antarctic Expedition (1898–1900) were the first scientific expedition to over winter on the Antarctic Continent and used photography.

Despite the abundance of opportunity, the medium had limited success when compared to other extreme environments, such as images of Kashmir, India from 1864 and 1866 by Samuel Bourne. Importantly, photography provided a means to convey to a wider audience

a sense of visual truth from a region previously often represented by exaggerated and fanciful images. With significant investment in skills and equipment reliable results and useful images could be achieved but results and how the images were utilised varied widely.

By the end of the nineteenth century photography was well placed to serve what became known as the *Heroic Age* of Antarctic exploration and the advances in science and technology that would follow in the first two decades of the twentieth century.

RICHARD FERGUSON

See also: Expedition and Survey Photography; History 4: 1850s; and Royal Society, London.

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ARGENTINA

The daguerreotype

To understand the spread of photography in the whole country it is necessary to keep in mind that Buenos Aires was the main city and the only harbor devoted to international commerce. Moreover, the nation was involved in several internal conflicts.

Daguerreotypes were referred to for the first time in a Buenos Aires newspaper, the *Gaceta Mercantil*, on March 11th, 1840. It merely reproduced an article published in France. The demonstrations that took place at Montevideo (Uruguay) in March 1840, conducted by the Abbot Comte, were not commented in Buenos Aires due to political reasons. Three years elapsed before the arrival of the daguerreotype to Buenos Aires, this delay being caused by the French naval blockade to Buenos Aires harbor.

On June 1843 advertisements began to be published in the *Gaceta Mercantil*, *The British Packett,* and the *Diario de la tarde*, in which a North American, John Elliot, announced his studio at 56, Recova Nueva street. At the same time, the Litografía Argentina, at 28 Potosí Street, owned by a Spanish citizen, Gregorio Ibarra, informed the customers about the arrival from Paris of two cameras. In Buenos Aires the daguerreotype did not the same popular interest as in Paris or New York. It was still a small town and preserved many of its old colonial habits.

Another North American, John Amstrong Bennet, opened the second gallery of Buenos Aires in 1845, at 121 Piedad Street. He arrived from Mobile, Alabama, and worked as a daguerreotypist in Montevideo (Uruguay) during 1842 and 1843; by the end of 1845,he had left Buenos Aires for Bogotá (Colombia). In 1846, Thomas Columbus Helsby, who owned the Galería Montevideana in Uruguay, with his brother William, made frequent trips to Buenos Aires and worked as itinerant portraitist. In 1853 he settled with his brother in Chile, where they established renowned galleries, in Santiago as well as in Valparaiso.

Charles DeForest Fredricks (1823–1894), the most important photographer among those active in Argentina in the mid-nineteenth century, came to Rio de la Plata after travelling with his camera through Venezuela, Brazil and Uruguay. Although the first itinerant daguerreotypists worked in Buenos Aires, an Italian citizen, Aristide Stephani (1820–1865), opened the first provincial gallery as early as in 1846, in the city of Corrientes, where Anselmo Fleurquin and Joaquín Olarán became active soon afterwards. In 1855, a German, Adolfo Alexander (1822–1881), crossed the Andes coming from Chile to Argentina and worked in San Juan and Mendoza. A year later Amadeo Jacques—the future director of the most renowned high school in Buenos Aires—earned his living as a daguerreotypist in Santa Fe and Tucuman. At nearly the same time, Desiderio Aguiar—born in the Province of San Juan—an Englishman, Fergusson, and a North American, Bradley, made succesful careers taking photographs of the principal cattle-owners' families at the pampas.

Between 1855 and 1858, the names of Federico Artigue (1826–1871), Antonio Aldanondo (1831–1891), Bartolomé Bossi (1817–1890), Walter Bradley, Pedro Gartland, Emilio Lahore (1825–1889), Francis Meeks, Arthur Terry and Antonio Pozzo (1830–1910) were among those devoted to the new craft. The only woman daguerreotypist we know about was formerly a painter, Antonia Annat de Brunet.

In 1852, Juan Camaña (1795–1877) brought to Buenos Aires the stereoscopic daguerreotype. Stereoscopic daguerreotypes were not very popular because of their high cost.

As only a few daguerreotypists signed their work, most of them remain anonymous. Between the few artists that signed their works are Amadeo Gras (1805–1871), Saturnino Masoni (1826–1892), Juan Portal and Anselmo Fleurquin.

Daguerreotype Views

Nowadays, the only extant nine daguerreotype views are those preserved at the Museo Histórico Nacional (Buenos Aires), five of them signed by Charles De Forrest Fredricks and the rest attributed to Antonio Pozzo.

Ambrotype, Tintype, and *Carte-de-Visite*

These one-image procedures were common, in particular the ferrotype or tintype, but the albumen paper became popular in the *carte-de-visite* format and soon afterwards it was used in all the photographic size styles, including views for albums, that began to be produced in the midst of the 1860s. Some salt paper prints reached Argentina but they are very scarce.

Albums of Views

In the sixties, the first albums of views appeared. Some of the pioneers were Esteban Gonnet (1830–1868), Benito Panunzi (1819–1894) [Many albumen prints of outdoors scenery or popular types were wrongly attributed to Panunzi. A recent study clarifies the mistake and shows that Gonnet was the author of many of them. (Alexander & Priamo, 2000)], Adolfo Alexander, Georg Alfeld (in Rosario), and Ángel Paganelli (in Tucumán). In the following decades other authors were Antonio Pozzo, Christiano Junior, Desiderio Aguiar, Saturnino Masoni, Carlos Feltscher, Samuel Boote, Francisco Rimathé and Walter Bradley.

Portraitists

An English citizen, Alejandro Samuel Witcomb (1835–1905), was probably the most renowned portraitist of the 19th century [His archive—that included part of Christiano Jr. and Loudet' archives—is kept in the Archivo General de la Nación, Buenos Aires]. He arrived very young from England, and settled in Rosario; several years later he established in Buenos Aires, were he became a famous artist. Other outstanding masters were Antonio Aldanondo, Luigi Bartoli, Emile Mangel du Mesnil, F. Meeks, W. Bate & Co., Emilio Lahore (1825–1889), Bartolomé Loudet (1823–1887), Juan Ansaldi, Carlos Chute, Alfonso Fermepin, Arturo Mathile, Arquímedes Imazio, Francisco Monzón, Roberto Offer, and Juan Portal.

Photo Illustrated Books

William Fox Talbot rapidly realized that the photograph had a wide terrain to expand itself: the printing press products and as early as 1839 introduced an album with mounted photographs. In Argentina, as in other countries in the region, the photo illustrated book can be traced to the 1860s. Initially, the usual image was the author´s portrait but soon in the 1870s it was common to illustrate a book or a brochure with different kinds of images: city views, anthropological portraits and any kind of objects.

Photomechanical Processes

In early times different varieties of photomechanical systems were employed, mostly illustrating books, brochures and magazines. The first practitioners included Christiano Junior and Emilio Halitzky, who used mostly the phototype. In 1885 the Museo de La Plata brought from Europe modern photomechanical printing equipment, the best for the time being, for phototypes. As far as we know, woodburytypes were never made in Argentina.

Scientific and Technical Uses of Photography

During the 1860s the first medical uses of photography appeared. In the early 1870s Schultz-Sellack succeded in taking astronomical photographs, and the growing community of scientists left anthropological, paleontological and natural science testimonies by means of photography.

Engineering activities such as dam building, bridge construction, industrial facilities, railroad construction and mining activities were recorded.

The phototeodolite was briefly used, according to universitary registers.

Photomicrography was first tried by Roberto Wernicke, who made early experiments between 1884 and 1887.

Early experiments with X rays were conducted at the Faculty of Sciences of Buenos Aires, two months after the publication of Roentgen's paper.

The Argentine Society of Amateur Photographers

As in many other countries, a select group of the high society showed interest in photography and founded this Society in 1889. This Society was instrumental during several decades in publishing albums, as well as in organizing contests and printing a Bulletin.

ROBERTO A. FERRARI

See also: Daguerreotype; Tintype; and Cartes-de-Visite.

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ARNOLD, CHARLES DUDLEY (1844–1927)

Charles Dudley Arnold was born in Port Stanley, Ontario, Canada, moving to America at the age of twenty and working as a salesman. It is not clear when he took up photography, but by 1886 he was listed as a photographer in New York. His obituary mentions that he travelled with his camera in Europe—probably in the early 1880s—and architectural photographs by him survive of locations in England and France. Many of these photographs were published in 1896 in the book *Country Architecture in France and England XV. And XVI*. Centuries, and yet more, as late as 1924 in *French Farm Houses, Small Chateaux and Country Churches in France* by Antonio Di Nardo.

Arnold's first book of photographs, *Studies in Architecture at Home and Abroad*, was published in New York in 1888. Three years later, his reputation growing, he moved to Chicago to document the construction of the exhibition site for the 1893 Columbian Exhibition at Jackson Park.

He later went on to take photographs of the Cotton States Exhibition in Atlanta in 1895, and became official photographer for the 1901 Pan American Exposition which was held in his adopted home town of Buffalo — where he erected a large studio on the exhibition site.

He continued in business until the early 1920s, and died in 1927.

JOHN HANNAVY

ARNOUX, HIPPOLYTE (active 1869–c. 1890)

Hippoltye Arnoux was one of a group of photographers who entered the market catering for the growing number of visitors to the Nile Valley from the mid 1860s.

His place and date of birth are unknown, but he is known to have been French, based in Port Said, and his national origin may have played some part in his decision to produce an extensive photographic coverage of the Suez Canal.

His studio was located in the Place des Consuls, and later in Place Ferdinand de Lesseps in Port Said, and his premises, and the sailing boat which served both as a floating darkroom and to transport his equipment, advertised his specialism, being emblazoned with the legend 'Photographie du Canal.'

The earliest of his photographs—which are all undated except one—was taken shortly after the canal's opening in 1869, and he continued to expand his catalogue until c.1890. The one dated photograph comes from 1885.

In addition to images taken on the canal, studies of Egyptian types, probably taken in his Port Said studio, date from the later 1870s onwards.

It has been suggested that the Greek born Geogiladakis, perhaps a former assistant, may have continued to market Arnoux's images after c.1895, as several known Arnoux images bear an overprinted 'Georgiladakis' signature.

JOHN HANNAVY

ART PHOTOGRAPHY

In 1867, a decade before his election to the papacy as Leo XIII (1878-1903), Cardinal Gioacchino Pecci composed a Latin poem entitled "Ars Photographica." The poem proclaims that photography surpasses even the achievement of the ancient Greek painter Apelles, portraitist of Alexander the Great:

Drawn by the sun's bright pencil,
How well, O glistening stencil,
You express the brow's fine grace,
Eyes' sparkle, and beauty of face.
O marvellous might of mind,
New prodigy! A design
Beyond the contrival
Of Apelles, Nature's rival.
(Translated by Robert M. Adams)

Some years after becoming Pope, Leo XIII commissioned a fresco celebrating the new art of photography. Situated in the vault of the Galleria dei Candelabri, the mural depicts personifications of Painting, Sculpture and Architecture paying homage to Ecclesia; Photography is depicted in a lower realm, accompanied by Weaving. Despite being sanctioned by the pope, photography continued to occupy an ambiguous position in the hierarchy of art, science and craft during the second half of the nineteenth century.

In 1860, in a paper read to the South London Photographic Society, the Victorian portrait photographer Cornelius Jabez Hughes proposed to divide photography into three classes: "Mechanical [or literal] photography, Art-photography, and, for want of a better term, High-Art photography." In the first category, he suggested, the photographer aims at "a simple representation of the objects to which the camera is pointed … where all the parts are to be equally sharp and perfect." Art Photography, by contrast, "embrace[s] all pictures where the artist, not content with taking things as they may naturally occur, determines to diffuse his mind into them by arranging, modifying, or otherwise disposing them, so that they may appear in a more appropriate or beautiful manner than they would have been without such interference." For Jabez Hughes High-Art Photography was a discrete category of Art Photography limited to "pictures which aim at higher purposes than the majority of art-photographs, and whose aim is not merely to amuse, but to instruct, to purify, and ennoble."

Some years earlier, in a paper presented at the Royal Society of Arts in 1852, Roger Fenton had already acknowledged the difficulties facing the photographer when he or she attempted to represent the ideal by photographing the particular. Fenton recommended, as a partial solution, that practitioners should always select the best and most appropriate models. This recommendation echoes classical notions of ideal beauty, exemplified most famously by Zeuxis when he undertook to execute a painting of Helen of Troy for the citizens of Croton. It will be remembered that Zeuxis selected as his models the five most beautiful virgins in Croton and combined in his painting the best features of each woman. Zeuxis's emphasis upon selection prefigured Fenton's recommendation that photographers should choose the best models, but his practice of combining the best features of his models was incompatible with the literal nature of photography. Fenton's still-lifes and game-pieces confirm that he chose his models carefully. In addition, they link the practice of photography to venerable pictorial traditions, most particularly those of seventeenth- and eighteenth-century Italian, Netherlandish and Spanish painting. Fenton's still-lifes also link photography to ancient mimetic traditions, exemplified most famously by two paintings executed by Zeuxis and Parrhasios. Zeuxis's *trompe l'oeil* of grapes appeared so real that birds came to peck at it, but Parrhasios's painting of a curtain deceived Zeuxis himself. Similar to Fenton's artistic still-lifes and hunting pictures are photographs made contemporaneously in France by Charles Aubry, Adolphe Bilordeaux and Adolphe Braun.

William Henry Fox Talbot in the first years of photography created pictures that prefigured Fenton's and Jabez Hughes's definitions of art photography. In particular, Talbot's *Fruit Piece*, in *The Pencil of Nature*, anticipated Fenton's still-lifes by more than a decade. Talbot selected, arranged and composed his subjects, while also exploring various effects of light and shade. In some notable instances he produced alternative versions of the same composition, and in other cases he returned again and again to the same subject. Between 1843 and 1848, in Edinburgh, David Octavius Hill and Robert Adamson also produced architectural views, conversation pieces, portraits and *tableaux vivants* that transcended literal recording. Hill approached the practice of photography with a painter's training and eye and worked with composition, pose, light and shade to create pictures that were, in some respects, equivalents in the new medium to portraits by Henry Raeburn, for instance, or to etchings by Rembrandt. Hill and Adamson, like Talbot, were evidently more concerned with mood and effect than with the literal recording of their subjects. A photograph such as that entitled *The Fairy Tree at Colinton* demonstrates that Hill and Adamson could be as much concerned with magic and imagination as with the transcription of nature.

In 1868 in a review published in the *Art Journal* the anonymous author observed on seeing an album of photographs by the so-called father of Art Photography, Oscar Gustave Rejlander, "If, a few years ago, we had been asked the question, 'Has Photography produced anything worthy of being called a work of Art?' we

Aubry, Charles Hippolyte. Study of Leaves on a Background for Floral Lace.
The Metropolitan Museum of Art, Gilman Paper Company Collection, Purchase. Howard Gilman Foundation Gift, 2004 (2004, 106). Image © The Metropolitan Museum of Art.

should have hesitated to give an answer in the affirmative." In the meantime, however, some photographers had shown that "more can be done than we at one time thought possible, and that results are obtainable from lens and camera, which are not merely imitations and copies from nature, but productions of mind and thoughtful study." "Of Mr. Rejlander's pictures (for such we may justly call them)," the reviewer concluded, "we have no hesitation in saying that they are full of beauty and full of mind." It is evident from this that photography, if it was to achieve the status of art, was expected to combine beauty, intellect and study; conversely, photography that merely transcribed the ordinary world could not aspire to be art.

Rejlander linked art and photography in various ways. This is evident from writings such as "An Apology for Art-Photography," a paper he read in February 1863 at a meeting of the South London Photographic Society, and from his photographs. Rejlander produced a large number of art studies based on figures in paintings by Raphael, Titian and others in the belief that they would prove useful to artists. In addition, he created photographs in the manner of Renaissance and Baroque painting and antique sculpture. In keeping with Fenton's and Hughes's ideas, Rejlander selected the most appropriate models for his subject pictures and arranged his sitters to create compositions that were not necessarily present in nature. On one famous occasion, reported by Rejlander himself, the photographer magically transformed a model drawn from the streets into an entirely plausible decapitated head of John the Baptist. It might reasonably be argued that Rejlander adapted the classical practice of selection and synthesis to photography, creating pictures that combined nature with beauty and intelligence. To achieve this goal Rejlander developed a practice that sometimes required the production of several negatives, which he would then combine harmoniously to create pictures that had no prior existence in nature or in the studio. Rejlander's most notable combination print is his great allegorical picture *The Two Ways of Life*, the most complex and controversial of his photographs. The didactic, moralising and uplifting nature of *The Two Ways of Life* situates it and other similar photographs by Rejlander firmly in Jabez Hughes's third category, that of High-Art Photography.

Julia Margaret Cameron**,** who may have received instruction in photographic technique from Rejlander when he visited the Isle of Wight in 1863 to photograph Alfred Lord Tennyson, consciously subverted the literal characteristics of photography in order to create pictures that sometimes concealed as much as they revealed. Like her predecessors in the 1840s, Cameron also created pictures that reflected her positive familiarity with earlier traditions in painting and sculpture, from the Elgin Marbles to Renaissance masters such as Pietro Perugino, Raphael and others. Among Cameron's contemporaries, Clementina, Vicountess Hawarden, and Charles Lutwidge Dodgson also produced photographs in which composition, light and visual intelligence outweighed the mechanical transcription of quotidian reality. Cameron, Carroll and Lady Hawarden, like Talbot and Hill, also created pictures that were themselves fictions, *tableaux vivants* inspired by works of art or literature, ranging from the Bible to the novels of Sir Walter Scott and the poetry of Alfred Lord Tennyson.

Among Rejlander's professional contemporaries, the painter–photographers William Lake Price and Henry Peach Robinson also employed the combination printing process to create *tableaux vivants* in the manner of Victorian paintings and to invent pictures that were often literary and elevating in nature. In fact, Robinson affirmed in *Picture Making by Photography* (1886) that his goal was "to induce photographers to think for themselves as artists and to learn to express their artistic thoughts *in the grammar of art* [my italics]." Robinson's *The Lady of Shalott* and *Bringing Home the May* are linked closely to the contemporaneous tradition of Pre-Raphaelite painting, echoing pictures by John Everett Millais. Although it was heavily criticised when

it first appeared, Robinson's composite photograph, *Fading Away*, is acknowledged now to be one of the most poignant visual evocations of death in Victorian society. Peach Robinson's *Pictorial Effect in Photography* (1869), in which he first articulated his theory of a photographic art, continued to be influential into the twentieth century.

At the end of the nineteenth century and the beginning of the twentieth, art photography developed in various forms in Europe and in North America. Peter Henry Emerson in his treatise *Naturalistic Photography for Students of the Art* (1889) articulated a vision of photography as an independent art, only to repudiate this position a year later in *The Death of Naturalistic Photography* (1890). Pictorialism evolved contemporaneously in Europe and in North America as an international movement. Pictorialists aimed to produce photographs that were painterly in nature, mirroring the ambiguous, amorphous qualitities of etchings and paintings by James Abbott McNeill Whistler, for instance. Their practice of lavishing great attention on individual prints was also in keeping with the cultivated rarity of the contemporaneous tradition in fine prints, illustrated particularly by the etchings and drypoints of Whistler, David Young Cameron and others. In England the ideals of Pictorialism were promoted by the Linked Ring Brotherhood, which included photographers such as James Craig Annan, Fred Holland Day, Frederick Evans and many others. In 1902, in New York, Alfred Stieglitz established the Photo-Secession, an association intended to promote photography as a fine art, and the following year he inaugurated *Camera Work*, which he produced and edited from 1903 to 1917. Stieglitz published the work of many of the American and European Pictorialists in *Camera Work*.

GRAHAM SMITH

See Also: Hughes, Cornelius Jabez; Fenton, Roger; Aubry, Charles Hippolyte Bilordeaux, Adolphe; Braun, Adolphe; Talbot, William Henry Fox; Hill, David Octavius, and Robert Adamson; Rejlander, Oscar Gustav; Cameron, Julia Margaret; Hawarden, Viscountess Clementina Elphinstone; Dodgson, Charles Lutwidge (Carroll, Lewis); Price, William Lake; Robinson, Henry Peach; Emerson, Peter Henry; Pictorialism; Brotherhood of the Linked Ring; Annan, James Craig; Day; Fred Holland, Evans, Frederick H.; and Stieglitz, Alfred.

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ART PHOTOGRAPHY AND AESTHETICS

Photography's productions are descriptive and relatively literal; their integrity as works of art depends on transformative processes that are material, experiential, and analytical. Aesthetic theory considers how works of art are perceived or experienced and how the artistic is understood and translated into visual characteristics. Accordingly, photographic art requires consequential aesthetics founded on formal attributes: composition, focus and distinctness, and relations of light and shadow; material characteristics, such as image colour and surface finish; and choice of subject matter. These elements might be couched in the terms of other visual arts, or simply borrowed, as George Davison observed in 1891: "Photography has come late in the day. It would be difficult for it to avoid likeness to something that had preceded it" (Davison 1891, 721). This was more than a defence of photography's nascent status as an art form; it was also a way of understanding photographs as pictures. Indeed, photography, like painting and drawing, is a transposition of mechanical and material realities to a two-dimensional picture plane, so an analogy with graphic art is appropriate.

The mere recording of surface facts is not sufficient to the wider consequence of art, and in photography, a more formal consideration of pictorial modes was derived from academic art, which endorsed invented, synthetic picture-making, founded on classical, Renaissance, and Enlightenment notions of ideal beauty. Art theory was codified in the late eighteenth and early nineteenth centuries by Sir Joshua Reynolds at London's Royal Academy and Antoine Quatremère de Quincy at the Institute des Beaux-Arts in Paris. Both distinguished between the raw content of art—a direct observation of nature—and the intellectual and picto-

rial exposition necessary to raise the picture beyond its utilitarian, descriptive function and into the realm of intellect and invention. Reynolds's theory of a "liberal art" appealed to the practitioners of a medium whose access to the status of fine art was thwarted by its association with popular, applied art and commerce, and his *Discourses*, like later works by John Burnet and Sir Charles Eastlake, would be central to early texts on photographic art, such as those by William Lake Price and Henry Peach Robinson.

In *Pictorial Effect in Photography* (1869), Robinson counselled photographers to look to established fine arts for aesthetic principles and compositional modes. This was consistent with the notion of art as a synthetic activity, inspired by but only tangentially concerned with nature. But photographic imaging was more consistent with materialism, predicated on the observation of readily defined and distinguished facts. In 1857, Elizabeth, Lady Eastlake noted a prevalent belief in photographic circles that "art had hitherto been but a blundering groper after that truth which the cleanest and precisest photography [...] was now destined to reveal" (Eastlake 1857, 461). In pictorial terms, this type of truth might be understood as 'imitation,' or superficial resemblance to the original referent. Yet pictures might also incorporate 'natural' truth, concurrent with physiological sensation, and 'artistic' truth, pertinent to the conventions of representation. All of this produced conflicting expectations of photographic art, illustrated by the reception of combination printing. The method synthesized a single image from multiple negatives in the service of a technical purpose: lenses did not have the covering power to resolve a large group of figures, nor could a practicable exposure time be achieved for a format that might exceed seventy centimetres. Combination-printed tableaux, notably by Oscar Gustav Rejlander and Henry Peach Robinson, were elaborate fabrications inspired by popular history painting. Yet what was unexceptional in painterly invention was contentious in a photograph. Combination prints deceived the viewer's expectation of photographic truth; particularly, the presumption that a photograph would necessarily depict a single material referent as it appeared at the moment of exposure.

Straight, unmanipulated photographs also produce "untruths" such as apparent distortions in tonal relations, perspective, and scale. Manipulation was a necessary corrective of those ostensible inaccuracies, however truthful in optical terms. It could also make the photograph more than an image "taken" directly from nature without mediation or interpretation. A photograph could be "made"; expected to function as a picture, with its own visual qualities and expressive modes. For Robinson, nature needed to be disciplined and dignified, and transformed into a "picture" through the use of selection and composition (as well as several negatives). His photographs showed a disposition of elements—figures, foreground interest, peripheral framing, and background closure—that marked such work as 'pictorial' rather than a spontaneous or serendipitous transcription. Robinson's subject matter of genre scenes and literary themes owed much to Pre-Raphaelitism, but that school was a problematic model for photographic art, as its concern with detail and disdain for pictorial convention was popularly thought to be inspired by an uninflected, 'mechanical,' photographic vision.

The nineteenth century saw a shift in art from the academic studio and its conventions, towards the inspirations of the natural world. There was an increased interest in individual experience, influenced by changing social and economic structures and reflected in the Romantic movement in literature. A Romantic resistance to urbanization and industrialization fed the interest in *plein-air* painting, whose attentions to a naturalistic diversity of light was detailed in effects of weather, foliage, and geological form, as discussed by Pierre-Henri de Valenciennes and John Constable and more widely couched in the theoretical vocabulary of the picturesque and the sublime. Photographers cited the same pictorial modes and locations: in France, Gustave Le Gray and Eugène Cuvelier shadowed Barbizon painters such as Théodore Rousseau at Fontainebleau, while in Britain's Lake District, Roger Fenton and George Washington Wilson traced the literary paths of Samuel Taylor Coleridge and William Wordsworth. Press reviews made an explicit correlation between Fenton and Wilson's exhibition photographs and John Ruskin's recasting of naturalism into cogent formalism, detailing atmospheric perspective and powerful luminosity as productive of a transcendent sense of infinity.

Academic art was largely based on the traditions of the past, and in this respect, American artists and photographers were at a disadvantage in developing an indigenous art within a national history scarcely a century old. Naturalism was a tremendous opportunity. In 1836, the painter Thomas Cole argued that American artists should attend to the "wildness" of unspoiled nature, and in the same year, Ralph Waldo Emerson proclaimed 'natural' truth as a liberating, spiritual force. Transcendentalist theory connected sight and insight; closely attentive seeing produced a more profound spiritual perception, and, with respect to John Ruskin's idea of the "innocence of the eye," contravened academic convention. Such theories supported luminist painting and Cole's Hudson River School, echoes of which appear in photographs by William H. Rau**,** Carleton Watkins, and Eadweard Muybridge. William J. Stillman presented a synthesis of Ruskin's naturalism and Emerson's transcendentalism in photographs and editorials for his weekly art journal, *The Crayon*.

The connections between naturalistic art and optical devices such as the camera obscura has been widely discussed in modern times, but in the nineteenth century the pictorial relationships were not seen as deterministic. Optical instruments were not the dominant basis for works of visual art; they were designed to replicate established visual conventions, and were valued more as teaching aids and auxiliary help for specific problems of perspective. Their productions only latterly validated artistic training; the lens's field of view coincided with the established awareness of a delineated frame, and its focal planes recreated, but did not inspire, the artist's emphasis or selection of certain planes of the picture. Optical aids predated the photographic camera, though not by much; problems with focus and lens aberrations meant that they were actually practicable for less than a century before photography's invention. Still, photographic cameras incorporated earlier designs and corresponding representational systems, even as the latter shifted from a unified, Cartesian space to one more fragmentary, subjective, and modern.

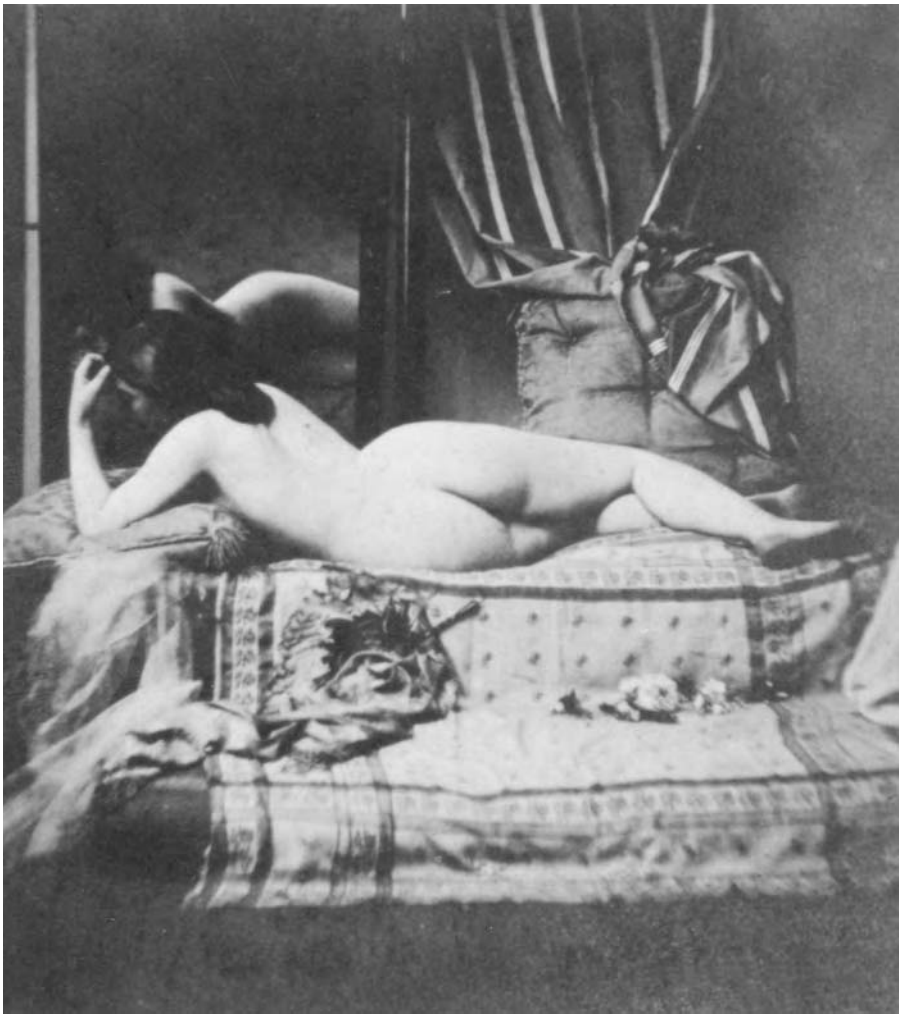
Relationships between vision and art were of great interest in the nineteenth century, and French 'realist' and British 'naturalistic' painters aimed to represent direct visual sensation as a means of rethinking representation beyond imposed ways of seeing and the pictorial devices of academic painting. One might imagine that photography had no such conventions and that the camera simply recorded material reality. But there was a similar argument to be pursued; does a photograph convincingly represent what we *think* we see in the natural world? While it might be assumed that a transcription of the visible world required the most precise resolution, it was recognised that the human eye had a very partial view of nature, circumscribed by distance, atmosphere, luminance, and field of view. If these limitations were true to the essential nature of human vision, then perhaps distinctness was not the most appropriate or truthful optical mode. Indeed, critics such as Charles Baudela**ire** ('The Salon of 1859') and Charles Blanc (*The Grammar of Painting and Engraving* 1867) criticized photography for its detailed and inexpressive literalness, reflecting concerns, in art, with the validity of verisimilitude and its rejection by those interested in more subjective or expressive schema.

An aesthetic justification for indistinctness emphasized its role in subduing disparities in tonal relations, equating this with the production of "breadth," a term in fine art generally taken to mean the suppression of complex detail in favour of broad, harmonious tonalities. In 1853, Sir William Newton argued that the effect of breadth in photography was determined by tonal rendition and image resolution or focus. He believed these attributes to be best represented by the calotype process, used by photographers such as Henri Le Secq and Benjamin Brecknell Turner (see under landscape) well into the 1850s. Glass plate negatives produced a higher resolution and better tonal separation, but these attributes undermined breadth. In 1860, Thomas Sutton made the same association with the glossy finish of albumen paper: "the real charm of a fine subject consists in a sort of mysterious impression of depth and space; and a varnished surface injures this effect by rendering the subject represented more intelligible in its details, flat, little, and vulgar" (Sutton 1860, 13). Sutton equated sharp detail with literalness and banality, and these failings were often identified as characteristic of photographic images.

Diffusion might counter these faults. In 1864, John Traill Taylor recalled that Talbot had recommended the interposition of translucent paper between the negative and positive to reduce sharpness, especially in portraits. (Taylor 1864, 27). Vignetting was used to a similar end; a graduated fading at the image periphery was originally produced by curvature of field and inadequate coverage in single lenses, but the effect had an antecedent in painted portrait miniatures and from the 1850s was purposely replicated in photographs, usually through the interposition of a mask.

Soft focus could be introduced by opening up the lens aperture, as recommended by Noël Marie Lerebours (see under Lemercier, Lerebours and Bareswill), or by moving the lens relative to the negative plane during exposure, proposed by Antoine Claudet and Joseph Bancroft Reade. The camera could be vibrated during the exposure, while the "vibrotype" used a spirit lamp, lit in front of the camera to create a current of denser air that veiled the object. From the 1860s, diffusion was produced through the reintroduction of lens aberrations such as astigmatism and spherical aberration. A number of lenses were designed to that end, most notably John Dallmeyer's 'Patent Portrait' lens (1865) and the Dallmeyer-Bergheim lens (1897).

Without a serious rationale, diffusion might simply be the abuse of a good lens or technical incompetence. But soft focus was believed to have a physiological basis, in being more true to human sight. In 1889, Peter Henry Emerson adopted theories on vision and representation from Hermann von Helmholtz and British "naturalistic" painters such as Francis Bate and Thomas Goodall. Emerson argued that the optical characteristics most in keeping with natural vision were represented by a simplified, centralized composition incorporating selective focus (see naturalistic photography). In the 1850s, similar debates concerned 'natural' binocular vision versus the unnaturally flattened picture space produced by the monocular eye of the lens. The issue shadowed the evolution of lens technologies; the original single, meniscus lenses had a relatively shallow focal plane, but newer combination lenses gave a more



D'Olivier, Louis Camile. Nude Study.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

consistent focus across the depth of field. Such equivalence across picture planes made the photographed subject appear more two-dimensional. To some, this looked inartistic and untrue to natural human vision, an argument partly inspired by contemporaneous critiques of Pre-Raphaelite painting as having forsaken volumetric devices such as atmospheric perspective, resulting in flattened pictorial planes. But the issue was an older one; one-point perspective presupposed static, monocular vision, and seventeenth century French discussions on geometrical optics noted its inadequacy in representing a mobile eye. In the early 1890s, these arguments were updated with the advent of properly instantaneous photographs, when the multi-second exposure times and expressive diffusion of Julia Margaret Cameron's portraits were discussed in terms of a more truthful duration of time representing the real experience of seeing a human face, rather than a frozen, static image produced in a split-second, faster than—and thus inaccessible to—normal human perception.

There were many ways of defining truth in vision; as physiological sensation, as a combination of sensation and mental synthesis, as observation enhanced by experience, not to mention the multiplicities of artistic truth. Critics of naturalistic painting and photography assumed that visual sensation—unaffected by the eye's mobility, by habit, convention, and experience—precluded the mind's participation. Without consciousness, sight was a simple reflex, shared by those of widely differing intellectual and imaginative capabilities. If photography was proposed as an imaginative art, then it too depended on mediated perception. In 1860, the art critic P. G. Hamerton explained the difference between artistic and photographic sight in just these terms: "What we artists see is a vision of Nature through the lenses that *she* has given us, our own human eyes brightened or dimmed […] with human joys and sorrows [... we do] not see her at second hand by the intervention of a glass lens and a mahogany camera" (Hamerton 1860, 128). The vagaries of individual perception did not bolster the notion of some ultimate truth to nature. Instead, they suggested that representation could be diverse because the seeing that it communicated was also varied, partial, and even idiosyncratic. Such ideas

would be pertinent to impressionism; the relationship between psychology and aesthetic experience, and an awareness of the power of individual temperament to affect the reception of sensation were argued by James Sully and Émile Zola, among others.

The emphasis on art as dependent on individual, subjective inspirations extended Romanticism and heralded the symbolist movement in literature and art. Symbolism was oriented towards mysticism and metaphysics; it correlated sensory and spiritual resonances between different art forms, and embraced allegorical subjects and simplified, organic motifs. In the 1890s, photographers such as Alfred Horsley Hinton and the critic Sadakichi Hartmann discussed these ideas in relation to photography. Symbolism recast traditional subjects in the Swedenborgian elements of Frederick H. Evans's architectural views, the close intimacy of seeing in Carine Cadby's still-lifes (Brotherhood of the Linked Ring) and Eva Watson-Schütze's portraits (Philadelphia Photographic Salon and Linked Ring). Many of these works used diffusion and grain to isolate the object from its material context, paring down detail to describe the essence rather than the facts of a subject; rather than mirroring exterior reality, the photographs suggested an interior world. Compositional devices included asymmetrical framing and flattening of pictorial planes, elements in modern painting that were seen as inspired by Japanese art (Richard Muther 1896), while in art photography, they were identified with contemporary art and snapshot photography (Gleeson White 1893). The snapshot camera used a short-focus lens whose wide depth of field compensated for the lack of focusing adjustments, but tended to flatten the picture planes. Equally, the box camera's absence of a viewfinder made framing a matter of guesswork, which could result in unconventional framing. The effect was appreciated as evocative of the lively jumble of modern life, already found in stereoscopic views of the 1860s and seen also in impressionist painting.

The Arts and Crafts movement held that a valid aesthetic experience could be realized through the making of a work of art. Photographers were receptive to such possibilities; photographic materials were already discussed in terms of taste and sensibility, and formal, aesthetic, and even moral values were ascribed to characteristics such as colour and surface finish. For example, the neutral image colour and matt finish of developed-out silver calotype positives and platinum prints were compared with engravings and drawings, and seen as more elegant than albumen prints, whose more brilliant finish and brown hues were by now ubiquitous. Tonal rendition was also compared: the platinum process produced a longer tonal range as compared with silver printing, and gave a superior rendition of detail in shadow areas. This was in keeping with the increasing interest in the faithful replication of natural luminance through the broadest range of tonal values, which developed out of the tenets of naturalism in painting and was taken up by photographers in the 1880s.

The monochrome subtlety of platinum prints was set against hand-tinted photographs. Restraint in the treatment of colour was an established issue in academic painting, and carried some urgency at a time when bright, aniline dyes were widely used, and glaringly visible, in mass-produced commercial goods. The same prejudices applied to the characteristics of surface finish; glossiness was associated with vulgar commercialism, and the sheen of albumen prints compared with varnished academic paintings, both described as showy and common. In fine art, there was a movement towards flatness in treatment and finish, a tendency in impressionist painting equated with a refusal of the artifice and conventions of the Salon. Likewise, at a time when the most typical, commercially acceptable photograph was glossy, a matt surface would look unconventional and uncommercial, and hence, artistic. Many wished for photographs with a rough surface like that of drawing or watercolour paper, but contact papers like platinotype and silver printing-out paper needed a relatively smooth finish to provide a good contact with the negative and a reasonable resolution in the resulting print. Not until the 1890s were more highly textured surfaces made for the new enlarging papers.

A rough surface also communicated a certain tactile animation. This was particularly advantageous with regard to photography, for in contrast to the marked surfaces of hand-made artefacts—paintings, drawings, intaglio prints—the photograph had a very consistent, uninflected surface, especially from the later 1880s, when manufactured printing papers were more uniform.

Photography also coopted, from etching, an idea of artistic intent in print-making, especially in terms of the printer's control over differences between successive proofs of the image. In 1889, Peter Henry Emerson described photogravure as "the final end and method of expression in monochrome photography," and imagined a time when "every artist who expresses himself by photography will also bite his own plates and make his own blocks, and the prints will be published by print-dealers as etchings are now" (Emerson 1889, 207, 212). From 1888, Emerson's portfolios and books were illustrated with photogravures, which appeared first in the *Photographic Journal* (1886-88). By the 1890s, the process accounted for almost one-third of printed illustrations, and even half-tone plates imitated the tipped-in presentation of gravures, complete with a tissue cover paper.

A similar impulse towards the crafted object contributed to a revival of hand-made photographic papers,

including salted paper (Lyonel Clark. Linked Ring), gum prints (Robert Demachy) and brush-developed platinum prints (Joseph T. Keiley). In the late 1880s and 1890s, home-made recipes were used for both new and old processes: the photographic press printed formulas for gelatin silver papers some years before manufacturers had perfected them, while calotypes and salted silver papers were championed in opposition to mass-produced materials. In photography, as in the decorative arts, there was a reaction against mechanization and industrialization, and a concurrent interest in a pre-industrial, artisanal tradition. Pinhole apertures and single lenses appealed to a similar nostalgia; in the 1890s, periodicals carried fond reminiscences of photographing with a spectacle lens set into a coffee canister or a tea tin.

Yet there was also a belief that the material qualities of a photograph were overemphasized. In 1891, Alfred Maskell argued for intentionality: "We are told that the photographer uses an unintelligent machine. Well—the brush and the palette, are they intelligent? Of course, in both cases, the intelligence is, or should be, in the user" (Maskell 1891, 142). This defended photography against accusations that it was the automatic product of a machine, a criticism that cut more deeply with the advent of snapshot photography. Small, hand-held 'detective' cameras and new, ready-sensitized dry plate negatives required little training or premeditation and photographs were popularly seen as both instantaneous and unmediated. While some technical skill was credited to the photographer, there was no recognition of the more subtle effects of picture-making: composition, management of light and shade, tonal control, and diffusion were all assumed to be inherent to the photograph, captured by a happy combination of luck and timing.

Maskell's argument also derived from a notion of art as founded on idea—intelligence or thought—over medium and materials, and he paraphrased the painter James McNeill Whistler's proposition that the finished work of art should not be dominated by the material properties of its production, because these distracted the beholder and undermined a full engagement with the work. This perspective also contributed to the debate about manipulated photographs and truthfulness. While 'hand-work' was key to the complicated pictorialist techniques that refuted photography's reproducibility, it was also associated with the extensive retouching practised by commercial portrait photographers, and condemned on principle by many, including Peter Henry Emerson and Alfred Stieglitz.

Some believed that, in order to establish photography's claim to art, it was necessary to withdraw from the practices that served the medium's commercial viability and professional base. In the 1890s, this encouraged a rejection of the old exhibition classifications that grouped pictures according to technical characteristics, irrespective of their pictorial intent. The pricing of photographs was less concerned with process than presentation, size, and uniqueness: at the 1898 Crystal Palace Exhibition of the Royal Photographic Society, silver, platinum, carbon, and gum prints by photographers such as Frederick Hollyer, Charles Job, and Charles Constant Puyo were valued within the same range. There was considerable attention to presentation: the traditional light-coloured mounts and gilt frames of mid-century were replaced by materials largely inspired by the Arts and Crafts emphasis on simplicity and unobtrusiveness. Frame shapes were simple and, like window mounts, often quite deep, setting the photograph off from its surroundings. This was a useful device, for until the early twentieth century, exhibition walls were crowded. Muted tones had a more 'harmonious' appearance in the exhibition hall, a prerequisite for taste and sensibility. Frames were made of stained wood or lightly gilded to a matt finish, and incised ornamentation was recommended for a greater unity of decorative effect between picture and frame. In keeping with Art Nouveau and the *Jugendstil* of the Vienna Sezession, the motivation was towards the *gesamtkunstwerk*—the total work of art, integrating tangible effects with immaterial concerns.

By the turn-of-the-century, pictorialism emphasized craft and the unique consequence of additive effort in producing a photographic work of art, individual over conventional modes of expression, and expressive rather than mimetic representation. This last aspect looked ahead to abstraction, for it presupposed substantial imaginative powers in the photographer and the viewer. It also addressed the fundamental relationship between photography and pictures; if the medium simply reproduces reality, then photographic images are distinguished only in terms of differences in the subject reproduced and the technical competence of the reproduction. Pictures, on the other hand, develop out of representational systems that transcend the common experience of reality through a material vocabulary and a perceptual interaction between the photographer, the object photographed, and the audience for the resulting photograph as a work of art.

HOPE KINGSLEY

See Also: Davison, George; Eastlake, Sir Charles Lock; Price, William Lake; Robinson, Henry Peach; Rigby, Lady Elizabeth Eastlake; Multiple Printing, Combination Printing, and Multiple Exposure; Rejlander, Oscar Gustav; Genre; Le Gray, Gustave; Cuvelier, Eugène and Adalbert C.; Fenton, Roger; Wilson, George Washington; Rau, William H.; Watkins, Carleton Eugene; Stillman, William James; Baudelaire, Charles; Calotype and Talbotype; Le Secq, Henri; Landscape; Sutton, Thomas; Taylor, John Traill; Lemercier, Lerebours and Bareswill;

Claudet, Antoine-François-Jean; Reade, Joseph Bancroft; Dallmeyer, John Henry & Thomas Ross; Emerson, Peter Henry; Helmholtz, Hermann Ludwig Ferdinand von; Cameron, Julia Margaret; Zola, Emile; Allegorical Photography; Hinton, Alfred Horsley; Hartmann, (Carl) Sadakichi (Sydney Allan); Evans, Frederick H.; Brotherhood of the Linked Ring; Platinum Print; Albumen Print; Photogravure; Salted Paper Print; Gum Print; Demachy, (Léon) Robert; Dry Plate Negatives: Gelatine; Snapshot Photography; Stieglitz, Alfred; Royal Photographic Society; Hollyer, Frederick; Charles Constant Puyo, Émile Joachim Constant; and Pictorialism.

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ART UNION

The *Art Union* was a monthly periodical that began publication on 15 February 1839, priced at 8d. It was the first journal to be specifically devoted to the fine arts, and held a pre-eminent position for most of the century. Only 750 copies of the first issue were printed, but for most of the 1840s circulation was around 7,000 an issue. In 1849, the periodical changed its name to the *Art Journal*.

The advent of the *Art Union* was keyed into an increasing public interest in both Old Masters and contemporary British art. Its success also reflects the enormous growth in the market for prints that were sought after by an expanding and affluent middle class. Indeed, the origins of the journal stem from a meeting between Samuel Carter Hall, its editor between 1839 and 1880, and the well known London printseller, Thomas Hodgson. The preface to the first volume declared that journal's aim was to "communicate to Artists, from every available source, intelligence in which they are interested, and, at the same time, contain such professional information as might be supplied by persons of matured experience." Notable contributors included William Rosseti, John Ruskin, George Bernard Shaw and Sir Charles Eastlake.

An important characteristic of the *Art Union* was its interest in decorative, ornamental and industrial art. As such, during the 1840s and 1850s, the *Art Union* regularly reported on the progress of photography and enthusiastically reviewed of the annual exhibition of the Photographic Society of London. Its accounts do not contain the same scientific details as the *Athenaeum* or *Notes and Queries*, but they do express the changing aesthetic status of the medium.

The most significant photographic event involving the *Art Union* took place in June 1846, when every issue included a specimen calotype by Henry Fox Talbot. The accompanying editorial declared that "This will be a great boon to our readers, many of whom, although they have heard much of the wonderful process, have

not yet been enabled to examine an actual specimen." Engravings of daguerreotypes had previously been reproduced in periodicals like the *Illustrated London News*, but the reproduction of 7,000 photographs was a major and original achievement.

The principal writer on photography for the *Art Journal* during the 1850s was Robert Hunt, author of *A Manual of Photography* and founding member of the Photographic club, sometimes referred to as the Calotype Club. Hunt's contributions included long articles on the fading of photographs and the useful application of photography to the fine arts. One of the first descriptions of the making a collodion positive was published in the *Art Journal* in July 1851 in a communication from Fallon Horne to Robert Hunt. Other writers on photography included Ronald Campbell and Francis Frith.

In the late 1850s, the aesthetic agenda of the *Art Journal* became increasingly at odds with the commercial status of photography. Subsequently, although the *Art Journal* used photography to reproduce illustrations from the late 1880s, it rarely extended its coverage beyond a review of the annual photographic exhibition. The *Art Journal* finally ceased publication in February 1912.

JOHN PLUNKETT

See Also: Ruskin, John; Shaw, George; Eastlake, Sir Charles Lock; *Athenaeum; Notes and Queries;* Calotype and Talbotype; Talbot, William Henry Fox; Frith, Francis; and Hunt, Robert.

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ARTARIA, FERDINANDO (1781-1843)
Italian photographer

Among the first commercially available photographic views of Italy were aquatints done from daguerreotypes commissioned by the Milanese publisher Ferdinando Artaria. These plates, which were executed by Louis Cherbuin and Johann Jakob Falkeisen, were issued between 1840 and 1847 under the title *Vues d'Italie d'après le daguerreotype*. The first fifteen plates, which were registered in 1840 and 1841, are views of Milan. Of the 32 plates published in 1842, four depict Pisa and twelve are views of Florence, including two panoramas, scenes showing the Arno and its bridges and views of the principal piazzas and churches. Later plates, issued between 1843 and 1847, range from Como, Genoa, Venice, Padua and Verona, in the north of Italy, to Rome and Naples, in the south. Artaria's *Vues d'Italie* was contemporaneous with and similar in conception to Noël-Marie-Paymal Lerebours's *Excursions daguerriennes,* published in Paris between 1841 and 1843, and to Alexander John Ellis's unrealized *Italy Daguerreotyped.*

GRAHAM SMITH

ARTIFICIAL LIGHTING

During photography's early days artificial lighting was of limited use in the studio as emulsions speeds were slow: daylight was the only practical means of lighting a studio. There were experiments with flash photography as early as 14 June1851 when William Fox Talbot photographed a moving paper, claimed to be *The Times,* using an electric spark, at the Royal Institution. He took out a British patent (number 13661 of 1851) for this method. However, studio flash photography was not a truly viable and widespread until the first commercial flashbulb was made from 1929 and electronic flash became more fully developed in the later 1930s.

Artificial lighting using a high-powered illuminant was made use of as early as 1839 when Captain Levett Ibbetson used limelight to shorten exposure times when making daguerreotypes of microscopic objects. Similar light sources would be seen in the photographic studio later in the century. It was magnesium that was mainly used for lighting photographic subjects, usually away from the photographic studio, during the nineteenth century.

Magnesium was first discovered by Humphrey Davy in 1808 and William Crookes, the editor of the *Photographic News* attempted to make pictures using it in 1859, but it was not until the early 1860s that magnesium was able to be prepared in large quantities in a ribbon form. Alfred Brothers of Manchester produced the first portraits using magnesium lighting in February 1864 and in 1865 Charles Piazzi Smyth took photographs inside the Great Pyramid. Brothers took the first cave photographs, including stereoscopic pairs, in January 1865 in the Blue John Caverns in Derbyshire. With magnesium giving a powerful and controlled light, photographic

manufacturers began making special lamps from 1864 that would dispense magnesium ribbon using a clockwork mechanism. This style of burner remained popular throughout the century and simple hand-held manual versions were used for amateur photography into the 1920s.

It took more sensitive photographic emulsions from the 1880s and a significant reduction in the cost of magnesium ribbon around 1886/87 to further encourage the development of magnesium illuminants. Magnesium flash powders were introduced in the late 1880s. The powder was mixed with an oxidising agent to promote combustion and this allowed the development of holders that required no naked flame, although some devices made use of magnesium powder which was blown into a flame and ignited. Other methods included ignition using a percussion cap, a struck match head, electric fuse or spark from a flint. Portable and hand-held devices were produced, although there were significant risks associated with the handling of such an explosive mixture. In 1890 Robert Slingsby a photographer from Lincoln patented a device to synchronise a flash lamp with a camera shutter. By the 1890s patents were being issued for battery operated flash devices that could be synchronised to a camera shutter.

Magnesium was never widely adopted for professional portraiture in a studio. It was unreliable, it generated significant amounts of smoke and ash and it was potentially hazardous especially when used large quantities. The development of the magnesium wire flashbulb from 1925 which was successfully made commercially available from 1929 brought magnesium into the studio with the popular Vacublitz and Sashalite bulbs sold from 1929 and 1930 respectively.

In December 1841 Antoine Claudet patented (no. 9193 of 128 December) various methods of illuminating the studio including burning coal in oxygen in conjunction with a concave mirror to direct the light and in 1852 Pierre Bernardet de Lucenay described (patent no. 575 of 30 October) using a battery or 'pyrotechnic combustions' to provide a light for the photographic studio using a reflector and blue glass. Other methods of lighting were also trialled by photographers keen to extend the time available to make studio pictures. Gas illumination which was widely available from the 1840s was one source, although the light was of limited use for photography and generated heat. The development of the gas mantle in 1885 eased these problems. Limelight which was measured as eighty-three times brighter than oil lamps was another, but it required constant attention to keep the calcium carbonate trimmed.

The most popular of the early studio illuminants was the blue-flamed Bengal light. This was patented in France for portrait photography in 1854 and John Moule promoted its use for photography through his 1857 British patent (number 478 of 18 February). It was adopted by portrait studios as it was strong in 'actinic light' which collodion plates were most sensitive too. During the winter of 1860 an estimated 30,000 portraits were made in London. However, Bengal light was harsh and it produced noxious fumes.

The topic of artificial lighting for studios was regularly covered in the *Photographic News* in the 1870s and 1880s. In February 1879 one writer described using phosphorus and saltpetre which gave an 'exceedingly bright' light but was 'exceedingly hazardous.' The Brock firework company supplied that writer with other mixtures which, when combined with reflectors and a shade, were suitable for studio work, albeit with excessive smoke.

Electricity offered more potential to illuminate the studio in a safe, convenient and controllable way. Gaspard Félix Tournachon in Paris began experimenting with electric lighting in his studio from 1858 with limited success. He later used battery operated arc lighting to photograph below Paris in 1861 and 1862 where, despite great technical problems, he produced seventy-three images from the catacombs and twenty-three in the sewers.

Compared to other methods electric arc-lamps offered great potential for studio lighting and the introduction of the dynamo assisted this. The first studio to be illuminated by electric light was claimed to be Henry van der Weyde's Regent Street studio in 1877 although there is evidence that he was using electric lighting before this at special demonstrations and he took out a British patent for electric studio lighting in 1876. Van der Weyde's lighting in 1877 was powered by a gas dynamo and it reduced exposure times for carte-de-visite to two to three seconds. Other photographers quickly adopted electric lighting which was proudly noted in their advertisements.

By the end of the nineteenth century electric lighting was a firm part of the photographic studio and the use of the magnesium flash part of the outdoor photographer's skills.

MICHAEL PRITCHARD

See Also: Cartes-de-Visite; and Photographic News (1858–1908).

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ARTISTS' STUDIES

In a paper read in London in 1863, Oscar Rejlander touched on his practice of photographing models in the poses of figures in paintings by Raphael, Titian, Rubens and others." "I believe photography will make painters better artists and more careful draughtsmen," he affirmed. Five years later, a contributor to the *Art Journal* commented: "We hear that Mr Rejlander's avowed object and intention is to produce what may prove useful as studies to younger artists." "There may sometimes … be instances (e.g. the folds of drapery) where such assistance … might prove of great help," he continued, "but we are far from recommending any who would hereafter produce works that shall live, to lean for assistance in any way upon photographic studies, or upon aught else than originals." Julia Margaret Cameron**'s** contemporaneous photographs "after the manner of" Francia, Perugino and Raphael evoke paintings by those artists, rather being literal studies. On the other hand, Cameron's images of Mary and the infant Jesus and of Beatrice Cenci have the character of artists' studies, for the heavy garments worn by the models recall sculptural drapery studies made by artists of the Renaissance. Cameron's photographs of models posed like two of the British Museum Parthenon sculptures fall directly into the category of artists' studies; indeed, one of the photographs is entitled *Teachings from the Elgin Marbles*. Clementina Hawarden**'s** "studies from life" of her daughters likewise appear to be as much concerned with pose and dress as with portraiture or narrative. The foregoing observations point to the existence of two overlapping categories of artists' studies: photographs intended to replicate painted models or to emulate an artist's style; and photographs made to be used by artists in their training and practice. It is also important to distinguish between photographs made expressly for artists' use and photographs that were appropriated and used in ways that the photographer had not anticipated.

The practice of making studies to assist artists is almost as old as photography itself. The partnership between David Octavius Hill and Robert Adamson was initiated with a view to producing portrait studies of the Free Church ministers for Hill to use when he came to execute his historical painting *The Signing of the Deed of Demission*. Hill also used photographs to assist him with the execution of other paintings. For *Edinburgh from the Castle*, he relied on a calotype for the architecture in the central area of the view; in addition, the foreground of the picture is filled with numerous figures—Gordon Highlanders, Newhaven fishwives etc.—based on well known photographs by the partners. The painter David Roberts also used Hill and Adamson's photographs of Newhaven fisherwomen for his contemporaneous panorama of Edinburgh from the Castle. Other photographs by Hill and Adamson, such as one showing Lady Ruthven from behind, are drapery or costume studies as much as portraits. The partners also produced at least one nude study of a model holding a studio pose. In "The Calotype," an article published in July 1843, Hugh Miller wrote specifically about the potential usefulness of the Hill and Adamson calotypes for the visual arts, discussing particularly a portrait of Thomas Chalmers and a view of George Street, Edinburgh, with the church of St Andrew and St George, where the Disruption of the Church of Scotland began in May 1843.

Nadar, Gustave Dore.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

John Ruskin recognised the usefulness of photographs for the study of architecture. On a visit to Tuscany in 1846 he supplemented his own drawings by purchasing daguerreotypes, which he called "glorious things." "It is very nearly the same thing as carrying off the palace itself," he wrote to his father, "every chip of stone & stain is there—and, of course, there is no mistake about proportions." On his return to England Ruskin executed a watercolour from a daguerreotype of Santa Maria della Spina in Pisa in order to compensate for the difficulty of viewing the mirror-like plate.

Drawing from the nude model was central to the practice of artists trained in the academic tradition in Europe and North America during the nineteenth century. It is, therefore, not surprising that photographers worked from the nude and produced nude studies for the use of artists. In France Eugène Durieu produced

such studies in the 1850s in collaboration with the painter Eugène Delacroix. During the Second Empire, professional photographers made large numbers of *académies* (academic studies of nude models) specifically, if not exclusively, for artists. In England, Rejlander likewise made academic studies to be used by artists. Photographic composition studies for subjects such as the Crucifixion (Gaudenzio Marconi) and the Lamentation (Louis Bonnard) were also made, but those were much less common than individual *academies*. There are even instances in which photographs were squared for enlargement (Jean Nicholas Truchelut). Related to the *academies* were photographs reproducing ancient and modern statuary from the *Apollo Belvedere* and the *Belvedere Torso* to Michelangelo's *Moses* and Canova's *Hercules and Lichas*. These were published by photographic establishments such as the Alinari in Florence, Anderson in Rome, Naya in Venice and Braun in Paris. Such photographs were acquired largely by travellers, but they were also valuable reference works for artists. Such photographs did not supplant plaster casts, but they did provide alternatives to them.

Beginning with Gustave Courbet and Theodore Rousseau in the 1850s, French painters employed photographs as aids in their search for new forms of realism. Édouard Manet appropriated photographs as studies for contemporary history paintings such as the *Execution of the Emperor Maximilian*. Edgar Degas and Pierre Bonnard were themselves photographers and used their pictures in their work as painters. Thomas Eakins in Philadelphia made hundreds of photographs of his pupils and drew on these studies for major paintings such as *The Swimming Hole*. In Berlin in the 1890s Edvard Munch was influenced by the photographs of August Strindberg. At the turn of the century in Paris, Pablo Picasso made extensive use of ethnographic photographs for paintings leading up to and including the *Demoiselles d'Avignon*.

GRAHAM SMITH

See Also: Rejlander, Oscar Gustav; Cameron, Julia Margaret; Hawarden, Viscountess Clementina Elphinstone; Hill, David Octavius, and Robert Adamson; Ruskin, John; Durieu, Jean-Louis-Marie-Eugène; Delacroix, Ferdinand Victor Eugène; Marconi, Gaudenzio; Alinari, Fratelli; Anderson, James; Naya, Carlo; Braun, Adolphe; Courbet, Gustave; Degas, Edgar; Bonnard, Pierre; and Eakins, Thomas.

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Sylvia Woolf, with contributions by Stephanie Lipscomb, Debra N. Mancoff and Phyllis Rose, *Julia Margaret Cameron's Women*, New Haven and London, 1998.

ASSER, EDUARD ISAAC (1809–1894)

Dutch photographer and advocate

Eduard Isaac Asser was one of the first representatives of early photography in the Netherlands. An advocate by profession and bred in one of the most prominent Amsterdam Jewish families of jurists and lawyers he experimented with photography at a very early stage. Eduard Isaac Asser and his sister Netje Asser were already known to the Dutch public because of their enchanting childhood memories of life in Amsterdam just after the Napoleonic period, written between 1814 and 1833, and published in 1964. In 1994 the Asser Family Foundation bequeathed the photographic legacy of Eduard Isaac to the State of the Netherlands. The photographs are now held in the Print Room of the Rijksmuseum in Amsterdam. These incunabula consist of four albums compiled by the photographer himself with c. 200 examples of early calotype photography (c. 1845), actually the earliest known photographs of Amsterdam, and from the beginning of the 1850s on until 1857 wet collodion photography. There is a group of 20 daguerreotypes from the 1840s, as well as proof prints of photolithography which he made in the late 1850s. Asser was active as an amateur artist as well. He received lessons from the Amsterdam painter Jan Adam Kruseman (1804–1862) and regularly sent his paintings to the so called Exhibitions of the Works of Living Artists. As all young men from well-to-do circles Eduard Isaac owned a large collection of scientific instruments.

It is presumed Asser bought his equipment and plates around 1842 in Paris, where the Fould family lived, they were related to his wife who descended from the Cologne banking family Oppenheim. From that moment on Asser learned to make the laborious daguerreotypes, mainly portraits of the members of his family. The first examples of paper photography date from 1845: small paper negatives with views from his house on the canal het Singel, which we can date fairly exactly. He also used this same process for portraits done around 1846–1847. Particularly of interest is a set of self-portraits starting on the title page of the first album, written in French, from which we can draw the conclusion that he somehow started this album as a photographic autobiographical notebook. The self-portrait on the title page is followed by others stating his various moods—'a morbid state' explains one of the adjoining written remarks. During his short career as an amateur photographer Asser kept making self-portraits of which especially the ones done

against a dark ground are intriguing. Asser is seen in a crumpled jacket with the black stains of the chemicals on his fingers sitting on the kitchen chair contemplating, the next moment probably running on to one of his many meetings in the as many distinguished councils he formed part of.

Self-portraits, portraits (groups and double portraits), still lifes and views of the city of Amsterdam were to be the main subjects of his oeuvre which is very similar to that of the British and French amateur photographers from the early period. They all made portraits of their wives and children or compositions with glasses, vases and small statuettes close to hand. Asser photographed from the window of his house, the obvious experiment with a new medium. A special category are his still lifes of photographic paraphernalia: a lens, a camera, a statuette, a stereoscope, a portfolio of photographic paper and a copy of the *Revue Photographique*. With the self-portraits they show his contemplating over the form and content of images done in a new medium of which the canon wasn't at all established yet.

Asser worked together with Marie Eugène Bour (1814–after 1884) a Frenchman and the managing director of the garancine factory in Amsterdam, a chemical factory which produced the red paint for the uniforms of the French army. It is very probable that at the beginning of the 1850s they experimented with glass negatives and new emulsions. In 1855 they submitted their photographs to the International Exhibition of Photography in Amsterdam where the Dutch public surely got a treat. There the Asser and Bour photographs were for the first and last time seen in public, and hung next to the works done by many distinguished photographers, among them Edouard Baldus, Charles Marville and Charles Nègre.

From 1857 on Asser experimented with photolithography and submitted his results of transferring photographs to the lithographic stone to the contest written out by the Duc de Luynes in France. He didn't come very far and the prize was eventually won by Alphonse Poitevin. Later Asser sold the patent for his process to the Bruxelles firm Simonau & Toovey who used it for various publications. In the Netherlands this process was now and then applied for a small group of users. For instance collectors of old prints obtained facsimile photolithographs of scarce material. Throughout his life Asser kept working with his own invention, supporting print firms in Amsterdam and printing from the stone himself.

During his long life that lasted nearly the whole of the 19th century Asser not only was a curious spectator at the discovery of photography. He lived through many a decisive development in the history of photography and photomechanical printing throughout the second half of the 19th century. But and that is even more interesting he also knew the world of arts and visual culture of the pre-photographic period. When in 1830 he visited his grandparents in Berlin he brought with him as a gift drawn portraits of the members of his family and he bought lots of lithographs of the interesting sites in the Prussian capital. Twenty years later it surely would have been his own photographic prints and instead of lithographs photographs of streets, monuments and places! In Berlin he also visited the sculptor Christian Rauch and bought a collection of plaster casts which he first draught and later used in photography as well. He followed lectures by Friedrich Hegel, and in Weimar caught a glimpse of the writer and philosopher Goethe whose likenesses he knew from the prints at home. Thus he gives us many clues as to how form and function of the new medium of photography was firmly rooted in the art practices of the pre-photographic world. In his albums we see photography naturally—and gradually—develop from it.

MATTIE BOOM

Biography

Eduard Isaac Asser was born on 19 October1809 in Amsterdam. He studied law in Leiden and became an advocate in the law firm of his father in Amsterdam. In 1850 he became the first Jewish member of the Provincial Assembly of the States of North Holland and held a number of public functions. He was an amateur artist and took up photography in the early1840s. He became a member of the Société Française de Photographie in 1854. Asser was active as a photographer between 1842 and 1857, when he put away his cameras for good. From that moment on until the end of his life in 1894 he found a new pastime in photolithography. In 1860 he sold his photolithography process to the Simonau & Toovey printing firm in Brussels. In the Netherlands this process of photomechanical printing was occasionnally applied to map making in the army and for book illustration. In 1892 he was the founder of a printing house Maatschappij voor Photolitho- and Zincographie. On 21 september1894 he died in Amsterdam at the age of eighty five. His photographic legacy stayed in the Asser family for a hundred years. In 1994 it was bequeathed to the State of the Netherlands and added to the National Photo Collection in the Print Room of the Rijksmuseum.

See Also: Daguerreotype; Wet Collodion Negative; Self-Portraiture; Baldus, Édouard; Marville, Charles; Nègre, Charles; and Poitevin, Alphonse Louis.

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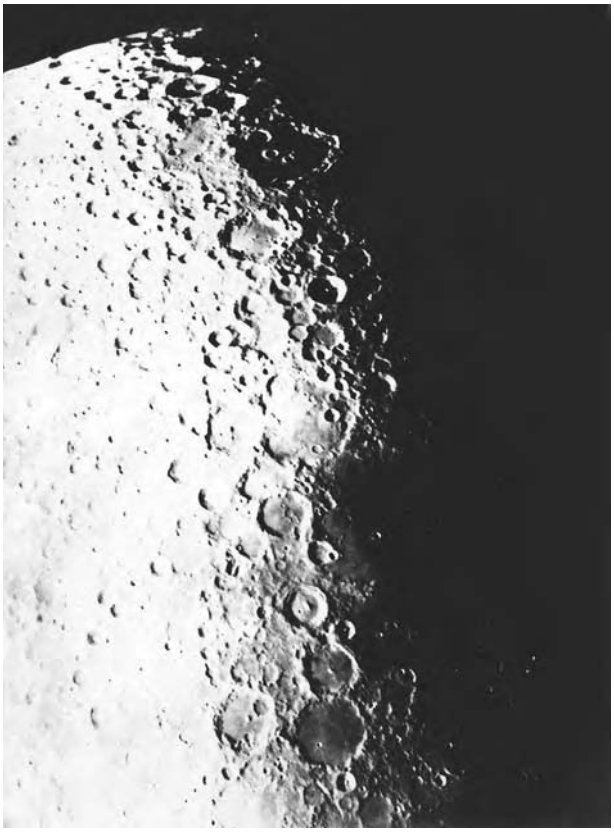
ASTRONOMY

The development of astronomy in the 19th century was in part due to the progress of science, specifically concerning optics, physics, and chemistry which consequently, became a part of photography as well. In terms of its invention, the new techniques accompanied deep rooted, scientifically based disciplines of calculation with the advent of astrophysics.

On January 7, 1839, Jean-Baptist Biot, demonstrated a "retina artificial" boundary in front of the Academy of Science with the daguerreotype. Arago, in the report on the daguerreotype made before the House of Commons on July 3, 1839 insisted, particularly, on the possible applications of photography in the field of science and the other services the technique could provide. Arago suggested in the two principal branches of astronomy and photometry, or the measured intensity of light and the observation of it, that it was now a possibility to create photographic charts of the Moon allowing thus to create "in a few seconds (...) one of the longest, most meticulous and delicate work in astronomy." On this date, Daguerre too collected "the print of the weak light of the Moon" on a plate, however the image appeared "fuzzy and low in details." Continuing Daguerre's work, the American astronomer John William Todrape, realized on March 23, 1840, in his observatory in New York, that several daguerreotypes of the Moon (which are lost today) 2,5 cm in diameter, with an installation ranging from 20 to 30 minutes, showed "the principal mountains of the star." Noting this difficult process, it was necessary to take precautions in the exposure of the plates, as the low sensitivity of the daguerreotype, combined with the very weak luminosity of the photographed object still constituted major obstacles.

It is important to note that astronomers and physicists were primarily the first to be interested in new photographic techniques. The latter were concerned with questions pertaining to the analysis of light and the settings of optics. Often these astronomers were also opticians and manufacturers of glass who expressed a natural interest in the connection between light and optical lenses. In fact, the word photography was "invented" during the first months of 1839 by two astronomers. The first was a Berliner, Johann Heinrich Mädler, who in 1830 created a drawn chart of the Moon, and later employed the recently forged term, which appeared in the columns of Vossische Zeitung on February 25, 1839. The other, John Herschel, was an inventor of his own process of paper developed photography, and during February and March in 1839, he used the term photography on several occasions in his notebooks which documented his experiments during these months. That same year he conducted experiments in which he took photographs in the light of the moon, in Talbot's company. Scientists, attracted by the prospect of reliable, objective documents and photographers were collectively interested by the new possibilities of the medium. The beginning of 1840 saw the flourishing of several experiments with daguerreotype as the base. The great majority of these plates like the eclipse of 1842, was photographed in Milan by Majocchi (2mn), and in Venice by Malacarne. At the observatory in Paris, under Arago, several research experiments were conducted around the photography of the Sun, as it is an object of strong luminosity, which seemed to be more accessible at the time and were conducted in collaboration with, Lerebours, Hippolyte Fizeau, Leon Foucault and Gustave le Gray between 1842 and 1847. Of this collaboration, the only daguerreotype to survive was taken by Fizeau and Foucault on April 2, 1845, which illustrated the sun. In 1848 in Dresden, Herman Krone succeeded in photographing two shooting stars, and in New York, Samuel D. Humphrey, developed two plates of the moon, which were widely celebrated and the accompanying notes appeared in the Daguerreian Journal on November 1, 1850.

In America, the observatory at Harvard had been studying astronomy since 1847, and experimented mostly in the field of the daguerreotype. The professional photographer, John Adams Whipple, obtained the first daguerreotype of a star Véga (July 17, 1850), in the company of George Philips Jump the director of the observatory, and then after many failures, captured a daguerreotype of the moon on March 14, 1851. A few days later, they took a daguerreotype of Jupiter. Of this production of the beginning of the 1850s were an estimated 70 plates, of which the location of only ten of the images is currently known. Exhibited at the Great Exhibition in London, 1851, these daguerreotypes of the moon by Whipple and Bond aroused a lot of interest in the scientific community. The comparison with the engraved and drawn charts of the time, in particular with that of Bee and Madler of 1837, made it possible however to reinforce statements made by their authors, according to whom these images offered



Henry, Paul. Photographie Lunaire, Come Sud, 29 Mars 1890. *The Metropolitan Museum of Art, Gift of Rolf Mayer, 1995 (1995, 125). Image © The Metropolitan Museum of Art.*

a "better representation of the surface of the Moon than any drawing." These results were considered modest to doubters. Even though it was used for ten years until 1850, as the only technique and device on which capable of capturing images of the Moon and Sun, one is forced admit that the daguerreotype rendered little service to Astronomy. The success of the images of Whipple and Bond, like the advent of the albumen-on-glass negative (experiments of Niépce de Saint-Victor in France in 51, or of Whipple and Bond in Harvard in 53) and later the collodion, contributed nevertheless to the rebirth of developments in the field of astronomical photography. The numerous experiments, actually, were conducted around the time of the total eclipse of July 28, 1851, and subsequently, the technology existed to capture it. Important for England and John Herschel in particular, a committee was created especially for this occasion, and at Harvard and in Italy around Père Secchi, the astronomers of these colleges were abound. In the British Isles photographs thus far remained exclusively created from the daguerreotype technique, and the advent of collodion marked the beginning period of great activity, and observatories multiplied. Among the numerous astronomers of the period, like Airy, Struve, Hartnupp Lord Rosse, J.B Reade, the principal figure was that of the amateur astronomer and director of printing works, Warren De La Rue, who, since 1851, used photography to document the skies at the end of his observation. Built and installed since 1858 at the observatory of Royal Astronomical Society, in Kew, an instrument called the photohéliographe, which had 1.50 meter long focal glasses, a clock, and a diaphragm or sliding apparatus, which controlled the maximum duration of light, allowed astronomers from day to day, the ability to take photographs of the sun, up to 10 centimetres in diameter. Giving the position and the solar size of the tasks, the first step towards this "history of the Sun" was headed by John Herschel. During the 1860s, nearly 3000 stereotypes of the sun were taken.

It was on the same principle and also using a photohéliographe that Warren de la Rue, photographer of the Royal Astronomical Society in Spain, obtained his images of the solar protuberance at the time of the total eclipse of the sun of July 18, 1860. The comparison of the stereotypes he took on this occasion with those taken at the same time some 400 kilometers away by the father Angelo Secchi of the observatory of the Romain College, made it possible to prove for the first time with certainty, not only the existence, but the origin of these solar phenomena. The photographs taken in Spain on this occasion, undoubtedly seemed the first true success of astronomical photography, and thus closed a chapter opened in 1842 by Alessandro Majocchi in Milan and a decade punctuated by unfruitful attempts in this field.

Another uncontested Master of lunar photography and the sky since 1856, was the amateur New Yorker, Lewis Morris Rutherfurd. Like Warren De La Rue, Rutherfurd was concerned with publishing his work in the United States as well as in Europe. His work, in fact, went well beyond the scientific community and was published in various formats such large mounted prints, cartes-de-visite, stereoscopic views, and albums like *Le Soleil* de Secchi. Presented regularly at the World Fairs, his images of the Sun and especially of the Moon, taken using achromatic lenses of his own design, were often spectacular and greeted with public success. The scientific community remained divided on their actual value for in spite of the undeniable progress achieved in twenty years, much of these stereoscopic views remained indeed less detailed than a number of likenesses drawn by hand, although these images were much less detailed than the photographs of the lunar surfaces, illustrating the work of James Nasmyth and James Carpenter. However, these images were published because of their detail, but were actually achieved by photographing plaster models of the moon.

During the years 1850–70, the astronomer, with the use of the telescope, was able to explore the stellar universe. This sphere of activity for the photographer, in spite of technical difficulties, remained limited to

a negligible part of the solar system, like the Moon, Sun, and at certain times, eclipses. In 1865 Rutherfurd was forced to recognize that "the results obtained by photography" were far from "able to compete with the human vision." Problems varied according to objects being photographed. For objects with weak luminosity like the Moon and stars, the length of the exposure times always constituted the principal difficulty, often forcing the photographer "to compensate" manually the rotational movement of the ground, which left the image at the mercy of atmospheric variations. For taking images of the Sun, the principal obstacle resided in the very strong luminosity, forcing the photographer to opt for less sensitive materials, like albumen-on-glass, daguerreotype, screens to reduce the power of the actinic rays or to reduce the durations considerably, which led to the development of mechanical shutters. The limits of photography were obvious at the time of the transit of Venus, 1874. The scarcity of the phenomenon, since the last passage had taken place in 1769, like the importance at stake, the goal of which was to determine the precise moment Venus appeared to make contact with the Sun, and to precisely calculate the distance from the Sun to the Earth, explained the extent to which photographer went to capture this. Sixty two photographers, equipped with numerous cameras were sent to the four corners of the world, disseminated in two hemispheres, and to eighty different sites of observation. They represented the only international effort ever made to observe "a simple" astronomical phenomenon. On this occasion, Frenchman, Jules Janssen, took his photographs repeating camera which enabled him to take 48 images in 72 seconds on the same plate. During the simple passage of 1874, several hundreds of stereotypes were taken on the various sites. Often of very good quality, however not all were successful. After long years spent analyzing them, in France and abroad, it was necessary to confront the obvious; photography was not better than visual observations and that the distribution of cameras to capture the measurements between Venus and the sun had made it impossible to achieve the precise measurements needed. During the international conference which occurred in Paris in October 1881 to discuss the observations the passage of 1882, the decision was made to return to traditional observation methods for the next year's images. These results did not prevent the astronomer Jules Janssen from proclaiming, based on an expression of Biot's in 1839, that at the end of 1870, photography had become the "true retina of the scientist."

The beginning of the 1880s brought the generalized use of gelatine-bromide, a more sensitive process than collodion, and with it, a type of photography that made it possible to photograph the visible universe. In January 1883, Andrew Ainslee Common, took the first images of stars one night in January in the suburbs of London. Additionally, during the same period, the most powerful telescopes made it possible to see stars as well. Photography had acquired the status of an instrument of discovery, making it possible to capture phenomena that had before then, not been photographable, such as Barnard's with work comets. Photography also facilitated interest in the Milky Way for photographers like Wolff, Barnard, Russell, Roberts, and Gould, all of whom were interested in new planets as well. Owing to Lowell's initiative, an observatory dedicated entirely to the study of Mars was created in Flagstaff, Arizona where photography played an integral part.

The process of developing celestial charts, which was previously done meticulously by hand, was replaced by the favored alternative of the photographic plate. In fact, several observatories launched companies that reproduced these charts. Vis-a-vis with these disordered initiatives, the need for a harmonization was profiled, and in 1887 was held at the observatory of Paris, where the first astrophotographic Congress International met "for the lifting of the sky chart." With this occasion, its director, the admiral Mouchez, summarized the intended ambitions of the project, that "the inventory [be] exact and as complete as possible of the perceptible Universe at the end of the 19th century" allowing these photographers to draw up a sky chart up to stars of the 14th size." Eighteen observatories throughout the world promised participation in this international project.

The company however was large and complex and relied upon a too new technique, which became quickly obsolete. The amalgamation, throughout the 1890s, required harmonization in terms of materials and methods used. Finally established out of this though was the equatorial method developed at one point by the Henry brothers at the Observatory of Paris. In spite of the importance of the company, and the means put into it, the exorbitant cost of the operation mellowed the enthusiasm of some. In the day before of the First World War only the observatories in Paris, of Toulouse and Algiers had partially completed work. Three-quarters of a century after its launching, in 1970, the project was definitively abandoned. In the last quarter of the century however, other atlas companies experimented with photography as well.

At the physical observatory of astronomy of Meudon, the celestial service of photography created by Jules Janssen in 1876 undertook a systematic study of the solar surface. Those principal results were published, between 1896 and 1905, in the astonishing *Atlas de photographies solaires* 1903, which illustrated the precise granulations of the surface of the star. In the field of lunar cartography, it was at the observatory of Paris, 1890, that *L'Atlas photographique de la Lune* was started. Composed of 71 boards from 6,000 stereotypes, published in volumes from 1896 to 1910, the unit still

remains, fifty years after its publication, as a reference tool. During the same time, Lick created his own *Atlas of the Moon* (1903), with a more modest inventory.

The use of photography in the field of Astronomy became accessible and provided useful information to astronomers regarding the physical nature of space. Drawn one time by hand, the detailed spectrum of stars was a work that was long, tiresome, and often required hundreds of hours of observations. Pioneers of the discipline like Draper in 1842, and later Secchi, Vogel, and Huggins all understood that drawings from the photographic plates would lead to the birth of the discipline "spectrography." From the 1880s on, these scientists created lists of characteristics of chemicals observed in space that were isolated and later observed in the laboratory. Those chemicals provided more information about the spectrum of the stars. Lists of these chemicals accompanied photographic atlases such those made by Pickering (1885), Rowland (1888) or Higgs (1891). Later, with the turn of the century, came the spectrohéliogrammes of the solar chromosphere discovered by Deslandres in Meudon and Hale in Chicago, which appears to have been the last photographic contribution of the 19th century to the advent of physical astronomy.

HELENE BOCARD

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ATGET, JEAN-EUGÈNE-AUGUSTE (1857–1927)

Although two thirds of Eugène Atget's photographic career fell into the twentieth century, more than half of his life was lived in the nineteenth century and his esthetic roots were firmly grounded in the earlier period.

An orphan by the age of five, Eugène Atget, after insubstantial schooling in Bordeaux, was briefly a sailor before moving to Paris in1878 in order to attend acting school, which he fitfully did while completing compulsory military service. Dismissed from the school, nevertheless he toured the provinces in minor roles until 1887 when he gave up acting in order to take up painting. This too proved unrewarding and by 1888 he had established himself as a photographer in Clermont. In 1890 in Paris, to which he had again moved, he hung up a sign outside his apartment that read, "documents for artists." These photographs were at first plant and animal studies and landscapes, but he soon embarked on what became an obsessive quest to visually capture the city of Paris, with particular attention to those aspects of its past that were vanishing. For this there was clear precedent in Charles Marville's work in the 1860s, but Marville had imperial patronage while Atget operated wholly on his own with only one important commission.

Gradually he built up a roster of clients, including public institutions like the Musée Carnavalet (the museum of the history of Paris), for the inventory of images he painstakingly assembled of the city's architecture, ancient streets, shop signs and storefront displays, street furniture like lamp posts, itinerant vendors, street fairs, and public markets. One group of photographs represents domestic interiors at various economic levels; another records the remnants of the city's fortifications. He carried out a very extensive series of pictures in public gardens in the city, like those of the Tuilleries and the Luxembourg, and in the old royal parks around the city, like those at Versailles, Fontainebleau, St. Cloud, and Sceaux. These systematically depict garden sculpture, fountains, pavilions, parterres, *allées* of shaped greenery, and individual venerable trees and only rarely are studies of the palaces in these parks.

In the notebooks in which he tracked his ever-expanding encyclopedia of the city and its surrounds, he placed the images in categories of his own invention, like "The Art of Old Paris" and "Picturesque Paris" and "The Environs of Paris." Further, he noted likely buyers for various subjects and the hours at which his clients might likely be found at home. He intended the pictures to serve as references for artisans, illustrators, decorators, publishers, designers for textiles and the building trades, including workers in *boiserie* and wrought iron, and amateur and professional historians of the city. It is noteworthy that he did not photograph nineteenth-century constructions like Charles Garnier's Opera House or the Eiffel Tower, nor the grand boulevards that Haussmann had laid out, nor the elaborate mansions that had been constructed in the fashionable neighborhoods near the Arc de Triomphe. Atget's Paris is not a tourist's Paris. He was far more concerned with the city as experienced in everyday life, from the point of view of the pedestrian, moving around as he did, on foot, during countless solitary photographic rounds, often in less than ideal weather. It is characteristic of his outlook that when he made photographs of shop window displays, they were of unpretentious establishments instead of expensive boutiques. Streetside displays of vegetable vendors and the racks of second hand clothing stores were apt to figure in his works, with the occasional inclusion of a dozing shop attendant, an

observant waiter, or a sleeping cat, all of which although inessential for his purposes augment the sense of the specific texture of ordinary Parisian life. Sideshow attractions at annual neighborhood street fairs were part of a long, but declining tradition, and were of as much interest to him as old structures currently housing modern enterprises like automobile repair shops. Junkyards and squatters' shacks on the outskirts of the city were as appropriate subjects as garden prospects lined with eighteenth-century statues.

The photographs themselves were invariably contact prints, made from seven by nine inch glass negatives, which necessitated a satchel to carry them, and a tripod-mounted camera in which to place them for exposure. The negatives, of which there were eventually about 8500, were usually rendered as albumen prints, until albumen paper became unavailable about 1920 and he was forced to utilize gelatin silver paper. Occasionally, by rephotography, he enlarged portions of his negatives to produce pictures that showed at closer range the intricacies of decorative details in plaster, wood, or iron. He processed his negatives and produced his prints in his modest apartment without the help of assistants, except perhaps the actress, (aptly-named) Valentine Compagnon, whom he met in 1886, and who lived with him until her death shortly before his own in 1923. On the backs of his prints Atget invariably identified the places shown by inscribing street addresses or structure or site names and the number of the arrondissement. His knowledge of and interest in the history of Paris is confirmed by occasional supplemental inscriptions that provide information about a building's former use or the time of its construction.

Atget's importance lies not only in the trove of haunting but apparently straight-forward and objective images of nearly deserted streets of Paris that he produced, but also in the influence of the humble nature of his subject matter and his apparent objectivity on twentieth-century photographers like Walker Evans and Lee Friedlander. He provides an essential bridge between photography in the nineteenth and twentieth centuries. When toward the end of his life he was taken up by Man Ray and the Surrealists, who found inadvertent juxtapositions in his work that were unsettling and intriguing, Atget insisted that he did not have artistic aspirations, that the pictures were, as his sign said, simply meant as documents that could be useful to artists.

GORDON BALDWIN

See Also: Marville, Charles; Albumen Print; Dry Plate Negatives; and Gelatin Silver Print.

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ATHENAEUM

The *Athenaeum* was the leading journal for literary and artistic reviews during the mid nineteenth century. It was launched by James Silk Buckingham as a 9d publication on 2 January 1828. After struggling for the first two years of its existence against its main competitors, the *Literary Gazette* and the *London Weekly Review*, the *Athenaeum* was made into a financial and cultural success when Charles Wentworth Dilke took over the editorship in June 1830. Dilke, whose editorship lasted until 1846, declared war on the puffery that dominated literary reviewing. He also reduced the price of the *Athenaeum* from 8d to 4d, dramatically increasing its circulation to average sales of around 18,000 copies a week.

One of the most distinctive features of the *Athenaeum* was the extensive attention it devoted to popular science. It chronicled in detail the meetings of the most important societies such as the Royal Society, Royal Geographical Society, Royal Asiatic Society, Society of Antiquaries, and British Association for the Advancement for Science. Prior to the publication of the *British Journal of Photography* and the *Photographic News*, the *Athenaeum* is thereby one of the most important indexes to the development of photography. In Jan 1839, its Parisian correspondent described a personal interview with Louis Daguerre that included a demonstration of his new process. During the 1840s and early 1850s, papers on photography read at the Royal Society and the *Academie des Sciences* were enthusiastically published by the *Athenaeum*. These often included precise accounts of the latest chemical processes aimed at improving the quality of photographs. Henry Fox Talbot, Sir John Herschel, and John Jabez Edwin Mayall were amongst those notable figures who had letters or papers printed.

Debates on photography were often played out in the pages of the *Athenaeum*. In May and June 1847, for example, Antoine Claudet and Robert Hunt were involved in a spat over the value of colouring photographs. Similarly, its reviews of the annual exhibition

of the Photographic Society also encouraged the status of photography. They treated the medium as an art by critiquing the pictures as if they were paintings being shown at the Royal Academy. The *Athenaeum* did more than simply report on the latest inventions and exhibitions: it was an important space in which photography was disseminated and debated.

The *Athenaeum's* coverage of photography declined markedly after the early 1860s. Partly, this was due to the increasingly literary and artistic bent of the journal: scientific meetings were no longer reported to the same degree as they were in the previous decades. The decrease in the number of articles also reflects the changing status of the medium itself. As photography became an increasingly commercial medium in the late 1850s and early 1860s, the *Athenaeum* lost interest in both its aesthetic or scientific value. Its review of the 1864 exhibition of the Photographic Society disappointedly noted that it was "the smallest and least interesting of the series." The *Athenaeum* came to an end in June 1911 when it was merged with the *Nation*. However, any serious engagement with photography had ceased several decades earlier.

JOHN PLUNKETT

See Also*: British Journal of Photography; Photographic News (1858-1908);* Daguerre, Louis-Jacques-Mandé; Talbot, William Henry Fox; Herschel, Sir John Frederick William; Mayall, John Jabez Edwin; Claudet, Antoine-François-Jean; and Hunt, Robert.

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ATKINS, ANNA CHILDREN (1799–1871)
British amateur botanist and photographer

Atkins was born Anna Children in Tonbridge, Kent, on 16 March 1799. The only child of John George Children and Hester Anne Holwell, she shared close familial and working relationships with her father after her mother's death in 1800. John Children was a scientist who held positions as Assistant Librarian and Keeper in the developing British Museum and as Fellow and Secretary of The Royal Society. He served as Vice President of the Botanical Society of London, to which Atkins was elected a member in 1839. Children's and Atkins's affiliations helped expose them to the newest in scientific discoveries and facilitated her experiments with photography beginning in the early 1840s.

Atkins, Anna and Anne Dison. Gleichenia Immerse (Jamaica). *The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.*

Before undertaking these experiments, however, Atkins demonstrated her skill as a draftsman of scientific specimens. In 1823 she illustrated Children's translation of Lamarck's *Genera of Shells,* making 256 drawings. These images and the lithographed views of Wooton Church, Warwickshire (published by Charles Hullmandel), and Halstead Church and Halstead Place, Kent, which she produced after her marriage to John Pelly Atkins in 1825, reveal an attention to detail and artistic ability later exhibited in her photographic work with botanical specimens and other objects. When Children retired to the Atkins's home at Halstead Place in 1840, he and Anna Atkins tried their hand at producing photogenic drawings and calotypes—works in two new photographic processes announced by Henry Fox Talbot in 1839 and 1841, respectively—and she adopted Sir John Herschel's 1842 method of the cyanotype.

Children was privy to the groundbreaking results of Talbot's experiments in photogenic drawing almost from their first announcement at the Royal Institution on 25 January 1839. He was a member of the Committee of Papers that met to consider the publication of Talbot's "Some Account of the Art of Photogenic Drawing" and he chaired The Royal Society's meeting at which Talbot delivered the details of his invention. In correspondence, the two men discussed Talbot's process and, receiving samples of Talbot's calotypes in 1841, Children reported that he and Atkins would soon try out the new paper negative photography. That year Children purchased a camera for Atkins from Andrew Ross, but both his and Atkins's success with the instrument is uncertain. No known calotype prints by Children or Atkins survive.

It is likely that father and daughter found a more fruitful source for their scientific experimentation with Talbot's use of plants in his photogenic drawings. Reflecting Talbot's botanical example and possibly his desire to produce such a volume, Anna Atkins recorded specimens of seaweed with photograms in her serially-published work entitled *British Algae: Cyanotype Impressions* (1843–1853)—what many scholars have acknowledged as the first photographically-illustrated book. Rather than using Talbot's technical methods, however, she employed Sir John Herschel's cheaper and more permanent photographic procedure of the cyanotype.

Atkins quickly took up the cyanotype process in 1842 after Herschel, a wide-ranging scientific researcher and family friend, sent to Children his recently published paper containing the blueprint procedure. Coating her paper with a mixture of ferric ammonium citrate and potassium ferricyanide and exposing the dried paper to light for a brief period of minutes, Atkins could utilize fine specimens of "Ptilota sericea" and "Himanthalia lorea" as negatives which, when contact printed under the pressure of glass (or between sheets of mica?), would produce photograms of striking white images against a rich ground of Prussian blue. Intent on the information of size, shape, structure, and degree of transparency conveyed by each labeled example, she would have found the blueprint medium an appropriate and effective one for delineating the delicate "flowers of the sea." Additionally, the photographic process was conducive for producing multiple prints of the same specimen. With it, Atkins assembled more than a dozen copies of *British Algae* which she presented to scientific colleagues and institutions throughout Great Britain.

Atkins loosely based the organization and classification of *British Algae* upon that of William Harvey's 1841 *Manual of British Algae*, announcing in her preface that "I have intentionally departed from the systematic arrangement that I might give specimens of very various characters as a sample." The three-volume work—originally issued serially in 13 parts between 1843 and 1851—was to contain 14 pages of text and 389 pages of captioned plates. These parts, when rearranged into volumes between 1851 and 1853, included title pages, indexes, and an appendix that the books' recipients could order according to Atkins's inserted instructions.

With few references to the locations of collection for her specimens and no indication of the species' status in Harvey's color-coding system of red, green, and olive-green groups, *British Algae* did not present an entirely scientific case study. As Carol Armstrong has argued, however, although Atkins's project lacked in rigorous method, it demonstrated that she enjoyed the freedom to work "at the outer limits of the patriarchal conduct of normal science" in a way that might be seen to problematize "the system of positivist classification and the apparatus of the illustration" that would dominate much of the scientific literature of the 19th century (See Further Reading). The beauty and uniqueness of her publication continued to impress photographic practitioners and students of botany despite the fact that, by the 1850s, other books using drawn specimens, dried and mounted specimens, or images produced by Alois Auer's nature printing technique had rendered Atkins's work obsolete.

Halting publication for a year upon her father's death in 1852, Atkins authored a *Memoir of John George Children, Esq*., and then finished the final volume of *British Algae* in October 1853. With the decade-long project completed, she continued to make cyanotype photograms in collaboration with her close friend, Anne Dixon. Between 1852 and Dixon's death in 1864, the two women produced three presentation albums: *Cyanotypes of British and Foreign Ferns*, *Cyanotypes of British and Foreign Flowering Plants and Ferns*, and an unnamed third album (with the possible assistance of Herschel's daughter, Isabella Herschel) featuring photograms of botanical specimens, feathers, and lace such as "Peacock," "Emu," and "Papaver rhoes".

Atkins died at Halstead Place on 9 June 1871.

MEREDITH KEY SOLES

Biography

Anna Atkins was born Anna Children on 16 March 1799 in Tonbridge, Kent. Although her mother, Hester Anne Holwell, died of lingering complications from childbirth in 1800, Atkins shared a close bond with her father, John George Children. She married John Pelly Atkins, a county sheriff, railroad promoter, and Jamaican coffee plantation owner, in 1825. Atkins published *British Algae: Cyanotype Impressions* between 1843 and 1853. Interrupting this project for a year after her father's death, she produced a *Memoir of John George Children, Esq*. (1853). In collaboration with her childhood friend,

Anne Dixon [?–1864], she completed three presentation albums of cyanotype photograms: *Cyanotypes of British and Foreign Ferns* (*c*.1853), *Cyanotypes of British and Foreign Flowering Plants and Ferns* (*c*.1854), and an unnamed third album of botanical species, feathers, and lace (*c*.1861). Her photographic work was not included in exhibitions during her lifetime but was referenced in publications by Talbot ["On photography without the use of silver," in *The British Journal of Photography*, XI (9 December 1864), 495] and by historian Robert Hunt ["On the applications of science to the fine and useful arts. Photography—second part," in *The Art-Union*, (1848), 237–38]. Atkins died at Halstead Place on 9 June 1871.

See Also: Talbot, William Henry Fox; Herschel, Sir John Frederick William; Cyanotype; Photogrammetry; Photogenic Drawing Negative; and Calotype and Talbotype.

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AUBERT, FRANÇOIS (1829–1906)

French, photographer, active Mexico 1864–1867

Born in France, Aubert trained as a painter at the *Ecole des Beaux Arts* in Lyon and exhibited at the 1851 Salon. In 1864 he left for Mexico and the court of the newly-installed Emperor Maximilian which seemed a likely source of patronage. Shortly after his arrival in Mexico City, the young painter learned photography and either purchased or assumed the lease for a photographic studio previously occupied by Jules Amiel. Aubert established himself with official portraits of the Emperor and Empress, as well as portraits of officials, ladies of the court and military officers. He produced portraits in full size and carte-de-visite formats. Work from the studio bears the stamp Aubert et Cie and it is presumed that the work of the studio was performed by Aubert and some number of employee/operators. He (or his studio) is best known

Auber, Francios. The Shirt of the Emperor, Worn During His Execution.
The Metropolitan Museum of Art, Gilman Collection, Purchase. Gift of the Howard Gilman Foundation, 2005 (2005, 100. 213). Image © The Metropolitan Museum of Art.

for photographs of the participants and relics associated with the execution of Maximilian by firing squad in 1867. The series includes a group portrait of the firing squad, Maximilian's torn and bloody clothing, the sites of his execution and grave, and a portrait of Maximilian in his coffin. Aubert offered these "historical views" by prepaid subscription as full size prints or in carte-de-visite sets. In 1867, Aubert left Mexico. It does not appear that he practiced photography in Europe.

KATHLEEN HOWE

AUCTION HOUSES AND DEALERS

By the mid-1850s several dealers in London were offering photographs for sale, mainly by British and French photographers. Their premises were not devoted exclusively to the new art: Murray & Heath, the prominent dealers at 43 Piccadilly advertised as Photographic Instrument Makers, while Hogarth, Hering, Gladwell and Spooner were primarily print-sellers. They sold individual photographs; albums and photographs published in portfolios or books and lent works for sale to

exhibitions of the leading photographic societies. These events provided another opportunity for photographers to sell examples of their work. In 1859 the organisers of the sixth annual exhibition of the Photographic Society of London even allowed the inclusion of prices in the exhibition catalogue. Significant sales were handled by early agents, e.g. in 1865, the London art dealers, Colnaghi, sold eighty photographs by Julia Margaret Cameron to Henry Cole for the South Kensington Museum.

In Paris, the other early centre for photography, sales of the new medium were also handled by painting dealers such as Durand-Ruel or Legrand, print dealers or booksellers. The gallery or shop-owner usually took a share of the profits from a sale rather than owning the works outright. Throughout the 19th century, photographers and publishers such as Goupil, Blanquart-Evrard, Mansell**,** Agnew or Frith sold works direct as well as through more general print dealers and booksellers.

Seminal galleries in America, such as Stieglitz's "291" rarely showed historical works, although New York art dealer, Julien Levy, opened his gallery in 1931 with a retrospective of *American Photography*, organised in collaboration with Stieglitz. Levy went on to exhibit works by contemporary American and European photographers, but also included shows of Atget and Nadar. He quickly realised photography could not support the gallery financially and introduced a greater proportion of painting and sculpture. Nevertheless, many photographers shown by Levy in the early 1930s went on to become recognised and promoted by the Museum of Modern Art, when Beaumont Newhall introduced photography there in 1937.

Other galleries in Paris and New York were showing exhibitions of photographs, but again, the emphasis was on contemporary material and none could survive on photography shows alone. In 1954, Helen Gee opened her *Limelight* gallery and coffee bar in New York. She struggled too, surviving only until 1961, even with the income from the café subsidising the photography gallery. However, among her few buyers were those capable of influencing many: her last sale, of Julia Margaret Cameron's portrait of Julia Duckworth, was to Beaumont Newhall.

In post World War I Europe, where there were already a few active collectors of historical photographs, the sources for old photographs were antiquarian booksellers, general antique shops and markets, especially the flea markets of Paris.

There were no regular auctions of photographs until the early 1970s, but sporadic bursts of activity during earlier periods injected notable caches of material into the market place. Probably the earliest and most significant of these were the auctions of works by Roger Fenton. The commercial failure of his Crimean photographs prompted the publishers, T. & R. Agnew & Sons, to dispose of "all remaining copies of Fenton's Photo Pictures of the War In The Crimea" through the auctioneers Southgate & Barrett on November 29, 1856, "and five following evenings." The art dealers, Colnaghi, advertised Fenton's negatives for sale in January 1857, possibly having acquired them from this auction and in 1862, when Fenton quit photography, auctioneers J. C. Stevens sold "instruments, cameras and photo views of England & Wales by Roger Fenton."

Occasional dealer catalogues including old photographs had appeared since an important example compiled by E. Weil and published by London bookseller, E. P. Goldschmidt in 1939. Others followed this practice in the early 1970s such as the American dealer, George Rinhart, offering "Americana, Photographic Images and Rare Books."

Lee Witkin is considered the first successful modern dealer in photographs, his New York gallery opening in 1968 and establishing a precedent that was to be followed by others. Witkin maintained a stock of 19th century photographs, but like most other galleries in America, modern and contemporary photography predominated. With an occasional exception, such as the influential Galerie Texbraun in Paris, it was left to a handful of private dealers to nurture a still embryonic secondary market for historical photographs. Led again by American interest, a small network of dealers became established in the late 1960s and early 1970s, mostly in the USA but including prominent figures in England and France.

The auction houses now took the decision to enter what could reasonably be perceived as an emerging market. The specialist book auctioneers, Swann Galleries had been responsible for the first photograph auction in the United States with the Marshall sale in 1952 and Sotheby Parke Bernet held two successful sales from the estates of Will Weissberg and Sidney Strober in 1967 and 1970, but the first of the regular auctions was held at Sotheby's Belgravia saleroom in London in 1971. Christie's followed with auctions in London, and soon after both houses introduced sales in New York, as did Swann Galleries.

From the beginning London auctions were the focus for 19th-century material while 20th-century works dominated in New York. London quickly became the primary source for 19th century photographs fresh to the market; the publicity generated by early sales attracting important private consignments of archives and collections, many of which had long languished in dusty basements or attics. By the 1980s, when the Getty Museum made the decision to collect photographs they were able to acquire several ready-made collections including that of Sam Wagstaff, a key figure in the London auctions. Other notable collections including those of

the Canadian Center for Architecture and the Howard Gilman Foundation include rare treasures, which emanated directly from Christie's South Kensington or Sotheby's Belgravia. There can be few collections of 19th century photographs established since the 1970s that do not include auction purchases made either directly or acquired later through dealers.

Like other markets there has been gradual evolution and during the 1990s, the lure of regular auctions in Paris attracted international dealers and collectors. Again, examples have made their way into such famed collections as those of the Metropolitan Museum of Art in New York.

The complex relationship between museum curators, collectors, dealers and auctioneers is both competitive and supportive and has played a major part in the rescue and recognition of works by many photographers. Through such discoveries our knowledge of photography's history has been enhanced. The role of auction houses and dealers has contributed to the gradual acceptance of the historical and aesthetic importance of 19th century photographs.

LINDSEY S. STEWART

See Also: Murray & Heath, Vernon; Hering, Henry & Co.; Photographic Exchange Club and Photographic Society Club, London; Cameron, Julia Margaret; Cole, Sir Henry; South Kensington Museum; Goupil & Cie; Blanquart-Evrard, Louis-Désiré; Mansell, Thomas Lukis; Agnew, Thomas and Sons; Frith, Francis; Stieglitz, Alfred; Atget, Jean-Eugène-Auguste; Nadar (Gaspard-Félix Tournachon); Newhall, Beaumont and Nancy; and Fenton, Roger.

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AUSTRALIA

When the French barque *Justine* arrived in Sydney from Valparaiso, Chile, via New Zealand on 29 March 1841, Gallic Captain, Augustin Lucas (1804–54?) brought with him a daguerreotype camera and plates. His arrival was only a few days after Richard Beard (1801–85) opened London's first studio in Regent Street on 23 March 1841. The *Australasian Chronicle* of 13 April reported Lucas's intention to "dispose of the instrument at prime cost. The purchaser will be fully instructed in the method of taking views." A demonstration by a number of "gentlemen" took place a month later on 13 May. "At the stores of Messrs Joubert and Murphy, an interesting trial of the advantages of the Daguerreotype was made on Thursday, at which we were present, and received the politest attention at the hands of the gentlemen who conducted the experiment...an astonishingly minute and beautiful sketch was taken of Bridge-street and part of George-street, as it appeared from the Fountain in Macquarie-place" (*Australian,* 15 May 1841). No trace of the first photograph made in Australia has been found since its announcement over 164 years ago.

Captain Lucas returned to France in the *Justine* on 3 June 1841 (*Sydney Morning Herald,* 4 June 1841).The equipment may have been sold to one of the reported witnesses, Didier Numa Jourbert (1816–81), a French wine and spirit merchant and partner of Irishman Jeremiah Murphy. In 1843 Jourbert sold "a very superior daguerreotype [camera], complete, with all the apparatus, and a great number of plates" along with the contents of his Macquarie place household before leaving for Europe (*Sydney Morning Herald,* 21 March 1843).

No further mention of photography by the media is known until the arrival of George Baron Goodman (w. 1842–48, died 1851) the first professional photographer in Australia. Goodman was a Beard licensee who arrived in the *Eden* at Sydney on 5 November 1842 (*Sydney Morning Herald*). Goodman made around seventy miniature portraits in his "laboratory," a blue glass conservatory designed to capture the sun on the roof of the Royal Hotel in George Street. A week prior to the public opening, he showed them to the press. "The likenesses are indeed exact, and the sitter is only kept in suspense about half a minute…The charge is extremely moderate—a portrait, frame and case being less than the cost of a new hat, or a box at the theatre" (*Sydney Morning Herald*, 13 December 1842).

Goodman advertised to provide sitters with "highly finished reflections of themselves" (*Hobart Town Crier and Van Diemen's Land Gazette*, 6 October 1843), but it seems his daguerreotypes disappointed many sitters with their likenesses. A common complaint was the blue-grey deathly pallor. Extant daguerreotypes by Goodman verify the inadequacies of his technique, but with virtually no competition from any other photographers, he had a monopoly during the four and half years he was in business.

With the economic depression depleting customers in

Sydney, Goodman became an itinerant photographer. He travelled to Hobart Town, Van Diemen's Land in August 1843. He soon discovered he had a competitor, the portrait painter Thomas Bock (1790–1855) who advertised his intention to "take photographic likenesses in the first style of the art" (*Hobart Town Advertiser*, 29 September 1843). As a Beard licensee, Goodman threatened Bock with legal action. Bock withdrew, deferring professional daguerreotyping until Goodman had retired in Sydney in 1847. Before Goodman's departure from Hobart in February 1844, he displayed daguerreotype views of the city which were bought by Colonial Secretary, J.E. Bicheno, but these do not survive.

While Goodman was in Tasmania, two English professional photographers, C. and J. Trood, (w.1843–44) late of Claudet's Royal Adelaide Gallery of Arts and Sciences, swooped into Sydney in December 1843 and advertised coloured daguerreotype portraits for one guinea to £1.10s each, including morocco case. By the time Goodman returned to Sydney in March the Trood's had moved on, thus avoiding the litigious Goodman. Joubert and Murphy (their partnership resumed) must have recognised that Goodman's hold over the British colonies was collapsing with the sale of his business in April 1847 to his brother-in-law, Isaac Polack (w. 1845–51). At the end of the month they advertised "four complete Daguerreotype apparatus, with all the latest improvements, and a number of plates" (*Sydney Morning Herald*, 30 April 1847).

The first resident Hobart photographer, stationer and lithographer, Thomas Browne (1816–70) began taking daguerreotype portraits in September 1846. By 1847 his portraits could be taken without the aid of direct sunlight, Browne advertising that his portraits "are always taken in the shade, in which persons can better preserve a natural and pleasing expression of countenance. The early hours of the day are generally more favourable" (Moore's *Hobart Town Directory*, 1847).

While Goodman's 1844 Hobart views remain elusive, Australia's earliest extant view daguerreotype survives in the Tasmanian Museum and Art Gallery. This full plate of Murray Street, Hobart was taken in December 1848 by British itinerant daguerreotypist, J.W. Newland (w. 1848–49, died 1857) (*Hobart Town Courier*, 9 December 1848). It is a remarkable image for not only does it record the principal buildings, harbour and distant mountains, but people going about their daily business in the main street. Newland's stock portraits and views were exhibited at his Daguerrean Gallery in Murray Street, including 200 portraits of exotic people such as the King and Queen of Otaheite (Tahiti) made on stops during his journey across the Pacific ocean.

Australia's indigenous population was also photographed in the 1840s, but few images survive. Douglas T. Kilburn (1811–71), brother of William E. Kilburn (w. 1847–64), the London society photographer, established the first professional photographic studio in Little Collins Street, Melbourne, Victoria in 1847. In October, only two months after setting up, he paid local Aborigines, Koories from the Yarra Yarra tribe to sit for him. Kilburn recounted that the sitters were "superstitious" and fearful of "some misfortune" in having their portraits made (*Illustrated London News*, 26 January 1850: 53). It appears that not one of the men and women sat twice, despite his inducements, "…as upon seeing their likenesses so suddenly fixed, they took him for nothing less than a sorcerer." (*Papers and Proceedings*..., vol. 2, 1850–53: 504). Several of the portraits (thought to number as many as ten) were copied for engravings in 1848, 1849 and 1850. These have been identified with three daguerreotypes in the collection of the National Gallery of Victoria.

Another ten years passed before anyone again showed interest in photographing indigenous people. Aborigines were photographed in Western Australia in February 1858 by Royal Navy Lieutenant and amateur photographer, Arthur Onslow (1809–79) of the *HMS Herald* during his visit to King George Sound, Albany. Like Douglas Kilburn, he paid the frightened men to pose: "At first, I had great trouble getting them to sit, as they were afraid we w[oul]d. cause their death." Onslow added, "by giving them 6d. they plucked up courage enough to let me bring the lens to bear on them but they are bad sitters" (Arthur Onslow Journal 1857–61, 7 February 1858).

It was widely thought that the Aboriginal people were a "dying race" soon to become extinct through warfare with the European colonists. To "save" them, George Augustus Robinson, the Methodist 'protector' of the Aborigines in Van Diemen's Land removed them to Flinders Island in 1834. By 1847 only 44 people had survived due to their lack of immunity to European diseases. They were moved to a reserve at Oyster Cove, near Hobart.

The Bishop of Van Diemen's Land, Francis Russell Nixon (1803–79) an amateur photographer, made photographs of nine members of the Oyster Cove Coal Tribe in March 1858. These early photographs of Tasmanian Aborigines remained little known until the professional photographer, John Watt Beattie (1859–1930) made copies for sale to the tourist trade under his own name in the 1890s. Beattie also copied professional carte-de-visite portraits made by Charles Woolley (1834–1922) of the remaining five Oyster Cove Aborigines then alive in August 1866. The most well known are portraits of Truganini (Lallah Rookh), (Bessy Clarke), and King Billy (William Lanne).

Two years earlier in late 1864, Henry A. Frith (w. 1854–67) photographed the same three people, as well as another woman called "Mary-Ann" (also called "Pat-

sy"). Marketed as *The Last of the Tasmanian Natives*, Mary Ann, Truganini and Pinnanbothac were dressed in crinolines and William Lanne in a three piece suit. The women wore head-dresses of Oyster Cove shells to signify their Tasmanian origin. The publication of this photograph as an engraving in the *Illustrated Sydney News* (November 1864) and the *Illustrated London Journal* (January 1865) achieved international notoriety.

German born photographers appear to have had an anthropological predilection for photographing Aboriginals in all corners of Australia. Charles Walter (1831–1907) made view stereographs of Aborigines at prayer in European clothing at Lake Tyers Mission Station, Gippsland and ethnographic portraits of people at Coranderkk in 1867–68. Frederick Kruger (1831–88) visited Coranderrk in 1877 to take portraits of Aboriginals for the Victorian Board for the Protection of Aborigines. Copies were sold in albums. John William Lindt (1845–1926) made a tableau vivant portfolio of "Australian Aboriginals" in his studio at Grafton, New South Wales in 1873–74. Semi-naked for white people's gaze, the anonymous people with their traditional clothing and weapons are uncomfortably displaced against painted backdrops, dried flora and dead native fauna. These images were widely published in the 1880s as engravings in encyclopaedias. In the far north, Police Inspector, Paul Foelsche (1831–1914) made forty-eight portraits of Port Darwin and Port Essington Aboriginals which were displayed by the South Australian government in the Sydney International Exhibition of 1879.

The first commercial portfolio to contain views of Melbourne, the Victorian goldfields and Aborigines was *Sun Pictures of Victoria* by Frenchman Antoine Fauchery (1823–61) and Richard Daintree (1832–78). Produced in ten monthly instalments, from November 1857 to early 1859, each part had five albumen photographs mounted on card (La Trobe Library, State Library of Victoria). Before leaving Melbourne in February 1859, Fauchery summed the series up in a letter accompanying an album to the French Minister of Public Instruction and Worship: "There are some of great men, some of towns, some of the mines, some of the savages. There is a little of everything."

Fauchery became an official war correspondent and photographer for the French expeditionary force in China. Daintree, a trained geologist made hundreds of photographs of Queensland in his capacity as the Geological Surveyor of North Queensland. After taking an exhibition of his pictures and mineral specimens to London in 1871, he was appointed the London Agent-General for Queensland from 1872–76. His landscape views were scientific and as well as documentary, inspiring others to take their photographic vans into the country for the views trade.

Paper photographs became the choice of amateurs and professionals alike as soon as the collodion wet plate process arrived in Australia in 1854. Prints made from the calotype had a brief flush of popularity in the 1850s with amateurs, but because of the long exposures involved was little used by professionals. Daguerreotypes were more durable in their cases, and although in decline after 1860, were still available until the late 1860s. Cased ambrotypes were popular from 1855 until 1865. The American trained photographer, Thomas Skelton Glaister (1824–1904) and the Freeman Brothers (w. 1853–95) from England specialised in the collodion ambrotype. Joseph Lyne Brown (w. 1854–80) introduced the process to Sydney in 1854 and J. S. Scarlett (w. 1854) to Melbourne the same year. William Blackwood (1824–97) and James Freeman (1814–90) saw the advantage of using the collodion glass negative to make limitless albumen paper copies before the ambrotype completely fell out of favour.

The *carte-de-visite* (cdv) was patented by A.A.E. Disdéri on 27 November 1854 and introduced to Britain by the French firm A. Marion and Company, but received little notice there or in Australia until some years later.

William Blackwood announced the Australian launch of the cdv on 12 May 1859. This "Novelty in the Fine Arts" a new style of miniature visiting card portrait was available for 12 shillings a dozen. The *Sydney Morning Herald* prophesised: "Truly this *is* producing portraits for the million." Although meant metaphorically, it would be some time before the population approached this figure as only 350,000 people lived in the colony of New South Wales in 1859. Indeed, the whole of Australia's population did not exceed one million until 1861.

Blackwood's announcement met with total public indifference. He re-advertised "portraits on visiting cards" on 18 May, but not again. In fact this indifference extended to the whole Sydney profession as no one else advertised "visiting cards" in the *Sydney Morning Herald* until 9 November 1860. Why? An important accessory was missing—the photograph album.

John Jabez Edwin Mayall's (1810–1901) portraits of the British Royal family taken at Buckingham Palace on 10 May and I July 1860 launched the cdv in the British Empire and the United States of America. Copies of Mayall's portraits housed in the *Royal Album* arrived in Sydney by 18 October 1860 ("Per Overland Mail," *Sydney Morning Herald*).

Sydney photographer William Hetzer (w. 1850–67) can be credited with the successful introduction of the cdv to Australia in 1860. In 1858, noticing the popularity of imported stereographs, he created a market for stereographic views of Sydney and its surrounds. Eighteen months later he created the market for the carte-de-visite album portrait in Australia.

Hetzer seemed to have an instinct for predicting new photographic fads. On 10 November 1860 he advertised in the *Sydney Morning Herald* that he had imported a camera "expressly adapted for the new style of Portraits aux Cartes." Hetzer's order for camera and supplies was timely, enabling him to be the first to market the new process in Sydney. Blackwood, the original proponent in 1859, did not advertise cdvs again until December 1861.

Mayall's *Royal Album* with its portraits of the Royal family provided the impetus for people to have their own *family album*. Next to the Bible, the photographic album was a family's most treasured possession. It was a compact and portable memory bank designed for cdvs and later for tintypes. It approached the size of a Bible when it was upsized for cabinet cards and views. Its shape changed for Kodak prints and postcards at the turn of the century. The album became the principal repository for all kinds of photographic images, and remained so until the widespread use of digital imaging and computer storage in recent years. However, the album never lost its usefulness or popularity.

As a result of the success of the cdv and negative photography, the number of photographers leapt in the 1860s. Before the gold rush of 1851 there were less than six daguerreotypists in Australia. There were 249 professional, amateur and travelling photographers working across the country from 1850 to 1859. Between 1860 and 1870, the number of photographers in Australia rose to 367. Of these, only about 43 were travelling photographers. From 1866, following the Melbourne Intercolonial Exhibition, many photographers advertised their awards on the back of their cdv cards and on view cards sold in portfolios or individually for framing.

Many photographers stayed in the trade only a few months when they found that profits could not be sustained. Some, perhaps uncertain whether the boom would last, retained two professions. John Sharp (1823–99) of Hobart Town was Governor Young's dentist, as well as a photographer, photographic supplier and retailer in stereo-views of Tasmanian scenery from 1856–62. Together with Frederick Frith he made a five part panorama of Hobart from the Domain in January 1856. This panorama is seen as the beginning of the views trade in Australia.

News of the Tasmanian panorama spread to Sydney and Melbourne, where photographers quickly followed suit by making larger panoramas. In Melbourne, Walter Woodbury (1834–85) (inventor of the *Woodburytype*) made an eight part panorama of the streets of Melbourne in circa 1857. Ten part panoramas of Sydney were made in 1858 by the Freeman Brothers and William Blackwood.

Panoramas were expensive and sales were low compared with the small and ubiquitous cdv. The cdv was perfect for portraits of people posed in their "Sunday Best," however there were rigid conventions and a narrow catalogue of orthodox poses for studio portraiture. Exceptions to the "house-style" were made by itinerant photographers who seemed as interested in real estate as much as portraiture. Men, women and children responded enthusiastically to requests by itinerant photographers to pose outdoors in front of their residences, modest or grand. Shop owners stood with their staff and customers in front of their shops free from the constricting apparatus of the studio.

Street photography had been tried by Charles Dicker (w. 1861) who exhibited twenty four ambrotypes at the Victorian Exhibition "illustrative of the buildings and places around Dunolly" (*Argus*, 8 October 1861). These outdoor portrait-views were a precursor to cdv itinerant photography, but it seems Dicker met with little commercial success. Only twenty two plates survive and are now part of the La Trobe Library, State Library of Victoria.

The finest exponents of itinerant street photography were Henry Beaufoy Merlin (c. 1830–73) and his assistant, Charles Bayliss (1850–97). In September 1870 the Englishman and Australasian Photographic Company said it would "photograph every public building, shop, and private residence in Sydney." They claimed to have created a "revolution…in street photography…within the last 2 years they have photographed almost every house in Melbourne, and the other towns of Victoria" (*Sydney Morning Herald*, 21 September 1870). In 1873 Merlin and Bayliss arrived at Hill End, New South Wales, where they documented the burgeoning gold mining town and nearby Gulgong. Their studio was built on land owned by their future patron, German emigrant Bernard Otto Holtermann (1838–85).

Holtermann hoped to play a vital role in introducing photographs of Australian urban life and scenery to the world. He came into serious wealth as a major shareholder and mining manager of the *Star of Hope* Gold Mining Company which in 1872 uncovered the world's largest specimen of reef gold, standing 144 centimetres high. It was valued at over 50,000 pounds, a fortune at the time. Seeing the excellence of his tenant's photographs, he engaged Merlin to help him with his vision to promote migration to Australia through photography. Using Daintree's example for the *London Exhibition of Art and Industry* of 1871, he proposed that New South Wales should do the same with "Holtermann's International Travelling Exposition" of panoramic photographs, minerals, models of machinery, raw materials, zoological specimens and natural produce.

When Merlin died of pneumonia in September 1873, Bayliss took over Holtermann's project. He travelled to Ballarat, Victoria in 1874 where he made a nine part 360 degree panorama of the mining city from the tower in the Town Hall. In 1875 he positioned himself in the

tower of Holtermann's mansion in North Sydney to make a 22 part panorama of Sydney Harbour and suburbs. The glass plates were each 55.8 × 45.7 centimetres and when the prints were joined together they formed a view almost ten metres long. The "Holtermann Panorama" was exhibited in the USA and Europe winning competition medals at the Philadelphia Centennial of 1876 and the Paris Exposition Universelle Internationale in 1878.

Daintree's and Holtermann's promotion of their colonies' virtues led to the commissioning of photographers by the Government Printing Office's in other Australian colonies. Some of the most interesting views were made for exhibition in inter-colonial and overseas exhibitions, and for presentation to politicians and foreign dignitaries. None of the government photographs were for sale to the public so as not to interfere with the commercial views trade.

Photographically illustrated books were produced from the early 1860s on diverse scientific topics such as medicine, astronomy, geology, natural history, anthropology and expeditions, replacing the publishing norm of intaglio and lithographic plates with real photographs. The most outstanding book of its kind is the *Narrative of the Expedition of the Australian Squadron to the South–East Coast of New Guinea, October to December, 1884*, published by Thomas Richards, NSW Government Printer in 1885. The 35 photographs recording the proclamation of the British Protectorate on 6 November 1884 were taken by Augustine Dyer (w. 1873–1923) and John Paine (w. 1873–91).

Charles Nettleton (1826–1902), a regular exhibitor at colonial exhibitions from 1868 specialised in view photographs which he sold in albums. Nettleton was also an official penal photographer from the 1870s. He made full length cdv portraits of the bushrangers Harry Power in 1870 and ten years later of outlaw Edward "Ned" Kelly. On the day prior to his execution at Pentridge Goal on 11 November 1880, Kelly asked that "his photograph [be] taken by a departmental operator and copies [will] be given to his friends" (*Argus*, 11 November 1880).

An Australian icon then and now, following his capture at Glenrowan on 28 June 1880, Ned Kelly had been tried and sentenced to death by hanging. His 'gang'—three young men aged in their twenties—died in "The Glenrowan Inn," after it was set on fire by the police. The next day, the scorched and smoke blackened corpse of Joe Byrne, which had been dragged clear of the fire, was brought to Benalla and strung up on the door of the police lock-up for photography. J. W. Lindt photographed his colleague Arthur W. Burman (w. 1878–96) at his grisly work.

Live-action photographs of the fire at the hotel, its smoky progress and aftermath were taken by the unknown Oswald Thomas Madeley (w. 1880) who set his tripod up in the midst of the police siege. A set of nineteen photographs is held in the Copyright Collection, La Trobe Library, State Library of Victoria. It seems Madeley sold the rights to some of these dramatic images to James E. Bray (w. 1865–91) of Beechworth and to Burman who together made cdvs from Madeley's negatives selling them under each other's imprint.

Introduced in 1880, the dry plate provided greater freedom and flexibility for portraiture, enabling preparation of plates in advance, as well as a lighter load when travelling outdoors.

Victorian Nicholas Caire (1837–1918) was a specialist landscape photographer "in search of the picturesque." Always scouting for sites within striking distance of Melbourne, he specialised in fern gully scenes around Healesville sparking a new interest by the public in recreational tourism and the outdoors. J. W. Lindt also specialised in views of the fern-tree gullies and bush around Fernshaw. In 1887 landscape photographs by Bayliss, Lindt and Caire were lithographically reproduced in colour from original negatives by the Sydney printers Phillip-Stephan (1887–1910).

A new nationalism in photography and landscape painting arose from the late 1880s. By the end of the century, souvenir photographs, photolithographs and postcards could be bought of the new tourist routes opened up by railways.

Amateur photographic societies were founded in 1885 in South Australia and Queensland allowing a new group of amateurs to exhibit their work in local and inter-colonial competitions. Photographic magazines like the *Australian Photographic Journal* founded in 1886, and others, greatly increased the interest in photography.

Around 1890 silver bromide gelatine coated papers were introduced allowing prints to be developed more quickly. Pictorial photographers such as John Kauffmann (1864–1942) used bromide paper for soft-focus photographs which were "mistaken for works of art." (*South Australian Register*, 19 October 1901) Kauffman had witnessed the Pictorial movement in Europe and was an early convert. He operated a successful business in Melbourne until the mid 1930s.

The Kodak pocket camera was released in Australia in 1896. It was aimed at the snapshot photographer, rather than the true amateurs who were used to darkroom developing, printing and toning their work. Women were encouraged to take up snap-shot photography to provide "an outlet for the dormant artistic tendencies locked up in the minds of so many women" (*Australian Photographic Journal*, 20 April 1897). The earliest known female amateur was Louisa Elizabeth How (1821–93) who made an album of salted paper prints from 1857–59. Only twelve women are recorded as working as professionals during the late 1850s and 1860s. Some operated

independently, others were the wives of commercial photographers.

The Federation of the colonial States into the Commonwealth of Australia in 1901 was a cause for celebration. Also celebrated was Australia's pastoral prosperity as "the land of the Golden Fleece." "Rose's Stereoscopic Views" of triumphal arches, illuminations and buntings on light poles and bridges are perhaps the most well known images of an otherwise forgotten photographic moment. Yet the new millennium was distinguished by a national enthusiasm for Australia's natural assets—gum trees, sun and light which became the mainstay in pictorial photography, painting, printmaking and decorative arts until the Great War.

WARWICK REEDER

See Also: Beard, Richard; Daguerre, Louis-Jacques-Mandé; Claudet, Antoine-François-Jean; and Mayall, John Jabez Edwin**.**

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AUTOTYPE FINE ART COMPANY

The Autotype Fine Art Company began life in 1868 as the Autotype Printing and Publishing Company, with a factory in Brixton and offices at 5 Haymarket in London. From its inception to the present day the company has been involved in a variety of methods of producing images and imaging materials. For almost a hundred years, however, it was best known for its exploitation of Joseph Wilson Swan's Carbon Process, a method of producing prints in permanent pigments.

Swan patented his process in England in 1864 (No 503) and originally worked the process commercially himself. In 1868 he sold the English rights to a chemist, John Richard Johnson, and a photographer, Ernest Edwards, both of London. The same year, the rights were in turn acquired by the newly formed Autotype Printing and Publishing Company, with Johnson and Edwards becoming major shareholders. The name Autotype had been devised before the company existed, possibly as early as 1864. It was proposed by art critic and one time editor of Punch, Tom Taylor, and derived from two Greek words, 'autos' meaning self, and 'tupos' meaning stamp, as in the impress of a seal.

The merits of the carbon process, rich tonal range and, particularly, its permanence soon commended itself to other photographic entrepreneurs. Almost immediately, rivals announced a series of doubtful 'improvements' to the process and the company was forced to assert its patent rights. The company successfully defended its position, either in court or by buying out the opposition. Under the company's umbrella, Johnson was also working on improvements to Swan's original process and new patents were filed in February 1869 and January 1870.

Despite its early problems, the company successfully developed the business of supplying carbon printing materials as well as making carbon prints for the photographic trade and to sell directly to the public. In 1870, the London office was transferred to 36 Rathbone Place, next door to the artists' suppliers, Windsor & Newton. The factory was also moved from the original site in Brixton to new premises in what was then a rural location at Ealing. In order to raise further capital, the company was refloated and now called the Autotype Fine Art Company Limited.

During the next few years, the company underwent a period of rapid expansion and diversification. In 1871 a photo-collographic printing department was added to the Ealing factory under the management of J.R.M. Sawyer and W.S. Bird. It also acquired the expertise of J.A. Spencer by amalgamating with his independent carbon printing business. Other rival concerns were acquired in similar fashion, A further reorganisation took place in 1873 when Spencer, Sawyer and Bird, purchased all patents, property and stock to form a new firm, Spencer, Sawyer, Bird and Co. The Autotype Fine Art Company continued as a separate concern dealing with the fine art business until the end of 1875 when it was purchased by Spencer, Sawyer, Bird and Co. The new joint concern now became simply The Autotype Company.

By the latter half of the 1870s, the Autotype Fine Art Company had become a prosperous and thriving concern with world wide interests. It was rapidly gaining a reputation for high quality carbon print reproductions of fine art and photographs. In the sixth edition of his manual, *The Autotype Process* (1877), Sawyer claims that the publication forms the basis of manuals in five languages and that galleries throughout Europe as well as "…our own splendid collections at the British and South Kensington Museums have yielded copies of their pictures." Advertisements at the back of the book give further insights into the market for Autotype reproductions. The company's catalogue included copies of works by Reynolds, Turner and Michael Angelo. Also listed is "A Splendid Series of Mrs Julia Cameron's Art Photographs." The body of the manual contains detailed instructions for working the Autotype process. There is also a note stating that instructions " will be given at the Autotype Works by previous appointment only, Tuesdays, Wednesdays and Thursdays in each week."

Towards the end of the century, Autotype broadened its interests further. It moved into the general photographic supply market, selling collodion for wet plates and later its own brand of gelatine dry plates. More importantly, it found a new market for the pigment paper. This was an essential component of photogravure, a new means of producing book and periodical illustrations that was being perfected and commercially exploited. The Autotype Fine Art Company was one of the first firms to experiment with the process and called their version 'autogravure.' They provided illustrations for books, including plates for Peter Henry Emerson's *Pictures of East Anglian Life*, but soon found it more profitable to concentrate on supplying pigment paper to what was a rapidly growing branch of the printing industry. By 1930, production of photogravure pigment paper represented about 75% of the company's manufacture.

In 1919 Autotype purchased the rights to H.E. Farmer's Carbro process, carbon prints made directly from bromide prints. Autotype simplified the process and began promoting it commercially in 1921. It became popular during the 1920s and 1930s, particularly in the form of trichrome carbro printing, a means of producing fine colour prints. Autotype supplied materials and instructions for the process until it was displaced by tri-pack colour film.

The 1950s saw Autotype finally abandoning carbon printing. The company's main business now centred around supplying materials to the thriving photogravure companies and also the rapidly growing market of screen printing. Autotype had entered the latter business in the 1920s, manufacturing a special pigment paper for the trade. From1958 to 1963 it also successfully marketed its own carbon based photo-stencil process. By 1976 the company had outgrown the Ealing factory and moved to a new site at Wantage, Oxfordshire. The company underwent another minor title change and became Autotype International Limited. At the beginning of the 21st century, Autotype International is a global company. It has moved into digital printing applications and now provides materials for touch screens, LCD displays and control panels.

JOHN WARD

See Also: Carbon Print; Cameron, Julia Margaret; Photogravure; Emerson, Peter Henry.

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B

BABBITT, PLATT D. (1823–1879)
American photographer

Equal parts artist and entrepreneur, Platt Babbitt made memorable photographs in a frontier region of young America. For several years, he worked a commanding vantage, selling to tourists daguerreotypes he made of them as they experienced brink of Niagara Falls. Information about Babbitt—and a good bit of his legendary appeal—was influenced by accounts written more than 30 years after the facts by John Werge, a traveling photographer and teacher from Scotland, who sold accoutrements for the early photographic processes and later wrote about his exploits in a book copiously entitled, *The Evolution of Photography with a Chronological Record of Discoveries, Inventions, Etc., Contributions to Photographic Literature and Personal Reminiscences Extending over Forty Years.* Werge may have overstated Babbitt's "monopoly" over photographs of the Falls, where he was said to have taken daguerrean exposures of visitors "without their knowledge," but he was fully accurate in identifying Babbitt as a "speciman of American character."

Born and raised in Lanesboro, Massachusetts in a Berkshire farming family, Babbitt caught the national impulse for westward migration, and followed the Mohawk Trail toward the great Niagara, the giant cascade that had captured the imagination of a young American republic with its power and subliminity. The Erie Canal, which paralleled the age-old byway of native people, had opened in 1825, facilitating travel and tourism, and Niagara Falls was a commanding destination. The small village at the Falls became a far larger, as all sorts of cash opportunities opened along the banks of the Niagara. Vendors hawked access to special points of view from which to consider the Falls, guidebooks, and trinkets, including daguerreotype likenesses, displayed in cases and in jewelry. Platt Babbitt's name first appear in Niagara regional press advertisements in 1850, first on the Canadian side, in partnership with photographer and concessionaire Saul Davis, who was known for his aggressive sales tactics, and later, by 1853, on the American side, sometimes in partnership with a store owners, such as with Thomas Tugby, owner of Tugby's Mammoth Bazaar, located several hundred feet from the location that Babbitt used to make his images.

By 1853, Babbitt had leased property to create a pagoda to hold his camera set up, established with a view toward the lip of the American Falls. It was a dramatic site, where visitors could feel the huge roar of the falls and enjoy the gentle mist that filled the air. Babbitt set up his daguerreotype apparatus such that it also allowed exposure of scenic Goat Island, Terrapin Tower and the Canadian Horseshoe Falls in the background, along with the likeness of tourists in the near ground, standing on the rocks at the edge of the river. Babbitt then is among the first to make a photograph to enhance a tourist's experience, and he is among the first to work the taking of photographs within the landscape.

The likelihood that tourists were unaware that Babbitt was exposing a daguerreotype plate of them is remote, however, given the prominence of Babbitt's pagoda and the advertising of his studio, located in the second floor of the building that provided entrance to an incline car, also at Prospect Point. The incline elevator permitted passage down the precipice to the ferry at the base of the falls. All of this attention should have attacted even the most awe-filled visitor, who would unlikely maintain the pose and stillness that Babbitt's images evidence. Indeed, Babbitt was an intrepid business man, using every device to attract business, shifting into different media as it was called for by the advances of the period. He also was a skilled image-maker; his full plate daguerreotypes (6½ × 8½ inches) are uniformly well

exposed, with remarkable depth of field and tonal range. His compositions of the various sites from which to view the Falls display creative points of view and framing. Thus, it seems particularly unlikely that he would leave the arrangement of his visitors at Prospect Point, and the expense of his exposures, to chance.

Babbitt was a versatile photographer, a man who seized opportunity to make a saleable image. His work as a documentarian—as an early photojournalist, even —rarely receives notice today. But in 1853, Babbitt created one of the most gripping of any early photographs. In that year, a man named Joseph Avery was boating above the Falls with a friend, when their boat was overtaken by the current, and capsized. Avery clung to a log that had lodged against a rock in the rapids. His friend was swept over the brink to his death. It was a bright day, and Babbitt had the time to move his camera to water's edge, where he made an image of the helpless Avery clinging to the log in the water, moments before his death. Attempts to save the man failed, and he, too, was carried across the brink. Niagara was a place for disasters, and for daredevils, and during his career, Babbitt documented these events, as well as those who came to visit.

Babbitt was not the first to document the Falls and its visitors. M.H.L. Pattinson, an English daguerreotypist who documented Niagara in 1841 for Noel Marie Paymal Lerebours, publisher of *Excursions Daguerriennes vues et monuments les plus remarqualles du globe*, was the first, followed by several others in the 1840s, notably including Frederick and William Langenheim of Philadelphia. But Babbitt was the first resident photographer on the American side, and he knew the Falls in its changing, annual faces, most spectacularly in the winter, when few tourists braved the challenging Western New York weather. His views all along the banks of the river, and his views from the base of the falls and the Cave of the Winds behind the falls, are spectacular, technically skilled and artfully handled, at first as daguerreotypes in full, half and quarter plates, later in dagurrean stereo views and glass plate colloidon stereo, window transparencies, and paper stereo prints.

Babbitt led a hard-scramble life in what amounted to a frontier town. His photography attracted attention through the 1850s, but late in that decade, the public record shows, his work became more of a struggle. He felt called on to defend his territory on Prospect Point from encroachment by other photographers, and he would disrupt their exposures with men waving open umbrellas in front of their cameras. And he fought with his landlord in a public brawl that attracted newspaper attention. During the 1860s, he dropped away from public view.

In 1873, a story in the local paper announces his return from "several years of retirement," with an offering a new glass transparency views of Niagara. And then in 1879, another story in the local press, reports his suicide, after a period of poor health, suffering from weakness and fainting spells. His death is marked by irony, for a man as skilled as he in negotiating the dangerous shores of Niagara, was found with a rock tied around his neck, face down in a creek of three-feet of water in a small town south of Buffalo.

Chiefly remembered for his setup exposures of tourists at the edge of the Falls, Babbitt is represented principally by this image in most museum collections and histories of photography. His work as a landscape photographer and documentarian is equally fine, and increasing attention has been given to this work, notably in Frank Henry Goodyear's *Constructing a National Landscape: Photography and Tourism in Nineteenth Century America,* a dissertation for doctor of philosophy at the University of Texas at Austin, 1998, and the author's *The Taking of Niagara: A History of the Falls in Photography,* 1982, Media Study/Buffalo.

ANTHONY BANNON

See Also: Werge, John; and Daguerreotype.

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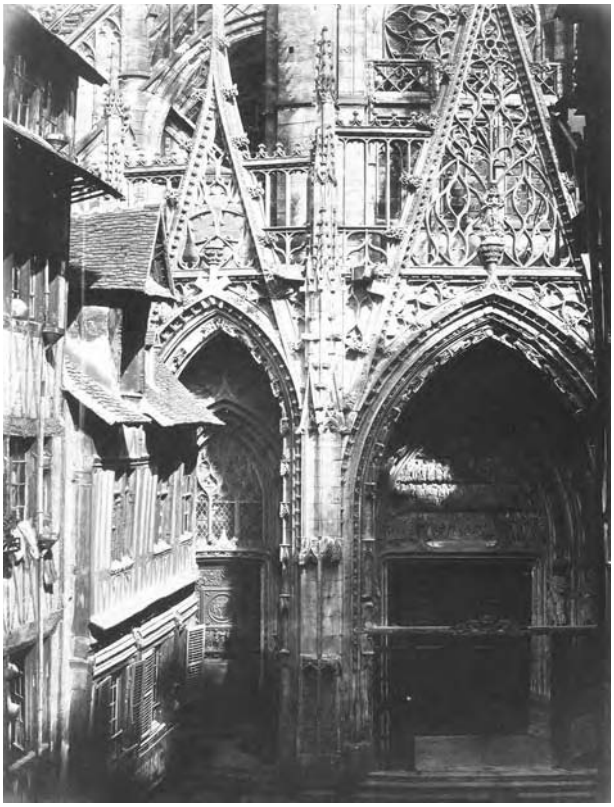
BACOT, EDMOND (1814–1875)

A painting student of Paul Delaroche, Edmond Auguste Alfred Bacot took up daguerreotypye by 1846 (although no examples survive) and paper photography by 1850. His largest and most impressive photographs, made with glass negatives between 1852 and 1854, depict historic monuments in his hometown, Caen, and in Rouen, Bayeux, and other sites in Normandy. With their focus on Gothic architecture and deep swaths of shadow, photographs such as *Saint Maclou, Rouen* rival the work of Bacot's Parisian counterparts and evoke the romantic spirit of Victor Hugo's writings and drawings. A Republican sympathizer and supporter, Bacot visited Hugo in exile on nearby Jersey in December 1852 and provided photographic instruction to his son Charles Hugo in Caen in March 1853. An album of 28 lavishly presented photographs by Bacot (Metropolitan Museum of Art, New York) likely consists of the prints sent to Hugo and much admired by the writer and his son. Six architectural photographs also appear in an album assembled by Bacot's fellow Norman gentleman-amateur, Louis Alphonse de Bisson (Musée d'Orsay, Paris). More widely distributed were Bacot's formal portraits of Vic-



Bacot, Edmond. Saint-Maclou, Rouen.
The Metropolitan Museum of Art, Harris Brisbane Dick Fund, 1995 (1995.96.10) Image © The Metropolitan Museum of Art.

tor Hugo taken in 1862, on which occasion Bacot also executed a series of stereoscopic views of the exiled writer's Guernsey residence, Hauteville House.

MALCOLM DANIEL

BAKER AND CO, F. W. (active 1850s–1860s)

A prolific commercial photographer in Northern India from the mid-1850s until the end of the 1860s, Baker appears to have arrived in Calcutta in around 1855, as an employee of the millinery firm of Appleton and Co. He was also, however, concurrently managing the daguerreotype studio of James William Newland and in August 1857, on his return from a photographic tour of the North West Provinces, he established his own business in Calcutta under the title of Baker's Daguerrean Rooms. The studio flourished throughout the 1860s, in due course changing its name to the Calcutta Photographic Company. While Baker produced the standard commercial fare of portraits and topographical views for the European market, the studio's most historically significant work remains its extensive documentation of the devastating cyclone which struck Calcutta in 1864. Baker appears to have abandoned photography completely in 1869, when his negative stock was sold to the firm of Saché and Westfield, returning to his early trade as a milliner in the partnership of Baker and Catliff. Between 1887 and 1896 he was resident in Rangoon and although his date of death or departure from India has not been established, he appears to have still been living in Calcutta as late as 1908.

JOHN FALCONER

BALDI, GREGOR (1814–1878) AND WÜRTHLE, KARL FRIEDRICH (1820–1902)

Born in Telve, South-Tirol, Austria, Gregor Baldi started work as an arts and crafts dealer in his brothers shop in Linz, Upper-Austria at the age of 15. From c. 1842–1861 he had his own successful art-shop in Salzburg. He edited nine albums with steel-engravings of topographic studies, some made by Karl Friedrich Würthle, born Konstanz, Germany.

In January 1862 they established Baldi & Würthle in a purpose-built studio in Riedenburg Nr. 17, a suburb of Salzburg.

In 1866 the studio was moved to Schwarzstraße near the theatre. They made studio-portraits and groups in albumen and later gelatine. But the most numerous subjects were hundreds of location photographs of Salzburg-town and landscape and mountain-photos of country areas in Salzburg and his neighbourhood, now housed in the Salzburger Museum Carolino Augusteum. These photos were produced in a range of sizes from carte-de-visite to 370 × 570 mm, and, from 1866, panoramas (230 × 530 mm).

From 1874 they operated separate studios, with Würthle moving to Schwarzstraße 11. From 1875 to 1880 Würthle alone was the owner of the studio of which the name remained 'Baldi & Würthle.' From 1881 to 1892 the atelier 'Würthle & Spinnhirn' belonged to Würthle and his brother-in-law Hermann Spinnhirn, a chemist.

From 1892 to 1904 the studio name was 'Würthle & Son,' out of which they photographed and published images.

'Baldi & Würthle' and their successors were the first fully professional, important and well known photographers in the capital town of Salzburg and other western countries of the Austrian empire and remained so until about 1900.

ERHARD KOPPENSTEINER

BALDUS, ÉDOUARD (1813–1889)

French photographer

Édouard Baldus arrived in Paris to study painting in 1838 at the age of twenty-five, shortly before the first public announcement of photography's invention. He

was a native of the small German town of Grünebach, forty-five miles east of Cologne, and, according to some reports, had first embarked on a career as an artillery officer in the Prussian army before becoming a painter in the early 1830s. He is said to have exhibited his paintings with some success in Antwerp and to have traveled throughout America as an itinerant portrait painter, but neither statement can be confirmed by surviving evidence. In Paris, Baldus worked outside the École des Beaux-Arts and atelier system; he submitted work to each of the annual *salons* from 1841 to 1851 but achieved little success and received no critical mention as a painter. In the decade that followed, Baldus abandoned the easel and took up the camera, rose to the top of his new profession, won international critical acclaim, secured commissions from governmental ministries and captains of industry, and created photographs now considered masterpieces of art.

Baldus first experimented with photography in the late 1840s, although no surviving prints can be definitively dated prior to 1851, the year in which he, Gustave Le Gray, Henri Le Secq, Hippolyte Bayard, and O. Mestral were awarded *missions héliographiques*, photographic surveys of the nation's architectural patrimony carried out at the behest of the Commission des Monuments Historiques, a government agency. Baldus's *mission* took him to Fontainebleau, through Burgundy, the Dauphiné, Lyonnais, Provence, and a small section of Languedoc. According to an account published the following year (Baldus, Édouard, *Concours de Photographie,* Paris: Victor Masson, 1852), Baldus utilized his own variation of the paper negative process, which included a layer of gelatin to provide a smoother surface and finer rendition of detail. Although prints from the *mission héliographique* are rare, the majority of negatives from this campaign survive in the collection of the Musée d'Orsay, Paris. Extant prints and negatives show that Baldus occasionally overcame the limitations of scale, depth of field, and varying light conditions by piecing together a jigsaw puzzle of individual negatives to form a single large composition.

So impressive were Baldus *mission* pictures for their clarity, beauty, and size that he quickly won government support for a project entitled *Villes de France Photographées,* a series of architectural views of Paris and provincial cities that fed a resurgent interest in France's Roman and medieval past. After photographing the chief monuments of the capital in 1852, Baldus returned to the south of France in the autumn of 1853, accompanied by a student, Wilhelm von Herford (German, 1814–1866) and an assistant. There he photographed, for the *Villes de France* series and for his stock, many of the same monuments he had recorded in 1851 on negatives that he had subsequently been obliged to turn over to the government. His large-format (35 × 45 cm) negatives of 1853, however, show the Roman theater and triumphal arch at Orange, the church of St. Trophîme at Arles, the Tour Magne and Maison Carrée at Nîmes, and other monuments of Provence with an unprecedented directness that would establish the standard for architectural photography. Gone were the picturesque elements, figures, and anecdotal details present in his earlier photographs and traditionally considered necessary to animate topographic prints of the period.

The following summer Baldus coursed the dirt roads of the countryside by horse-drawn cart in the company of Fortuné-Joseph Petiot-Groffier (French, 1788–1855), moving from ruined castle to thatched hut, from pilgrimage church to paper mill, from town square to wooded chasm, through the fertile lowlands and rugged mountains of the Auvergne, in central France. In a departure from his earlier work, perhaps owing to the different physical character of this region, Baldus photographed not only medieval pilgrimage churches such as Brioude and Issoire, but also vernacular architecture and unpopulated landscape, adding a poetic force to the graphic power and documentary value of his earlier photographs.

By 1855, Baldus had established a reputation as the leading architectural photographer in France, and his pictures drew much public attention and critical notice at the 1855 Exposition Universelle in Paris. In August of that year Baron James de Rothschild—banker, industrialist, and president of the Northern Railway—commissioned Baldus to produce an album showing views along the rail route from Paris to Boulogne-sur-Mer. The lavish album, presented to Queen Victoria as a souvenir of her passage on the line during her state visit to Paris and still housed in the Royal Library at Windsor Castle, contains 50 beautifully composed and richly printed photographs of cathedrals, towns, railroad installations, and ports that are among Baldus's finest images.

Also in 1855, Baldus began photographing on the worksite of the New Louvre, documenting for the architect Hector Lefuel every piece of statuary and ornamentation made for the vast complex linking the Louvre and Tuileries palaces. As individual records these photographs served a practical function on the bustling worksite, keeping track of the many hundreds of plaster models and carved stones sculpted for the project. As a collected whole, however, they formed a new means of comprehending and communicating a complex subject, bit by bit, to be reconstituted by the mind. Only photography—precise, omnivorous, prolific, and rapid—and then only in the hands of an artist both sensitive and rigorous, could produce an archive as a new form of art. Of the several thousand images made at the Louvre during the period 1855–57, however, it is the large-format photographs of the principal pavilions

Baldus, Èdouard. Entrance to the Donzera Pass. *The Metropolitan Museum of Art, Gilman Collection, Gift of the Howard Gilman Foundation, 2005 (2005.100.364.20) Image © The Metropolitan Museum of Art.*

that are his most carefully crafted and clearly articulated demonstrations of photography's unparalleled capacity to represent architecture, fully exploiting the medium's ability to render the play of light, the volume of architectural forms, and the most intricate details. Baldus's photographs of the New Louvre were assembled in albums (four volumes in each set) and presented by the emperor to government ministers, the imperial family, and the reigning monarchs of Europe as New Year's gifts in 1858.

In June 1856, in the midst of his work at the Louvre, Baldus set out on a brief assignment, equally without precedent in photography, that was in many ways its opposite: to photograph the destruction caused by torrential rains and overflowing rivers in Lyon, Avignon, and Tarascon. From a world of magnificent man-made construction, he set out for territory devastated by natural disaster; from the task of recreating the whole of a building in a catalogue of its thousand parts, he turned to the challenge of evoking a thousand individual stories in a handful of transcendent images. Baldus created, in the words of Ernest Lacan, a "painfully eloquent" record of the flood without explicitly depicting the human suffering left in its wake. The "poor people, tears in their eyes, scavenging to find the objects most indispensable to their daily needs," described by the local *Courier de Lyon*, are all but absent from his photographs of the hard-hit Brotteaux quarter of Lyon, as if the destruction had been of biblical proportion, leaving behind only remnants of a destroyed civilization. In Avignon Baldus stood on the cathedral terrace from which, a few days earlier, Napoleon III had surveyed the floods, and pivoted his camera to compose a sweeping six-part panorama that encompasses the entire Rhône valley—the inundated island of Barthelasse, the town of Villeneuve-les-Avignon, and the river, slowly returning to the confines of its banks.

In the late 1850s, Baldus expanded his highly successful series of large-format views of historic monuments in both Paris and the provinces, and around 1860 he photographed the rough alpine regions of southeastern France. At the height of his success, he employed a dozen assistants and sold his work through a dozen merchants in Paris and through print and book dealers in Nîmes, Hamburg, Florence, Venice, Turin, Milan, Vienna, and London.

In the second of his two railway albums, commissioned in July 1861 by the Chemins de fer de Paris à Lyon et à la Méditerranée (PLM), Baldus again pioneered new aesthetic ground and drew from a decade's work to speak forcefully and eloquently about the relationship of history and progress. The album is a masterfully composed sequence of sixty-nine photographs of the landscape, towns, principal sites of interest, and railroad structures along the line from Lyon to Marseilles and Toulon. By interspersing boldly geometric images of the railroad tracks, stations, tunnels, and viaducts with his classic views of historic architecture—the ramparts of Avignon, the Maison Carrée, Saint-Trophîme, the Pont du Gard—Baldus presented Second Empire engineers

as the natural heirs to a great tradition of building that stretched back to Roman and medieval times. The final section of the album presents the natural beauty of the Côte d'Azur, including the majestic rock formations at La Ciotat. The concluding pair of images—the barren, rocky Ollioules Gorge and the iron and glass railroad station of Toulon—restates the album's central theme of progress, contrasting wilderness and civilization, nature and man. A dozen examples of the PLM album are currently known (three in an abridged form).

While the PLM album is a triumphal climax to the most fruitful period of Baldus's artistic career, more than half his professional life still lay ahead. During the next two decades, he increasingly shifted his energy from the production of ambitious and carefully crafted works of photographic art to the commercial and industrial applications of the medium. In part, personal factors account for this shift. In the years following the death of Baldus's wife Élisabeth in March 1858, her mother probably helped care for the couple's children; after his mother-in-law's death in April 1862, the responsibilities of fatherhood may have kept Baldus closer to home and his three teenage children, and prompted him to focus on Parisian views and on the publication of his work in gravure form. By 1869, when his daughters were married and his son had reached majority, Baldus was approaching sixty, and the labor and hardship that characterized the extended photographic excursions of his younger days may have seemed less appealing, less necessary, or less possible. External factors, however, were also at work: social and economic forces increasingly pushed photography toward ever-cheaper and more widely distributed images. In the early 1850s, few outside scientific, artistic, and aristocratic circles collected photographs, but by 1860 the carte-de-visite portrait and the stereo card, produced by the thousands and available at extremely low cost, had brought photography into the homes of a much broader public. It was surely in an attempt to market his work to the souvenir-seeking tourist and public that Baldus produced a series of 95 small-format views of Paris (approximately 20 × 30 cm) in the early-1860s, and even tried his hand at stereographic photography. In contrast to his large-format work of the previous decade, his smaller, glass-negative photographs of Paris and the provinces appear indifferently composed and printed.

Beginning in the mid-1860s and lasting until the early 1880s—in other words, for more than half his career as a photographer—Baldus's primary commercial activity centered on the production of photogravures, a process that he had first explored as early as 1854. Baldus's photogravure process (or "héliogravure," as he called it) triumphed equally as a photographic method of producing facsimile gravures and as a gravure method of printing photographic images. His first major publications in gravure form, issued from 1866 to 1869, all reproduced ornamental engravings by past masters—Heinrich Aldegrever, Hans Sebald Beham, Jacques Androuet Ducerceau, Albrecht Dürer, Hans Holbein, and Marcantonio Raimondi.

Baldus first published his own photographs in photogravure form in a three-volume publication on the architecture and ornamentation of the Louvre and Tuileries palaces that parallels his earlier photographic albums. *Palais du Louvre et des Tuileries: Motifs de Décorations… must have seemed ironically timely, for while it was still being issued the Tuileries Palace and parts of the Louvre were burned down in the destruction of the 1871 Commune.* Although he did not reveal the details of his process, nor enter the Duc de Luynes's competition, Baldus achieved results in photogravure that were unrivaled in their detail, smoothness of gradation, and richness.

Encouraged by the success of his volumes on the Louvre, he published a portfolio of one hundred photogravures reproducing elements of interior and exterior decoration of the Château de Versailles and of the Grand and Petit Trianons—garden vases, statuary, fountains, paneling, moldings, consoles, tables, and so forth, as well as six exterior architectural views. With his photogravure publication *Principaux Monuments de la France* in the early 1870s, Baldus came full circle, issuing in gravure form a series of architectural photographs much like his *Villes de France photographiées* of the early 1850s, and, in a few cases, utilizing the same negatives. Baldus's last known photographic activity was a publication in the same vein as his Louvre and Versailles volumes—a collection of one hundred photogravures of the architectural and sculptural decoration of the new Hôtel de Ville of Paris, built from 1882 to 1884 to replace the building burned down by the Commune a decade earlier.

Baldus's extensive publishing activity did not necessarily signal financial success. Perhaps having overextended himself in the production of *Hôtel de Ville* or perhaps the victim of other circumstances, Baldus transferred to his son-in-law more than seven hundred copper printing plates for the Louvre, Versailles, Hôtel de Ville, and Ducerceau gravures, and thousands of unsold prints from those publications as collateral for a small loan in October 1885, probably to protect the means of his livelihood from creditors; only fifteen months later, in January 1887, he filed for bankruptcy. Édouard Baldus died December 22, 1889, in Arcueil-Cachan, a suburb south of Paris.

The first major exhibition devoted to the photograph of Baldus was presented at The Metropolitan Museum of Art, New York, the Canadian Centre for Architecture, Montreal, and the Musée national des monuments français, Paris, in 1994 and 1995.

Although photographs by Baldus—especially the small-format albumen prints of the 1860s—are relatively common, richly printed, well preserved salted paper prints of his best work of the 1850s are indeed rare. Newly discovered prints—some of previously unknown images—have appeared steadily throughout the late 1980s, 1990s, and 2000s as the market for nineteenth-century photographs has matured. An important cache of exceptionally beautiful, unmounted salted paper prints from the mid-1850s was discovered in 1988-89 by the descendents of Léon Bourquelot, Baldus's contact in the office of the Architect of the Louvre.

The Musée d'Orsay, Paris, holds the most important collection of Baldus photographs including the negatives from his *mission héliographique* and 1856 flood series as well as many fine salted paper prints of his work from the 1850s. Other significant Baldus holdings in public institutions include: Médiathèque du Patrimoine, Paris, notably for *mission héliographique* prints; École des Beaux-Arts, Paris, and École Nationale des Ponts et Chaussées, Paris, both of which collected Baldus's work in the nineteenth century for their students' edification; Canadian Centre for Architecture, Montreal; J. Paul Getty Museum, Los Angeles, including two copies of the PLM album; The Metropolitan Museum of Art, New York; and Gilman Paper Company Collection, New York.

MALCOLM DANIEL

Biography

The second of eight children and the eldest son of Johann Peter Baldus and Elisabeth Weber, Eduard was born in Grünebach, Prussia, on June 5, 1813. Little is known about the first twenty-five years of his life. He moved to Paris in 1838 to study painting and changed the spelling of his name to "Édouard" (he has often been referred to erroneously as "Édouard-Denis"). In September 1845 he married a French woman ten years his junior, Élisabeth-Caroline Étienne, and within four years was the father of two daughters and a son. He was naturalized a French citizen in June 1856 and was awarded the Legion d'honneur in August 1860.

Baldus began photographing in 1848, and was a founding member of the Société héliographique in 1851, the year in which he received a *mission héliographique* to photograph historic monuments, principally in Provence. The following year he began a critically acclaimed and commercially successful series of large-format photographs that continued for more than a decade; his principal subjects included architectural monuments of Paris and the French provinces, particularly Provence (1852–61); landscapes of the Auvergne (1854) and southeastern France (1860–61); railroad and civil engineering works, particularly along the routes of the Northern and Paris-Lyon-Méditerranée lines (1855–62); the construction of the New Louvre (1855–58); and the Rhône River floods (1856). From 1866 to 1884 the majority of his efforts were devoted to the publication of photogravures. He filed for bankruptcy in January 1887 and died December 22, 1889, in Arcueil-Cachan, a suburb south of Paris, where he is buried in the local cemetery.

Baldus's work was sold by at least two dozen book and/or print sellers in Paris and throughout Europe. He participated in many exhibitions, including the following: Photographic Society of London, 1854; Tentoonstelling van Photographie en Heliographie gehouden door de Vereeniging voor Volksvlijt, Amsterdam, 1855; Exposition Universelle, Paris, 1855; 1st Annual Exhibition of the Photographic Society of Scotland, Edinburgh, 1856; Photographic Society of London, 1856; Manchester Photographic Society, Exhibition of Photographs at the Mechanics' Institution, 1856; Exposition Instituté par l'Association pour l'Encouragement et le Développement des Arts Industriels en Belgique, Brussells, 1856; Deuxième Exposition Annuelle, Société Française de Photographie, 1857; Exposition Instituté par l'Association pour l'Encouragement et le Développement des Arts Industriels en Belgique, Brussells, 1857; Architectural Photographic Association, London, 1858; Photographic Society of London, Fifth Year, 1858; Architectural Photographic Association, Second Annual Exhibition, London, 1858–59; Troisième Exposition de la Société Française de Photographie, 1859; Exhibition of photographs, Aberdeen, 1859; Architectural Photographic Association, Third Annual Exhibition, London, 1860; Exposition Photographique d'Amsterdam, 1860; Architectural Photographic Association, Fourth Annual Exhibition of English and Foreign Photographs, London, 1861; Quatrième Exposition de la Société Française de Photographie, 1861; Exposition de la Société Photographique de Marseille, 1861; Universal Exhibition, London, 1862; Exposition Universelle, Paris, 1867; Huitième Exposition de la Société Française de Photographie, 1869; Exposition de la Société Photographique de Marseille, 1871; Welt-Ausstellung, Vienna, 1873; Dixième Exposition de la Société Française de Photographie, 1874.

Baldus's publications included: *Concours de Photographie* (1852); *Vitraux de l'Église Sainte-Clotilde* (1853); *Réunion des Tuileries au Louvre* (1857); *Recueil d'Ornements* (1866); *Oeuvre de Marc-Antoine Raimondi* (1867); *Oeuvre de Jacques Androuet dit Du Cerceau* (ca. 1969); *Palais du Louvre et des Tuileries* (1869–71); *Palais de Versailles* (early 1870s); *Les Principaux Monuments de la France* (early 1870s); *Reconstruction de l'Hôtel de Ville de Paris* (1884).

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BALL, JAMES PRESLEY (1825–1905)

One of the country's first African American photographers, James Presley Ball learned his craft in 1844–5 from fellow African American John B Bailey, before opening his first studio in Cincinnati in 1845.

Ball was born in Virginia, a free man, and went on to become a significant figure in both photography and the abolitionist movement in America.

A brief move to Richmond, Virginia, in 1846 brought some success and, but he was back in Cincinnati from 1847 and "Ball's Great Daguerrean Gallery of the West" was established at 28 West 4th Street. With his brother Thomas running the studio, Ball became an itinerant photographer for a period travelling in both America and Europe. Alexander Thomas joined him in Cincinnati from 1852, becoming his partner before 1859, and by 1854 he was recorded as employing nine people.

With his studio established and his reputation and wealth growing, Ball turned his attention to the plight of slaves, publishing a pamphlet on the subject in 1855, and mounting panoramic exhibitions in his gallery to highlight the evils of slavery.

A tornado destroyed the gallery in May 1860, but it was rebuilt, and his partnership with Thomas continued the 1870s, by which time his son, James Presley Ball Jr. also a photographer, had been taken into partnership with him as well.

The studio moved to Minneapolis and St Paul (mid 1870s) and Helena, Montanta (1887), and eventually Seattle (1900) followed—where he operated as the Globe Photographic Studio, and where he died in 1905.

JOHN HANNAVY

BAMBRIDGE, WILLIAM (1819–1879)

British photographer

As a young man William Bambridge travelled with the 1841 mission of Bishop Selwyn to New Zealand, which had recently come under British sovereignty. There Bambridge was employed as a teacher and clerical assistant. He became an accomplished colonial artist and made many drawings of native Maoris and Europeans. Bambridge returned to his home town of Windsor in 1848 and is known to have been working for the Royal Family at Windsor Castle from 1854.

Bambridge appears to have started work in the Royal Household with the role of photographic manager; printing and cataloging negatives from the many commissioned 'Royal' photographers, including Roger Fenton.

In 1857 he printed Fenton's large negatives, taken at Balmoral (the Queen's Scottish estate). That same year he was kept busy printing many of the Queen's other negatives; just between July and September 1857 he made nearly 2000 prints and that year's bill for his photographic services was the then large sum of £640.

As well as printing other photographers' work Bambridge took many pictures himself. Living locally he was on hand to record the royal pets and farm animals and to make informal family portraits. He exhibited his pictures of animals, including cattle, dogs and deer at the Photographic Society between 1855–57. He also was involved in copying many of the Royal Collection's art works, including the Raphael Cartoons.

In the early 1860's Bambridge collaborated with the keen amateur photographer James Sinclair, fourteenth Earl of Caithness (1821–1881), to produce a book of tree studies, taken in the nearby Royal Parks. *The History of Windsor Great Park and Windsor Forest.* Longman, Roberts, Green and Co. (1865) comprised 20 studies of ancient trees. The photographs were probably taken by Caithness, with the assistance of Bambridge, who also made the 10 × 12 inch albumen prints.

Bambridge retired from photography in 1874 and was granted a Royal Pension for his 20 years' service.

IAN SUMNER

BARKANOV, V.V.

Professional photographer

V.V. Barkanov was one of the first Georgian photographers. His full name, date of birth and death are unknown. He began working as a professional photographer in 1869 in the town of Kutaisi, later moving to Tiflis (today Tbilisi) to work there. He made studio portraits but it was his collection of "Views and Types"

that made him famous. His photographs illustrate folk musicians, noble ladies of the Caucasus in national costumes, coal-sellers and numerous other types of people.

Barkanov also made trips to various regions of the Caucasus with his mobile studio often photographing individuals that interested him. His contemporaries praised his work for the scientific techniques, and today, the high artistic quality of his work is also discussed.

Barkanov's works were awarded medals at the Polytechnic exhibition in Moscow in 1872, the World exhibition in Vienna in 1873 and in Paris in 1874. Barkanov was also awarded the title of "Court Photographer of His Highness, Prince Mikchail Nikolajevich." In 1877 and 1878, Barkanov worked as photographer in the army during the Russian-Turkish war. In the 1880s he sold his photo-studio, and in 1881 he received a diploma at an exhibition in Toulouse.

Throughout his career, Barkanov made huge contributions to the development of ethnographic photography in Russia.

ALEXEI LOGINOV

BARKER, ALFRED CHARLES (1819–1873)

English photographer

Dr. Alfred Charles Barker (1819–1873) arrived in New Zealand in 1850 as part of a successful venture which saw the establish of a new English immigration scheme establish in the South Island. His role as a doctor in Christchurch was cut short by a fall from a horse. He then turned his attention to land purchases and other investments which helped to found his family¹s fortunes. In 1858 he took lessons in photography from the architect Benjamin Mountfort and became proficient in the collodion process. For subject matter, he photographed his family in their environment on the Canterbury Plains, producing prints from his negatives which he distributed to friends and relations both at at home and abroad. Today these are treasured because of their significance in documenting the life and times an Englishman in a new land. Most of these historically important social statements were made in his Œgarden studio. As well he also distinguished himself with forays into stereoscopy and recording important civic events. In comparison to other colonial amateurs, Barker seemed to care little for formalities when it came to obeying the rules of pictorial composition and formal portraiture. Despite his apparent disregard for photographic protocol, his work displays a directness and vitality all of its own.

WILLIAM MAIN

Barker, George. Niagara Falls.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

BARKER, GEORGE (1844–1894)

The Canadian photographer George Barker was born in London, Ontario, in 1844, opening a photographic studio in that city at the age of eighteen. He is believed to have been trained in photography in the late 1850s by James Egan.

By 1863 Barker had moved to Niagara Falls, New York, where he worked for Platt D. Babbitt, who had operated a studio there since 1853.

Barker later established studios in both Niagara and London, Ontario, and by the late 1860s his catalogue of views—both large format and stereographs—was extensive. A fire destroyed his premises on 7th February 1870, but as the *Philadelphia Photographer* reported, his unique catalogue of stereoscopic negatives was rescued. By the late 1880s, his stereo views of the Falls were mounted on cards bearing the legend 'George Barker, Photographer, Eleven First Prize Medals, Stichmeyer & Wyman Publishers,' and the titles were printed on the reverse side in six languages.

Barker's work was used—as tipped-in heliotypes—to illustrate James T. Gardner's *Special Report of the New York State Survey of the preservation of the Scenery of Niagara Falls, and Fourth Annual Report of the Triangulation of the State* published in 1880, and in reporting his death in 1894 the photographic press described him as 'the eminent photographer of Niagara Falls.'

After his death his negatives were acquired by Underwood & Underwood.

JOHN HANNAVY

BARNARD, EDWARD EMERSON (1857–1923)

American astronomer, celestial photography pioneer, and a prolific writer and publisher of over nine hundred scientific papers

Barnard only received two months schooling in his early years, as his mother taught him from home. His father died before he was born, so at the age of nine, he started work in a photography gallery. He was put in charge of a solar enlarger, which was used to track the sun and make photographic prints. Barnard went on to privately study, photograph and discover comets, nebulae and planets. His photographic atlas of the Milky Way is of such accurate detail and quality, that it is still used to date. His drive to discover new comets was rewarded by a wealthy patron of astronomy, Mr H.H.Warner, who rewarded each comet's discovery with $200. In 1883 he received a Fellowship to Vanderbilt and graduated in Mathematics in 1887. From 1887–1895 he worked as an astronomer at Lick Observatory in California. In 1892 he discovered the first comet photographically and discovered the fifth moon of Jupiter, Amalthea. As the first four moons had been discovered by Galileo in 1610, and none since, this catapulted him into being an astronomy celebrity. From 1895 onwards he was a Professor of Practical Astronomy at Chicago's University and an astronomer at Yerkes Observatory. His work received distinguished recognition by the Royal Astronomical Society in Great Britain and a Gold Medal in 1897. He was also recognised by the Academy of Sciences in France.

JO HALLINGTON

BARNARD, GEORGE N. (1819–1902)

Born in Connecticut, American photographer George N. Barnard is best known for his views of the American Civil War, published in Alexander Gardner's *Gardner's Photographic Sketchbook of the War* (1866), in Barnard's own *Photographic Views of Sherman's Campaign* (1866), and widely-circulated in engraved form in *Harper's Weekly*. Barnard's photographs are an indispensable chronicle of the destruction wrecked and losses suffered in the Civil War.

Barnard appears to have made his first photographs around 1842. The following year, at the age of twenty-four, he opened a daguerreotype studio in Oswego, New York. Among Barnard's earliest surviving works are two views of a fire at the Ames Mills in Oswego ("Burning Mills at Oswego, NY," 5 July 1853). They stand as remarkably early examples of daguerreotype reportage. In the same year, Barnard became secretary of the New York Daguerrean Association. After purchasing Clark's Gallery in Syracuse, he began making ambrotypes. At some point in the late 1850s, he studied and adopted the wet-collodion negative process, then rapidly increasing in popularity.

In the years before the American Civil War, Barnard

Barnard, George. Ruins in Columbia, S.C. No 2. *The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.*

appears to have ventured widely while pursuing his craft, even making photographs in Cuba in 1860. Unfortunately, none of these works have been located. Shortly before the outbreak of the Civil War, Barnard was either employed directly by Matthew Brady or working as an independent contractor for him in New York, and, possibly, in Washington, D.C. During this period, Barnard made photographs of President Abraham Lincoln's inauguration.

With the advent of hostilities, Barnard entered into a partnership with photographer John Gibson. Together, they made and copyrighted photographs of Centerville and the Bull Run Battlefield (the site of the first major land battle of the Civil War) in March of 1862. These images were published by Matthew Brady as "Incidences of War," and later published by Andrew Gardner in his *Sketchbook* (see, for example "Ruins of Stone Bridge, Bull Run," 1862, published in *Sketchbook*, vol. 1, pl. 7). In 1862 Barnard briefly returned to his native New York, and made portrait photographs at Gray's Gallery in Oswego.

In 1864 and 1865 Barnard worked as an independent photographer for Orlando Poe, Chief Engineer of the Military Division of the Mississippi in Nashville, Tennessee. indwas official Army photographer in the Chief Engineer's Office, Division of Mississippi. Barnard does not seem to have received a received a military commission, unlike his contemporary, photographer A. J. Russell, who was a captain in the U.S. Army and official photographer for the United States Military Railroad. Barnard's photographs of Civil War battlefields in the Deep South and his coverage of Union General William Tecumpseh Sherman's western campaign were published to wide attention in *Harper's Weekly*.

After the conclusion of the war, Alexander Gardner credited to Barnard 8 of the 100 wet-collodion negatives (singly or jointly) printed for his two-volume *Gardner's Photographic Sketchbook of the War* (1866). Many of Barnard's negatives were wrongly credited to Brady. Perhaps in response to the wide circulation of his images under his Brady and Gardner's names, in the same year, Barnard published to wide notice his own *Photographic Views of Sherman's Campaign*, though circulations was limited, owing in no small part to the expense of the folio ($100).

After the war, Barnard returned to his native upstate New York, settling in Syracuse around 1866. He is also known to have operated a photographic studio in Charleston, SC. While there, he produced and published a series of stereographs of African American street vendors. Between 1869 and 1871 Barnard ran a studio in Chicago and photographed the aftermath of the Great Fire (1871). In 1883, he returned to New York and promoted the gelatin dry plate for George Eastman of Rochester. Barnard operated his last studio in Plainsville, Ohio (1884-86), after which, at the age of sixty-seven, he appears to have retired from the business of making photographs. Barnard died in 1902 at the age of eighty-three.

Bryan Clark Green

See Also: Wet Collodion Negative; and Brady, Mathew B.

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BARNARDO, THOMAS JOHN (1845–1905)

Irish patron and businessman

Thomas John Barnardo was born in Dublin on 4 July 1845. In 1866 he studied at the London Hospital, preparing to become a medical missionary in China. He began mission work among the poor of Stepney, east London, and started his own Ragged School to teach homeless children. Barnardo opened his first boarding home in Stepney in 1871. By the time he died in London in 1905 almost 8,000 children were in residential care, over 4,000 were boarded out, and 18,000 had been sent to Canada and Australia.

From 1870 Barnardo used various commercial firms to take 'before' and 'after' photographs showing how wretched the children looked on arrival and how they looked after they had been trained to work in the home's workshops. In 1874 Barnardo opened his own Photographic Department to help record the personal history of every child. Most of the photographs were taken by

commercial photographers Thomas Barnes and his son (up to about 1888) and Roderick Johnstone from 1883. Barnardo also sold photographs on cards, reproduced them in pamphlets and in his house journal, *Night and Day*. By 1905, the Department had taken over 55,000 pictures, many of which still survive at Barnardo's.

JOHN TAYLOR

BARNETT, WALTER H. (1862–1934)

Australian portrait photographer

Henry Walter Barnett was born in Melbourne, Australia, on 25th January 1862, his parents having moved there from London probably in the late 1840s. In 1875, only 13 years old, he left school and joined the most successful photographic studio in Melbourne, Stewart and Co. This business had started some 12 years before and had grown very rapidly. The business was clearly a gold mine, but the resulting product was standardised, lacking distinction. "I have never seen a print of Stewart's worth a second glance," wrote one of Barnett's later protégé's, Jack Cato (Cato, *Story*, 88).

It was here that Barnett first met the young Australian artist, Tom Roberts, who joined the firm in 1877. This was the start of an artistic relationship that was to extend over fifty years. Roberts was to become recognised as "the father of Australian landscape painting."

In 1880, Barnett moved to Hobart, Tasmania, to set up his first commercial venture, a studio he owned together with Harold Riise. He stayed for two years, and then, recognising that he needed wider experience and new ideas if he was to make his mark, he took the bold step of travelling around the world, working as he went for leading photographers of the day: in San Francisco (I. W. Taber), then Chicago (Joseph W. Gehrig), then New York, and finally London, where he was on the staff of the court photographer, W. and D. Downey. Barnett was operator at sittings of the Prince of Wales (later Edward VII), "and dukes and duchesses and titles galore," according to Cato. (Cato, *Story*, 90).

By this time, Barnett had wider skills than any portrait photographer in Australia, and in 1885 he returned home, to Sydney, and opened Falk Studios, which quickly gained a reputation as the best of its kind in the city. Barnett's rise to the top was driven by two main factors: he pioneered in Australia a new look in portrait photography, and he displayed masterly skills in marketing and public relations.

His new look enabled him to present his sitters with a paradoxical mix of glamour and realism. Before his arrival on the scene, Australian photographers had gone for a bright, flat lighting system, giving the sitters a white, shell-like appearance. Barnett introduced dramatic side-lights, emphasising bone structure and enabling his sitters' individual personalities to shine through. As Jack Cato noted: "Walter Barnett in Sydney was discarding retouching altogether for men. He was the first to deliberately photograph the course, deep-toned texture of the skin; to show the bone structure of the skull, to get the sculpturesque modelling of the human head" (Cato, *Story*, 91). Other studios usually took just one position of each sitter, sometimes two. Barnett used up to a dozen different positions, and for a really major celebrity he might take fifty.

Barnett's relationships with an extended group of Australian artists were formed around this time, amongst them Arthur Streeton. Streeton was impressed by the photographer and his work: "He is and very artistic and has good appreciation for the beautiful" (Streeton to Roberts, April 1890).

A major strand of his work at this time was actors and actresses. With major visiting celebrities, Barnett typically negotiated exclusive rights to photograph them and to market their pictures to an eager public. Amongst these was the great French actress, Sarah Bernhardt (1891). So successful was his work for her that for many years she continued to order copies from whatever part of the world she happened to be performing in.

High society in Sydney flocked to Barnett's studio, including leading politicians. His 1892 portrait of the premier of New South Wales, Sir Henry Parkes, is one of his most memorable images. Other important sitters included the writers Robert Louis Stevenson (1893), Mark Twain (1896) and Banjo Patterson (c 1895)—who wrote the original poem, "Waltzing Matilda."

In 1895, Barnett opened a new studio in Melbourne, but it was around this time that he conceived the notion of returning to try his luck in London. On a return trip from there in 1896, he met in Bombay a young Frenchman, Marius Sestier. A cameraman for the pioneering movie film company, Lumiere, Sestier's Indian film had not developed properly. Barnett proposed that he come to Sydney—and this he did, leading to the first movie film to be shot and developed in Australia.

Moving decisively to London in 1897, Barnett opened a studio in Knightsbridge, quickly establishing himself as one of the leading portrait photographers. In 1899, he was invited to join the influential photo-secessionist group, The Linked Ring. Two years later he became a founder member of the Professional Photographers Association, becoming a vice president shortly thereafter, and by 1903 he had become the only professional to be elected to the council of the Royal Photographic Society. Barnett's artistic goals in his early days in London were clear: "I have long been conscious of the deficiencies of portrait photography. Being an enthusiastic admirer of English mezzotint... it seemed to me that it might not be impossible to make photography a humble follower" (*Photography*, 22nd June 1899). A collection of his early

London work, mixed in with the best from Sydney, was to win an important prize in his first year there.

In London over the next two decades, Barnett continued to photograph high-society, writers, artists and musicians. The French sculptor, Auguste Rodin, sat for him in 1903, the great opera singer, Dame Nellie Melba, the year before.

During the First World War, Barnett changed towards a more modern style. In 1920, he sold his London studio, moving to France. In Dieppe, he put on an exhibition of his latest work—of working men around the town. There he also photographed the English post-impressionist, Walter Sickert and the ageing French composer, Camille Saint-Saens. He died at Nice in the south of France on 16th January 1934.

ROGER NEILL

See Also: Australia.

Biography

Born in Melbourne, Australia, on 25th January 1862, Walter Barnett became Australia's first world-class portrait photographer. His Falk Studios was established in Sydney in 1885 and in Melbourne ten years later. In Australia, the main focus of his business was stars of the stage—local and imported—together with his circle of artist friends, politicians and high-society. Through Barnett, the first movie film was shot and developed in Australia. Moving to London in 1897, he established a studio in Knightsbridge, operated under his own name, which attracted celebrities of all kinds—royalty, artistic, governmental etc. He died at Nice, France, on 6th January 1934.

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BARTHOLDI, AUGUSTE (1834–1904)

Born in the little city Colmar, the famous sculptor of the statue of Liberty also practiced photography. He had an interest for the new medium both as a creative image and as a commercial image designated to document his work. After studying in the studio of Ary Scheffer and of the sculptors J.-F. Soitoux and A. Etex, the young Bartholdi was commissioned in 1855 to go to Greece, Egypt and North Africa with his friend, the painter J.-L. Gérôme. Initiated the year before the trip to the calotype technique, he returned with a hundred photographs which have been arousing a justified interest for several years now. With a high sense of composition, Bartholdi recorded the picturesque aspects of Egypt: houses, minarets, bazaars, cafés, shops and landscapes. He only reserved one-fifth of his production for great monuments. The graphism of forms and the harmony of strong contrasts of light and shape reveal his personal way of seeing. Their aesthetic power is obvious even though the technique hesitates a bit. After a trip to Yemen in 1856, Bartholdi abandoned this practice, but kept on using photography, as other artists, as an advertising support and document of his sculptural work.

LAURE BOYER

BASSANO, ALEXANDER (1829–1913)

Between 1870 and 1900, Alexander Bassano ran one of the most successful London High Society photographic studios. Bassano enjoyed a fashionable status comparable to that enjoyed by Camille Silvy and John Jabez Edwin Mayall during the 1860s. His pictures were frequently sold as celebrity photographs or reproduced by the illustrated press. Bassano's most famous photograph is undoubtedly the portrait of Lord Kitchener used for the iconic World War One poster "Your Country Needs You." Many other distinguished sitters also patronised the studio, ranging from Queen Victoria and Lillie Langtry to Cecil Rhodes and the Zulu King Cetewayo.

Alessandro Bassano was born in 1829 and was a direct descendant of Duc de Bassano, secretary to Napoleon. In April 1850, he married an Englishwoman, Adelaide Lancaster, by whom he had three children, a son and two daughters. By 1889, he had anglicised his first name to Alexander.

Bassano spent his early days receiving artistic training in the studio of Augustus Egg, and from the water colourist and scene painter, William Beverley. The reception room at his Old Bond Street Studio contained busts of Duke of Connaught and Prince Imperial that had been sculpted by Bassano. His first studio was at 122 Regent St West (1862–76), and subsequent premises were at 72 Piccadilly West (1870–81); 25 Old Bond Street West (1878–03); 182 Oxford Street (1889); 42 Pall Mall (1891–92); 18 Alphoa Road, London (1892–96).

The Prince of Wales reputedly started off Bassano's run of fashionable sitters when he visited Regent Street studio. Bassano later wrote that when he received the

news of the Prince's visit, as well as having "a feeling of sacredness at the prospect . . . I was a little timid of whether I should be able to rise to the occasion." He went on to photograph most members of the British royal family, including Queen Victoria Princess Helena and the Princess of Wales. Benjamin Constant's late portrait of Victoria, exhibited at the Royal Academy after her death in 1901, was based on a Bassano photograph. In recognition of his royal work, Bassano was appointed Photographer to Her Majesty on 24 November 1890.

Baden Pritchard's visit to Bassano's Old Bond Street Studio sums up the enviable reputation he enjoyed by the early 1880s:

> A handsome suite of rooms on the first floor of fashionable area, a *clientele* that only troubles you only in the season, and sitters who do not object to pay well for the attention they receive. Listen to this, good friends, who believe that photographic portraiture is no longer worthily compensated. (Baden Pritchard, *Photographic Studios of Europe*, 81)

Bassano's Old Bond Street studio was limited to photographs by appointment, while his second establishment at Piccadilly was for more impromptu work. Sittings usually lasted for thirty minutes, although more time was allowed for full or three-quarter length portraits. Each visit cost two guineas, for which the sitter received either twelve cabinet or twenty *carte-de-visite* photographs.

The Old Bond Street studio had several dressing rooms in which Ladies could prepare themselves for their sitting, such as through changing into Court dress. It was one of the first studios to be electrified and, on days when Court levees were taking place, was often open all night long. The principal studio was 26 ft in length and contained a single background that measured no less than 80 ft. It was mounted on perpendicular rollers like a panorama. As it was unrolled, the scene could be changed from outdoor to indoor, from the sublime to the picturesque. Many of Bassano's pictures use elaborate props, inherited from the *carte-de-visite*, such as strips of turf to create rural settings.

In his Old Bond Street, Bassano had a staff of three artists constantly employed as retouchers. Many of the studio's negatives of aristocratic sitters show evidence of skilful and extensive retouching, suggesting Bassano's success stemmed not simply from his artistic proficiency. Bassano also operated a large printing establishment at Kilburn, where his photographs were taken after being retouched and approved.

Bassano's personal view of photography was that it could not idealise but should be "nature apprehended in its most intellectual phrase." In a short article in *The Sketch* in 1903, he put the success of his portraits down to that fact that "I am one of the very few photographers who can show that they enjoyed artistic training and association in early life." Bassano believed that this gave him particular advantages in his understanding of composition and illumination, the two qualities he claimed were most important for taking an artistic picture. His cabinet portraits are usually half or quarter-length portraits, and are notable for the skilful lighting of the sitter. Bassano's article in *The Sketch* claimed that photographic portraiture at the present time was lamentably deficient in these qualities.

Although Bassano enjoyed a hugely successful professional career, unlike some other photographers, he does not seem to have been at the forefront of any technical advances. His only recorded innovation was the attempted introduction of a new size of portrait format in the early 1880s called the Holbein, which measured 7½ × 5 in.

Bassano was claimed to have made £60,000 from his portraits studios. When asked what the secret of his success was, he replied:

> Secrets? Lord Bless you! I have none . . .I have met with some success, but the only secret which has tended to it has been that I have bought to bear upon my work whatever art cultivation, inclination and circumstance have fostered. (Baden Pritchard, *Photographic Studios of Europe*, 82)

Bassano died in 1913 and is buried in Kensal Green Cemetery in West London. The studio underwent extensive refurbishment in 1903, when it was renamed Bassano Ltd, Royal Photographers. The company became Bassano and VanDyck Studio in 1964, Bassano and VanDyck Studio (Incorporating Elliot and Fry) 1965-76, and Industrial Photographic from 1977. The National Portrait Gallery now owns more than 50,000 of the firm's original glass negatives.

JOHN PLUNKETT

See Also: Silvy, Camille; and Mayall, John Jabez Edwin.

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BAUDELAIRE, CHARLES (1821–1867)

French poet and art critic

Baudelaire wrote one of the most famous essays on photography in the nineteenth century. Known as "The Salon of 1859," it is a review of a Parisian art exhibition, the first Salon show to include photographs. Although his literary importance rests with his verse and prose poems, Baudelaire began his writing career as an art critic. To understand better the context of Baudelaire's statements about photography in "The Salon of 1859," it is useful to trace his aesthetic development through his art reviews.

Baudelaire's first published work was a review of the Salon of 1845. Informing his career as art critic was a tradition in French letters that began with La Font de Saint-Yenne in 1747 and Diderot in 1759. The painter Eugène Delacroix and Stendhal's writings on art complete the major influences on Baudelaire's thoughts on the subject of painting and the visual arts in general. Many key phases and concepts that recur in Baudelaire's art criticism appear first in "The Salon of 1845." They include "originality," "reality" or "the real," "the new," "naivete," and "the heroism of modern life." It is noteworthy that in 1845 Baudelaire is impressed with Jean-Auguste-Dominique Ingres, "who is so much in love with detail" (Baudelaire, "The Salon of 1845," *Art in Paris: 1845–1862*, Ithaca: Cornell University Press, 1981, 5).

In announcing his view of criticism in "The Salon of 1846," Baudelaire contends that it "should be partial, passionate and political (Baudelaire, "The Salon of 1846," *Art in Paris: 1845–1862*, Ithaca: Cornell University Press, 1981, 44). Contemporary art, on the other hand, should "contain an element of the eternal and an element of the transitory—of the absolute and of the particular" (Baudelaire, "The Salon of 1846," *Art in Paris: 1845–1862*, Ithaca: Cornell University Press, 1981, 117). With this doctrine he seeks to root the artist's subject in his or her own time and experience. Yet one of the greatest faults that an artist may possess, according to Baudelaire, is to believe that beauty resides in the exact rendering of nature in all her detail. Baudelaire expounds a theory of art derived in part from Delacroix's own theories: nature is a vast dictionary to be consulted yet ultimately transformed by the memory of the artist. "Exact imitation spoils a memory" (Baudelaire, "The Salon of 1846," *Art in Paris: 1845–1862*, Ithaca: Cornell University Press, 1981, 80).

In 1846 Baudelaire has yet to reject photography—specifically daguerreotypy—as a negative, mechanistic medium, but by 1855 in his review of the Exposition Universelle, he solidifies his views concerning the visual arts. Ingres is pilloried by Baudelaire, who on entering a room devoted to the artist's works experiences nothing but boredom commingled with fear. For Baudelaire Ingres's work is now devoid of imagination; he considers it a product of a conscious aesthetic of the "real" devoid of sentiment or the supernatural. This lack of sentiment and the supernatural has already been linked by Baudelaire to the insufferable fashion for "progress," "this gloomy beacon, invention of present-day philosophizing, licensed without guarantee of Nature or of God—this modern lantern throws a stream of darkness upon all objects of knowledge; liberty melts away, discipline vanishes" (Baudelaire, "The Exposition Universelle, 1855," *Art in Paris: 1845–1862*, Ithaca: Cornell University Press, 1981, 125–126).

In "The Exposition Universelle, 1855" Baudelaire unequivocally separates his aesthetics from the "realist" school of painting and "realist" art in general. His concept of the correspondence between the spiritual and the natural and of the underlying unity of all art keeps him at odds philosophically with the perception or representation of nature as an end unto itself. A work that merely describes is not art, according to Baudelaire, because a work of art must transport ideas from the natural world to the supernatural and/or spiritual realm.

Baudelaire's derision of daguerreotypy as expressed in "The Salon of 1859" is what is generally understood to be his absolute and exclusive opinion on the medium. Sociological and cultural factors, as well as the development of Baudelaire's unique artistic vision, seem to support the finality of expression offered in the Salon review. By 1859 Baudelaire has separated "Truth," at least as he believes the public to understand it, from "Beauty." He contends that nature is the only thing in which the public believes and, therefore, the public believes that only the exact reproduction of nature is what art should be. Former graphic artists dominated the photographic "industry" of mid-nineteenth-century France: Daguerre epitomized this world. Baudelaire's diatribe against photography in "The Salon of 1859" is a political tract that appears to attack Daguerre as "Messiah" of this new industry but remains more completely a denunciation of the public. Although daguerreotypists are co-conspirators with the public, it is the public's unquestioning belief in nature that offends Baudelaire. He rails against the failure of the public to doubt, to think, and to challenge the world in which it lives and links this failure with the ascendancy of the belief in progress that specifically partakes of science and mechanistic inventions and discoveries.

Baudelaire may not have even attended the Salon of 1859. In one letter to his friend Nadar, he claims first that he is currently writing on the Salon show without having seen it and then retrenches somewhat in a second letter by stating that he had lied a little and had made one—and only one—visit. Baudelaire professes to rely on a "livret" describing the exhibition for his analysis.

The image has taken second place behind writing for Baudelaire: what there is to know about this exhibition and its contents exists in the political, social, or aesthetic philosophizing that Baudelaire wishes to make. "The Salon of 1859" is a work on the philosophy of art and therein lies its greatness. Baudelaire's denunciation of photography is a convenience to introduce the more important concept of the imagination in relation to art. It does not provide a complete picture of his relation to photography. Photographers, most specifically Nadar, were among Baudelaire's close friends, and Baudelaire was quite willing to sit for his own photographic portrait, e.g. with Étienne Carjat, Charles Neyt, Nadar, as well as the son Paul. He even contributed one of his poems, "Le Reniement de Saint Pierre," to Nadar's album for guests/clients who visited his photographic studio.

Baudelaire's letters reveal his conflicted emotions regarding the relatively new medium of photography. In an 1861 letter he claims that "photography can produce only hideous results" (Baudelaire, *The Letters of Charles Baudelaire to His Mother, 1833–1866*, New York: Haskell House, 1971, 187)—a comment prompted by activities relating to the illustrations for the *fine* edition of *Les Fleurs du mal* [The Flowers of Evil].

In a letter from December 1865, however, he requests that his mother provide him with her photographic portrait:

> I would very much like to have a photograph of you. It is an idea *which now obsesses me*. There is an excellent photographer in Havre ... [but] *I must be there*. You know *nothing about them*, and all photographers, even the best, have ridiculous mannerisms. They think it is a good photograph if warts, wrinkles, and every defect and triviality of the face are made visible and exaggerated; and the HARDER the image is, the more they are pleased. (Baudelaire, *The Letters of Charles Baudelaire to His Mother, 1833–1866*, New York: Haskell House, 1971, 275–276)

Baudelaire represents the conflicting sentiments among many nineteenth-century aestheticians regarding the upstart field of photography. Is it a mechanical trade or an artistic medium? Few published writers indulged in the discussion that it could be both: most took a side either for or against the consideration of photography as art.

NANCY M. SHAWCROSS

Biography

Charles-Pierre Baudelaire was born in Paris, France on 9 April 1821 to Joseph-François Baudelaire and Caroline Dufays. His father died in February 1827; 18 months later his mother married Jacques Aupick, a general in the army who later become the French ambassador to the Ottoman Empire and Spain and then a senator. Initially schooled in Lyons, Baudelaire completed his education in Paris but was expelled from college in 1839, after which he briefly studied law. Around 1840 he contracted syphilis, from which he would ultimately die. Living the life of a dandy in Paris, Baudelaire exhausted half of his inheritance within two years of turning 21. He wrote his first art reviews in 1845 concerning that year's Salon exhibition, followed by reviews of the Salons of 1846 and 1859, as well as the Exposition Universelle of 1855. His first published literary works were the short story *La Fanfarlo* [The Fanfarlo] in 1847 and a translation of Edgar Allan Poe in 1848; his first poem was published in 1851. In the 1850s Baudelaire continued to translate works by Poe and published his poetry in earnest, culminating with *Les Fleurs du mal* [The Flowers of Evil] (1857) and *Les Paradis artificiels* [Artificial Paradises] (1860). An expanded second edition of *Les Fleurs du mal* was published in 1861. In the 1860s, Baudelaire suffered from failing health and continued to be plagued with financial troubles. A debilitating stroke in 1866 forced him into a nursing home where he died on 31 August 1867.

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BAUER, FRANZ ANDREAS (1758–1840)

Austrian Artist

The botanical illustrator Franz Bauer was born in Feldsberg, Austria. After persuasion by Sir Joseph Banks (1743–1820), who remained his patron, he took up a position as a resident draughtsman at Kew in 1790 and he received a life annuity of £300 after Banks' death on condition he remained at Kew. Bauer took an active role in wider discussions on science, botany and medical matters forming acquaintances with many of the leading scientists and figures of the day. He became a Fellow of the Linnean Society in 1804 and the Royal Society in 1821.

In mid-September 1827 Joseph Nicéphore Niépce (1765–1833) arrived in Britain to visit his seriously ill brother Claude. He also used the opportunity to explore

the possibility of commercial exploitation of his heliograph process which produced etchings on metal and had been developed in 1826–27. On the recommendation of William Towsend Aiton (1766–1849), he met Bauer on 20 November who asked him to submit to the Royal Society an account of his heliogravure process. Niépce wrote a longer four-page account *Notice sur l'héliographie* dated 8 December 1827 in which he referred to fixing the image of objects by the action of light. Despite introductions to Dr William Hyde Wollaston and Sir Everard Home both Vice Presidents the paper was never published by the Society and no lecture was given because Niépce would not disclose the detail of his process. Niépce brought with him experimental plates with images made using light-sensitive bitumen of judea, a type of asphaltum, which were to be shown at the proposed lecture; these and the account were left with Bauer on Niépce's departure.

Niépce's plates that had been given to Bauer were eventually exhibited at a Royal Society soiree on 9 March 1839 alongside photogenic drawings of Talbot and Herschel. Three heliographs showing copies of engravings of *Cardinal d'Amboise*, *Christ Carrying the Cross* and *Elodie, a stage design* eventually ended up in the collection of the Royal Photographic Society. The only picture from life *View from the Window at Le Gras* circa 1826 was rediscovered by Helmut Gernsheim in 1952 and now resides at the University of Texas and is considered the world's first photograph.

Niépce returned to France probably in early February 1828 disappointed at the lack of interest in his work and his brother died at on 10 February. Bauer died on 11 December 1840. Both were buried in St Anne's Churchyard, Kew Green.

MICHAEL PRITCHARD

BAUSCH AND LOMB

The origins of Bausch and Lomb date to 1853 when John Jacob Bausch (1830–1926) established an opticians shop in Rochester where he sold spectacles imported from Germany. He was supported financially by a Rochester-based German cabinet maker Henry Lomb (1828–1908) and on Lomb's return from the Civil War the two began a formal partnership in 1863 as Bausch & Lomb. Lomb later moved to New York as the company's representative from 1866 to 1880. From 1866 until 1876 the company was known as the Vulcanite Optical Instrument Company, reverting back to the Bausch and Lomb Optical Company in 1876. The firm expanded rapidly establishing factories in Rochester and in 1874 they moved to St Paul Street where they were to remain until 1975.

In 1874 Bausch's eldest son, Edward, began the expand the firm's manufacturing activities to optical instruments and Ernst Gundlach was hired. Gundlach had worked in various European optical firms before emigrating to the United States. He left Bausch and Lomb in 1878 and established his own optical and photographic business. A microscope was the first successful product and by 1903, 44,000 had been sold. Edward Busch (1854–1944) was the driving force behind the firm's photographic optical activities and patented an iris diaphragm shutter in 1888 and the Plastigmat lens in 1900. He became president of the company on his father's death and was a major benefactor in Rochester.

In 1883 the company began to make photographic lenses and in 1888 they began making photographic shutters. By 1903, 500,000 photographic lenses and 550,000 shutters had been made. The firm's lenses and shutters were used almost exclusively by Eastman Kodak from the introduction of the original Kodak of 1888 and the two companies enjoyed a long mutually beneficial relationship. Bausch and Lomb's high profit margins, even after negotiations to reduce these, finally encouraged George Eastman to establish his own lens making works from 1911 after which Kodak's orders quickly declined.

The firm was licensed by Carl Zeiss in 1892 to make Zeiss Anastigmat and other lenses for the American market and they also made Compound and Compur shutters for Deckel.

The first world war ended these licensing arrangements and as the supply of optical glass ceased in 1915 Bausch and Lomb became the first American manufacturer of optical glass in the United States building on experiments it had been conducting since 1912. By 1917 the company was producing upwards of 40,000 pounds of barium crown glass per month, fulfilling more than two-thirds of the government's wartime requirements for glass for munitions. In 1919 it offered twenty-five different types of glass. Manufacture ceased in 1986.

The firm's photographic lenses were used on television cameras on the 1964 Ranger 7 spacecraft, but it was increasingly moving into contact lenses and consumer eye care products with approval in 1971 from the Federal Drugs Administration to market soft contact lenses. The firm remains in Rochester.

MICHAEL PRITCHARD

See Also: Kodak; and Eastman, George.

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BAYARD, HIPPOLYTE (1801–1887)
French photographer

Hippolyte Bayard, one of the pioneers of early French photography, discovered a process for making direct positive photographs on paper in 1839. Although his invention was eclipsed by the brilliant success of fellow Frenchman Louis Jacques Mandé Daguerre, Bayard nevertheless deserves greater recognition for his role as an independent inventor of photography than he has generally been accorded.

Bayard was born on 20 January, 1801 in Breteuil sur Noye, a small down located in the department of the Oise. The son of a justice of the peace, Bayard worked as a clerk in a notary office before moving to Paris where he obtained a position as a civil servant in the ministry of Finance. According to an early biographer, Bayard's father, who was an avid gardener, experimented with the chemical actions of sunlight on the skin of ripening fruit. Cutting out letters or numbers from a dark piece of paper and wrapping it around a peach as it ripened on the tree, Bayard senior effectively created a "signed" piece of fruit, for the skin of the peach remained light where it had been masked by the paper and darkened in the areas that had received exposure to sunlight.

Whether or not Hippolyte Bayard's interest in photography can be traced back to his father's experiments with photographic writing on peaches, it is clear that he became interested in the chemical actions of light sometime in the 1830s. Although he worked as a government functionary, Bayard's social sphere in Paris included painters, printmakers, stage designers, writers, and actors, many of whom he met through his childhood friend Edmond Geffroy, an actor at the Comédie Française. Through Geffroy, Bayard met the painter Amaury-Duval and seems to have frequented his studio in the 1830s. In this milieu of intellectual discourse and artistic experimentation, Bayard would likely been aware of attempts by Niepce, Daguerre and others to fix the image produced by a camera obscura by means of chemical manipulation.

The official announcement on 7 January, 1839 by scientist and politician François Arago of Daguerre's discovery of a method for capturing the image from a camera obscura seems to have spurred Bayard into action. By 20 January of that year, Bayard had begun experimenting with the light-sensitive properties of silver chloride. By 5 February, two weeks after William Henry Fox Talbot showed his "photogenic drawings" to the Royal Institute, Bayard invited the physicist and member of the French Academy of Sciences César Despretz to view his first photographs. These appear to have been similar to Talbot's "photogenic drawings," that is, negative images made by soaking paper in silver chloride, covering one side with a layer of silver nitrate, placing an object on the paper and exposing it to light.

Seemingly unaware of the value of a negative image that could yield positive prints, Bayard continued to search for a way to produce direct positive images. His progress was rapid, for, according to according to a notebook preserved at the *Société Française de Photographie*, on 20 March, 1839 he showed to friends his first direct positives on paper.

In February 1840, Bayard described his process for making a direct positive on paper. A sheet of paper was "salted" writing paper by soaking it in a solution of sodium chloride. After the paper dried, it was sensitized by floating it in a silver nitrate bath to create light-sensitive silver chloride. The paper was then exposed to light until it turned black (due to the action of light which converts the silver chloride into silver metal), washed, dried, and kept in a portfolio until use. Immediately before use, the paper was soaked in an potassium iodide solution, placed in the camera, and exposed to light. The areas of the paper that received light were bleached in proportion to the intensity of light exposure, while areas that did not receive light remained dark. The paper was then fixed in sodium thiosulfate and washed in water and ammonia.. The resulting image was a unique, laterally reversed, positive photograph. The slight orange tint typical of many of Bayard's direct positives on paper is the result of his use of potassium iodide.

Bayard continued to improve his process and by the end of May had shortened the exposure time from one hour to approximately fifteen minutes, depending on light conditions. On May 20, he showed his direct positive prints to Arago, Daguerre's champion. According to Bayard, Arago convinced Bayard not to reveal his discovery immediately. Bayard, who later concluded that Arago's advice was designed to stall him until Daguerre's experiments were published, would come to feel that his rightful place as inventor of photography had been usurped.

Whatever the truth of this claim, Bayard did in fact exhibit direct positive prints on paper in July 1839, several weeks before the public unveiling of Daguerre's process at the French Academy of Sciences. The occasion was an exhibition of art benefiting the victims of a recent earthquake in Martinique. The first known public exhibition of photography, Bayard's direct positive prints (among them a number of still lifes) roused great interest and were praised for their artistic merit by several major Parisian newspapers, including *Le Moniteur universel* and *Le Constitutionnel.* The latter enthused over Bayard's photographs, writing that "we are not competent to discuss the intrinsic merits of Mr. Bayard's process, nor compare it to that of Daguerre. But the results obtained by Mr. Bayard are of an exquisite fineness, a harmonious softness of light that painting

Bayard, Hippolyte. In the Studio of Bayard. *The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.*

will never attain. Nothing could be more charming that these little forms bathed in elusive half-light, like the chiaroscuro of nature. Art must resign itself in comparisons such as these to remain ever inferior to reality" (Gautrand, 1986, 24).

Despite the great interest these photographs provoked, Bayard did not officially present his invention in an institutional setting until several months after the publication of Daguerre's process for making direct positives on metal. On November 2, the architect Désiré Raoul-Rochette presented a report on Bayard's invention to the Académie des Beaux-Arts praising Bayard's invention on both practical and artistic grounds. Rochette noted that unlike the daguerreotype, Bayard's process enabled the papers to be prepared up to a month ahead of time, thus reducing the equipment needed to make an exposure. More significantly, the report found that Bayard's process possessed artistic advantages over the daguerreotype, for the paper support yielded a vagueness of contour and rich harmony of warm tones that suggested an artistic sensibility and recalled the *sfumato* of old master drawings. Writing in 1851, the critic Francis Wey would reiterate Rochette's praise, recalling that when he first saw the photographs in 1839 "they resembled nothing I had seen.…One contemplates these direct positives as if through a fine curtain of mist. Very finished and accomplished, they unite the impressionism of reality with the fantasy of dreams: light grazes and shadow caresses them" (Gautrand, 1986, 24–5).

Despite the acclaim surrounding the exhibition and the support of the Academy of Fine Arts, Bayard failed to receive recognition he desired for his inventions, nor did he achieve the level of state support that was awarded to Daguerre. As a reaction to the injustices he felt he had suffered, Bayard created witty, enigmatic photograph of an inert man entitled *Self Portrait as a Drowned Man*. Bayard inscribed the back of this self-portrait with the following narrative

> *"The corpse which you see here is that of M. Bayard, inventor of the process that has just been shown to you. As far as I know, this indefatigable experimenter has been occupied for about three years with perfecting his discovery.… All those who have seen his pictures admired them as you do at this very moment, although he considers*

them still imperfect. This has brought him honor, but not a single penny. The Government, which has been only too generous to Monsieur Daguerre, says it can do nothing for Monsieur Bayard, and the unhappy wretch has drowned himself in despair.

Oh human fickleness! For some time, artists, scientists and the press took an interest in him, but now that he has been at the morgue for several days, nobody has recognized him. Ladies and gentlemen, let us discuss something else so as not to offend your sense of smell, for as you can see, the face and hands of the gentleman are already beginning to decay." (Gautrand, 1986, 221)

In fact, Bayard's hands and face appear darker in tone than the rest of his body because they were sunburned when this photograph was made.

In spite of his failure to achieve the recognition he craved, Bayard remained an important and productive member of the French photographic community for the rest of his life. He continued to explore photographic chemistry, including methods for developing the latent image on paper. Invented by Bayard in 1839, but not presented at the French Academy of Sciences until Feburary 8, 1841—the timing no doubt spurred in part by Talbot's announcement of his discovery of the latent image phenomenon in early January —Bayard's process entailed preparing a sheet of paper with potassium bromide and silver nitrate, exposing it while still wet in the camera, and then exposing the paper to mercury vapors (as in Daguerre's process) to reveal the latent image. Bayard also described a second method for developing the latent image which entailed soaking paper in a sodium chloride solution, allowing it to dry and then covering it with a silver nitrate solution. Once dry, the sheet was exposed to the vapor of iodine crystals (to form silver iodide), exposed in the camera, then exposed to mercury vapor, and finally fixed in a hyposulfate solution. In both cases, the final images were negative.

By 1842, Bayard was using the paper negative (calotype) process only recently introduced by Talbot to create a series of photographs of Montmartre. The two may have met when Talbot visited Paris in 1843; certainly they were aware of each other's work, as the presence of several salted paper prints by Talbot in one of Bayard's albums suggests. By 1846, Bayard seems to have fully abadoned his direct positive paper process in favor of a modified version of Talbot's paper negative process, which he employed with great skill to make portraits, self-portrait, still-life studies, genre scenes, and photographs of Paris and its environs. Bayard's city views, among the first photographic records of the changing urban texture of Paris in the 1840s, include a series on Bayard's own neighborhood, the Batignolles (1845), the Seine and other aspects of Paris (1847–8), and the barricades erected during the Revolution of 1848. Bayard's skill with the paper negative process is also evident in the series of portraits he made in the 1840s. Likely made for personal rather than commercial purposes, many of these salted paper prints reveal a simple yet strong composition that concentrate attention on the nuances of his sitters' personalities.

An inveterate explorer, in the early 1840s Bayard also used the daguerreotype process, and beginning in 1849–50 produced highly accomplished prints from albumen on glass negatives. After 1851, Bayard also employed the collodion wet plate process. Although he began his photographic career as an amateur, by 1846, he was actively selling photographs through print shops (including English dealer F. Sinnett's shop at 10 Rue Vivienne). In 1855, he opened his own studio at 14, Port-Mahon and in 1861, he founded a portrait studio with Bertall (Charles Albert d'Arnoux), where he made portraits, landscapes, reproductions of art, and *cartes de visite* and was among the first photographers to exploit the possibilities of mass production of photographic prints.

Bayard also played an important role in the institutional development of French photography. He was commissioned in 1843 to make daguerreotypes of the Chateau de Blois, which were later used by the architect Felix Jacqued Duban for his restoration project. In 1851, Bayard was hired by the Commission des Monuments Historique, a wing of the French Government, as one of the founding photographers of the Mission Héliographique, an initiative to document the historic sites and monuments of France by means of photography. The only one of the five to employ glass negatives, Bayard photographed numerous architectural sites in Brittany and Normandy, some of which were published in 1853 by Blanquart-Evrard in the latter's album *Souvenirs Photographiques.*

Throughout his photographic career, Bayard enjoyed significant critical and commercial success, particularly from the early 1850s onward, when the paper negative and the negative–positive process definitively triomphed over the daguerreotype in France. In 1849, Bayard won a silver metal for prints made using glass negatives at the Paris industrial exhibition. In 1851, he garnered another medal at the Cyrstal Palace exhibition in London. In 1854 he became a founding member of the Societé Française de Photographie, and served as its secretary from 1865 until 1881. He participated in the Société's exhibitions in 1855, 1857, and, with Bertall, in 1863, 1864, and 1865. In 1862, the pair received a medal at the Universal Exhibition in London. In 1863, The French government awarded him the medal of the Legion of Honor for his contributions to photography. He retired to Nemours in 1869 and died there on May 14, 1887.

The bulk of Bayard's oeuvre is conserved at the Societé Francaise de Photographie, Paris, which holds some 600 prints as well as notebooks and other archival

materials. Other significant institutional holdings of Bayard's work include The George Eastman House, Rochester, The J.Paul Getty Museum, Malibu; Harry Ransom Humanties Research Center, Austin; The Art Institute of Chicago.

SARAH KENNEL

Biography

Hippolyte Bayard was born January 20, 1801, in Breteuil sur Noye, in the Oise district of France. Son of a justice of the peace, Bayard worked as a notary before moving to Paris in the late 1820s, where he was employed by the Ministry of Finance. Bayard began to experiment with photographic chemistry in January 1839; by March 1839 had invented a process for making direct positives on paper. Over the next three decades, he made portraits, landscapes, still lifes, and architectural images using a variety of processes, including daguerreotype, paper negative, albumen, and wet plate collodion. A founding member of the *Sociéte Héliographique* (1851) and the *Société Française de Photographie* (1854), Bayard opened a commercial studio in 1855 at 14, Port-Mahon. In 1861, he and Bertall opened a commercial portrait studio that specialized in *cartes de visites.* He exhibited at the *Société Française de Photographie* (1855, 1857, 1863–65), and won medals at the Paris Industry exhibition in 1849, the London Crystal Palace exhibition (1851), and the London Universal Exhibition (1862). He died in Nemours, France, on May 14, 1887.

See Also: Arago, Francois Jean Dominique; Blanquart-Evrard, Louis-Désiré; Daguerre, Louis-Jacques-Mandé; Talbot, William Henry Fox; Wey, Francis; Mission Héliographique; Positives: minor processes; and Inventions.

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BAYLISS, CHARLES (1850–1897)

English born photographer

Bayliss was born in 1850 in Hadleigh, Suffolk, the son of Charles Baylis (sic) a sadler and Elizabeth Gardiner. The family immigrated to Melbourne in 1852 aboard the *Moselle.* In 1866, aged 16 Bayliss joined Henry Beaufoy Merlin in the American & Australian (sometimes Australasian) Photographic Company in 1866, spending four years touring Victoria and New South Wales, visiting towns and photographing every dwelling then offering these for sale to the locals. Merlin set up a studio in Sydney in 1870 then he and Bayliss continued there endeavour to visit as many towns as possible, which included the gold mining towns of Hill End and Gulgong during 1872. Following Merlin's death in 1873, Bayliss returned to Victoria taking views including a 9 panel 360º panorama of Ballarat in 1874. Under the patronage of Bernard Hotlermann, Bayliss made a panorama of Sydney in 1875 and then from 1876 he is listed with a studio at a succession of addresses in George St., Sydney. He produced further panoramas including another of Sydney in 1879 and these were entered in various exhibitions in America, Europe and Australia. During March 1880 Bayliss travelled to Queensland, and took mammoth plate views around Maryborough. In 1886 Bayliss was appointed official photographer to the Royal Commission on Water Conservation and in this capacity photographed extensively along the Darling River. Bayliss was one of Australia's most accomplished landscape photographers. He died 4 June 1897.

MARCEL SAFIER

Holdings

State Library of NSW, Sydney; State Library of Victoria, Melbourne; National Library of Australia, Canberra; National Gallery of Australia, Canberra; Maryborough Historical Society, Qld.

BEALS, JESSIE TARBOX (1870–1942)

Canadian-born American photojournalist

One of the first American photojournalists. Beals was a teacher from the age of 18, whose interest in photography was sparked by winning a camera in a competition. She resigned from teaching after realising she could make more money as a professional photographer. In 1897 she married Alfred Beals. She selected paying clients for her portraits, and instructed her husband on how

to operate the darkroom. In 1900, Beals' photographs were published in the Windham newspaper; the resulting credit line establishes her as the first published female photojournalist. She was then awarded the post of first female staff photographer in the USA, for the Buffalo Courier, in 1902.

In 1904, she was the first female to obtain an official press pass to photograph the Louisiana Purchase Exposition. Her most famous photograph of the fair was an aerial photograph taken nine hundred feet in the air, for which she was awarded a gold medal by the Exposition. Beals' tenacity was further illustrated when she stopped President Roosevelt at the fair and asked if she could photograph him. Beals diversified so that her work ranged from portraits of literary and entertainment figures to urban, interior and garden photography. She photographed the slums of New York in an attempt to assist the Community Service Society and even did some writing and illustrating of books of poetry. Beals divorced in 1924, and moved with her daughter to Greenwich Village; where her photos of the people, the haunts and the studios, earned her the title of 'official photographer of Greenwich Village.'

Jo Hallington

BEARD, RICHARD (1801–1885)

British inventor, entrepreneur, patent-holder, and photographer

In a remarkably short period of time, Richard Beard progressed from being a wealthy coal merchant, to being one of the most influential figures in the development and promotion of photography in England.

His interest in the commercial potential of photography, and in the daguerreotype which was to dominate several years of his life, can be traced back to mid-1839. By that time, the daguerreotype process was known in England through Miles Berry's British Patent No.8194, which had been filed in August 1839 on behalf of Louis Jacques Mandé Daguerre. By the following year Beard had been introduced to the innovative mirror camera design of Alexander S. Wolcott. His first personal involvement in a photographic patent came in mid-1840 (British Patent 8546) when he patented Wolcott's camera design on behalf of himself and John Johnson, an American photographer who was also Wolcott's business partner. Included in that patent were several significant improvements upon Daguerre's original formulation for the process.

Beard later bought Johnson's interests in the camera, and made it available only to his patentees. Thus daguerreotypes produced using his system were not laterally reversed, while those taken with cameras using lenses were. While Beard never publicly stated how much he eventually paid to acquire all interests in the Wolcott camera in England and Wales, Johnson later claimed that £7000 had changed hands.

By summer 1840, Beard had completed negotiations with Daguerre and Joseph Nicéphore Niepce—through their patent agent Miles Berry—and acquired exclusive rights in the daguerreotype in England, Wales, Berwick-upon-Tweed, and the 'Colonies and plantations abroad.' Uniquely missing from these patent rights were Scotland and Ireland, each with its own legal system and separate patent laws. Apparently Berry had seen no merit in paying for such patent protection, a decision which considerably encouraged the development of photography in Scotland. Of significant interest here is the fact that Beard patented both the Wolcott camera and his "improvements" in the process in both these countries. Two Scottish Patents were filed, No.144 in December 1840 and No.148 in November 1841, and one Irish Patent, No. 229, in April 1841. Thus photographers in Scotland and Ireland were free use Daguerre's original process without fear of patent infringements, but not Beard's improvements.

While negotiating with Berry et al., Richard Beard had been working to improve the sensitiveness of the daguerreotype plate. Through the expertise of the chemist John Frederick Goddard, sensitivity was increased substantially—sufficient to make studio portraiture practicable—and with John Johnson, Beard opened England's first professional photographic portrait studio at the Royal Polytechnic Institution in Regent Street, London, in March 1841. Goddard's achievement was to replace the iodine in Daguerre's original formulation with bromide of iodine, and by so doing, he reduced exposures to between one and four minutes in bright light —which was sufficiently brief to make studio portraiture a practical proposition. Interestingly, the patents which embrace Goddard's improvements all claim to have been communicated to Beard "by a certain foreigner working abroad."

The Royal Polytechnic Institution was a unique and highly popular venture in the heart of London, a place where the latest inventions, innovations and ideas could be seen, explored and debated. Large numbers of visitors each paid a shilling to pass through its doors. It was appropriate that the first photographic studio should be established there, and despite the imposition of an admission charge in addition to his prices, Beard's financial return from the glasshouse studio was considerable.

Before opening his first studio, he had also conceived a bold idea to license the daguerreotype process on a strictly controlled regional basis, thus granting each licensee a clear monopoly.

The first such licensed operation opened in Plymouth in July 1841, and was followed by *Photographic Institu-*

tions in Bristol, Cheltenham, Liverpool, Nottingham, Brighton, Bath and Manchester. Two further studios were opened in London in 1842—one in King William Street, and the other in Parliament Street, the former being managed by Beard's eldest son, Richard Beard Jnr. from about 1846.

The granting of exclusive licenses permitted Beard to charge high prices to his licensees, and enabled them to extract high returns from their investment. As some photographers paid over £1000 for their licenses, a considerable return was essential. The lack of competition, however, considerably restricted the growth of photography in England. Beard aggressively prosecuted breaches of his patent rights through a number of celebrated court cases, but there can be no doubt that the exclusivity of his establishments worked against the public interest. Even some of those Londoners who could afford to have their likeness made, complained about the time involved in waiting to be photographed, and in 1846 he eventually agreed to license more studios.

Years ahead of his time in the thinking behind such franchise agreements, Beard controlled the manufacture sale and distribution of the equipment and materials which accompanied professional portrait photography —including cameras, frames, mats (overlays), preservers, and cases. Approved products were identified with the words "Beard Patentee"—embossed on the faces of frames or brass mats and on printed labels inside morocco cases. There is evidence that some of his cases and their fittings were made for him by Thomas Wharton, a Birmingham manufacturer whose involvement with case-making predated photography. A small number of the "Patentee" labels bear Beard's original signature in blue ink, perhaps identifying himself as the photographer. Beard's 1842 Patent No.9292 described a method of hand-tinting the daguerreotype—already within a year after the first studio opening, the absence of colour had been identified as a shortcoming of the new process. The procedure was based on proposals by Johann-Baptiste Isenring.

By 1845 he was entering into concession agreements with photographers who could use the process without buying a license, in return for a share in the profits, and by the 1849, he was legally bankrupt, although whether by business failure or business planning remains open to debate. Later studios in Manchester and Liverpool traded under the partnership name of Beard and Foard, and it remains uncertain whether this was Richard Beard or his son Richard Beard Jnr. He was also a partner in a London studio, Sharp & Beard, in the later 1850s.

He appears to have retired completely from photography by 1858, and applied himself to a range of other business opportunities until his death.

JOHN HANNAVY

Biography

Richard Beard was born in Devon in December 1801, the second of six children, four of whom did not survive beyond their mid-teens. He joined the family grocery business in Newton Abbott and while still in his early twenties, was effectively in charge. He moved to London in 1832 and went into partnership with a coal merchant, establishing Pope, Beard & Company, later to become Beard & Company. With his wife Elizabeth, he had six children, the first of whom, Richard Jnr, followed him into photography. After leaving photography, he lived for many years in Hampstead, London, where he died on June 7th 1885.

See Also: Daguerre, Louis Jacques Mandé; and Niepce, Joseph Nicéphore.

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BEATO, ANTONIO (c. 1830–1903)

Itinerant photographer

For many years, historians believed that a photographer by the name of Felice Antonio Beato had photographed extensively throughout Japan, China, Egypt and the Holy Land. This error came about as a result of the two brothers Felice Beato and Antonio Beato signing some of their works with a composite name.

Antonio Beato worked with his brother for several years, opening a studio with him in Calcutta c.1858. By 1862 he had set up a studio in Cairo, with another studio in Luxor opening a decade later. His work was sold widely to those travellers who undertook the Grand Tour of Egypt from the 1870s until the end of the nineteenth century.

Beato's Egyptian images are distinctively different from those of Francis Frith. While Frith concentrated on the grandeur of the antiquities, in Beato's images people

going about their daily work are of at least equal importance to the grandeur of their architectural settings. His output embraced landscape, architecture and people, and many images bear the legend 'A Beato' handwritten onto the collodion negative. Some also have an additional ink signature on the print. Additionally, several of Beato's images exhibit a pink hue to the highlights, believed to have been introduced by dyeing the albumen to give a warmer alternative to the conventional albumen print.

JOHN HANNAVY

BEATO, FELICE (c. 1834–1906)

Corfu-born photographer and merchant of British nationality

Despite Felice Beato's reputation as a pioneer war and travel photographer, many aspects of his life and background remain unknown. At a meeting of the *London and Provincial Photographic Association*, he was described as "a Venetian by birth, but now a naturalised Englishman," however no firm evidence has emerged to substantiate this claim of 'Italian' birth. Current research indicates that he was born on the island of Corfu around 1834.

Like his brother Antonio Beato, Felice obtained his knowledge of photography in the mid-1850s from his brother-in-law James Robertson, chief engraver of the Imperial Mint in Constantinople. The correspondence of the French military artist Jean-Charles Langlois provides the earliest known reference of his photographic activities. In a letter from the Crimea, dated 30 April 1856, Langlois noted the presence of Robertson's assistant at work photographing the stationed troops: "We believed that the figure was not Robertson himself, but his first student, a replacement." A few days later Langlois confirmed the identity of this assistant with evident disdain for his work: "Certainly this M. Beato is no artist." While this judgment perhaps reflects Beato's inexperience in the field, his formative training in the Crimea enabled him to establish strong ties with the British officer class that would prove invaluable in his future career (see Gartlan).

> Over the next year Felice Beato continued to work as Robertson's able assistant in several Mediterranean locations as their professional relationship gradually transformed into a collaborative partnership. En route for London in September 1856, Robertson left an assistant in Malta to manage his operation, and once again, Beato was almost certainly delegated this task. On 3 March 1857, Robertson and his two brothers-in-law, Felice and Antonio Beato, registered their arrival in Jerusalem at the British Consulate. Given that the prints taken thereafter in Jerusalem, Athens, Constantinople and Egypt were signed either 'Robertson and Beato' or later 'Robertson, Beato & Co.' (unlike the former accreditation of prints to Robertson alone), Felice Beato appears to have gained some recognition from his elder mentor for his contribution to the enterprise's success.

Beato began his own independent photographic career on his embarkation for Calcutta in early 1858. He travelled widely through northern India, photographing the embattled buildings still evident months after the Sepoy Rebellion at Lucknow, Delhi, and Cawnpore (now Kanpur), and preparing a portfolio of architectural views of Agra, Benares, and Amritsar. His gruesome photographs of the Lucknow massacre, in which the exhumed remains of numerous Indian insurgents lie strewn on the city streets, established his penchant for battlefield scenes showing the dishevelled victims of British military action. Among the earliest photographs to portray corpses on the battlefield (although like Alexander Gardner, Beato certainly 'arranged' his war scenes), these images differed markedly from the earlier absence of corpses in the Crimean War photographs of Roger Fenton and James Robertson. In subsequent years, Beato accompanied military forces as a war photographer in China (1860), Japan (1864), Korea (1871), the Sudan (1885) and Burma (1886). From July 1858 to December 1859, Antonio Beato assisted his brother in the management of a studio in Calcutta until he returned to Egypt to eventually open his own studio at Luxor in 1862.

On 26 February 1860, Beato left Calcutta for Hong Kong to join the Anglo-French forces gathering in readiness for a retaliatory campaign to North China. Over the next eight months, he assembled a comprehensive record of the campaign, from the first encampment at Kowloon to the final destructive events in Beijing. Beato displayed his enthusiasm for battlefield scenery soon after the allied forces captured the strategic Dagu forts on 21 August 1860. The memoirs of the military surgeon, Dr. David Field Rennie, provide some insight into Beato's eagerness on the battlefront:

> I passed into the fort and a distressing scene of carnage disclosed itself; frightful mutilations and groups of dead and dying meeting the eye in every direction... Signor Beato was here in great excitement, characterising the group as "beautiful," and begging that it might not be interfered with until perpetuated by his photographic apparatus, which was done a few minutes afterwards. (Rennie, 112)

Gathered into albums in chronological order, these photographs were sold to numerous British officers and soldiers in the course of the campaign. Although the experienced photographer Antoine Fauchery also accompanied the French forces, Beato's portfolio constitutes the only substantive photographic record of the campaign and includes the earliest known photographs of Beijing.

Beato, Felice. Lord Arima's Quarters, Edo.
The Metropolitan Museum of Art, Purchase, The Horace W. Goldsmith Foundation Gift, 1996 (1996.109.1) Image © The Metropolitan Museum of Art.

Soon after his arrival in London in October 1861, Beato sold the rights to his India and China images to the commercial publisher Henry Herring. The following summer, Herring exhibited the portfolios at his Regent Street premises, though he planned to market the collection primarily by mail subscription. While the commercial success of this venture was probably modest, Herring's subscription list provides scholars with a valuable resource for the study of Beato's India and China portfolios (for reproduction see Harris, *Of Battle and Beauty,* 177–180).

During the Anglo-French campaign in China, Beato met the British artist and *Illustrated London News* correspondent Charles Wirgman. A resident of Yokohama since May 1861, it was probably at Wirgman's instigation that Beato decided to first visit Japan. By 13 July 1863, as Wirgman noted in one of his regular columns, Beato's photographs were already attracting attention in Yokohama: "my house is inundated with Japan officers, who come to see my sketches and my companion Signor B-'s photographs." (*ILN,* 26 September 1863, 303) Between 1864 and 1867, the two colleagues operated the influential firm of 'Beato and Wirgman, Artists and Photographers.' Beato was primarily responsible for popularising the practice that would become a hallmark of the Yokohama photographic industry: the hand-coloured albumen print. He travelled extensively throughout Japan, on occasion accompanying ambassadorial delegations in order to gain access to regions otherwise restricted to foreigners. Although he continued to serve as a war photographer, accompanying the punitive expedition to Shimonoseki in 1864, his topographical and studio genre work predominated in the 1860s.

On 26 November 1866, a devastating fire destroyed Beato's photographic studio and stock along with most of Yokohama. This disaster stymied Beato's desire to send the *Bengal Photographic Society* "a set of views, not only of scenery in Japan, but also of native portraits in *cartes-de-visite,* illustrative of the different dresses, customs, and habits of the people." (*Journal of the Bengal Photographic Society,* March 1867, 25) Despite this setback, Beato quickly rebuilt his portfolio and only five months after the fire, the *Bengal Photographic Society* received "an Album of Photographic views and costumes taken in China and Japan, chiefly by Cigni Bento of Yokoham[a]." (*JBPS*, March 1867, 5) Over the next year, Beato continued to rebuild an inventory of Japanese 'views' and 'costumes' published in various leather-bound album formats, often with the embossed cover title *Vues du Japon* or *Views of Japan* (Bibliothèque nationale, Paris). One superb example preserved in the Victoria and Albert Museum, London, and published in 1868 with the title *Photographic Views of Japan by Signor F. Beato, with Historical and Descriptive Notes, Compiled from Authentic Sources, and Personal Observations During a Residence of Several Years*, consists of two volumes containing respectively 101 untinted views and 100 hand-tinted genre subjects. As the title suggests, a lengthy printed caption accompanied each print, attesting to the album's instructive

function at a time of few first-hand, European-language accounts of Japan. Beato not only established the range of typical subjects and practices followed by his successors, but also trained several leading photographers of the next generation, most notably Kusakabe Kimbei and Baron Raimund von Stillfried. Although the studio of *F. Beato & Co.*, located at No. 17 on the Bund, continued to operate from 1869 until 1877, Beato's own photographic activities declined as he delegated further responsibility for the studio's operations to his assistants. Nonetheless, he accompanied the American naval expedition to Korea as official photographer in mid-1871, and, despite the meteoric rise of Baron von Stillfried and other competitors, continued to maintain a high professional reputation. The traveller Elizabeth Amy Cathcart Payne could still note in her diary on 8 November 1874: "We also had our photos taken by Beato, accounted the best photographer in Japan." (Connie Keat (editor), *Amy's Diaries: The Travel Notes of Elizabeth Amy Cathcart Payne, 1869–1875,* Morwell, Australia, 1995, 52.)

Yet aside from such occasional photographic activities, Beato was increasingly preoccupied after 1869 with other financial projects, culminating in the sale of his studio and inventory to *Stillfried & Andersen* in January 1877. A popular resident known for his eccentric personality, Beato enjoyed the local horse races, game shooting, and other social pastimes of treaty port life. During a brief visit to London, he continued to move in Yokohama circles, dining with "quite a Japanese party" of former residents on 5 November 1871 (Schmidt, p.200). He was one of several financiers responsible for establishing the Grand Hotel in Yokohama and was regularly caricatured in Wirgman's illustrated magazine the *Japan Punch.* In December 1875, Beato's ambitions expanded to the opening of a general store at No. 57, Yokohama. According to the *Japan Herald*, this venture epitomised his entrepreneurial spirit:

> Obedient to the command of the new lessee, Mr. F. Beato, a small army of carpenters took possession, and in a few weeks, some four in all, had raised a new edifice… and now, in all the glare of bright paint and paper, the new premises assert themselves to every passer-by as the depôt of the "Yokohama Trading Company," where everything, we are told by the enterprising proprietor, from a gimlet to a bedstead, from a bottle of gin to a hogshead of claret, can be had for about half nothing, or for even less, rather than lose a customer... [Mr. Beato's] wonderful energy, and his elasticity of spirit in these dull times, are calculated to ensure success. He deserves it. (*Japan Herald Mail Summary,* 30 December 1875, p.3)

Success, however, remained elusive. In the end, he lost all his money speculating on the Yokohama silver exchange, and left Japan on 29 November 1884 with his passage paid by friends. While such merchant activities deflected his attention from the studio, Beato made an enduring contribution to photography in Japan, establishing the benchmark in terms of production standards and themes for subsequent studios.

Five months after his departure from Japan, Beato was again employed as an expedition photographer accompanying General Wolseley's British campaign to the Sudan. Although he exhibited the photographs in February 1886 before members of the *London and Provincial Photographic Association,* these Sudan photographs have yet to be identified. At a subsequent meeting of this society on 4 March 1886, the secretary announced that "Signor Beatto ... had unexpectedly to leave England for Burmah on the first of this month." (*British Journal of Photography,* 12 March 1886, p. 167) While the exact date of Beato's arrival in Burma remains conjectural, his prompt departure and expressed destination suggests that he probably settled there before the end of the year. The travel account of George Bird supports this supposition, affirming that Beato "arrived in Mandalay in 1886." (Singer, p. 98) He soon established a successful studio marketing architectural views, genre subjects, and other Burmese subjects that furnished the illustrations for several turn-of-the-century travel accounts. From 1895, the Mandalay studio expanded into an emporium of Burmese curios, with a branch office at Rangoon offering ivory carvings, silverware, and other regional merchandise to tourists and an international 'mail-order' clientele. Beato's various enterprises in Rangoon and Mandalay continued to prosper into the early twentieth century, until his final documented listing in *Thacker's Indian Directory* in 1908. He is thought to have died in Burma about 1908.

Luke Gartlan

Biography

Despite extensive research in recent decades, the birth and death details of Felice Beato continue to elude scholars. Current research indicates he was born on Corfu about 1834 and first trained as an assistant photographer to his brother-in-law James Robertson in the mid-1850s in Constantinople (now Istanbul). From 1855, he was active at the Crimean War and thereafter visited Malta, Jerusalem, and Egypt, before embarking for Calcutta in early 1858. Closely associated with the British military class, he recorded several colonial conflicts including the aftermath of the Sepoy Rebellion in India (1858) and the Anglo-French campaign in Northern China (1860). In the following years, he returned to war photography joining the military campaigns to Shimonoseki, Japan (1864), Korea (1871), Sudan (1885) and Burma (1886). An accomplished topographical and architectural photographer, excelling in multi-part panoramas, Beato also had a formative role in establishing the scenic 'view,' as

well as the street and studio-based 'costumes' of early Japanese photography. In later life, he produced a similar portfolio of photographs during an equally lengthy residence in Burma, where he possibly died around 1908. For over fifty years into the early twentieth century, Beato's photographs of Asia constituted the standard imagery of travel diaries, illustrated newspapers, and other published accounts, and thus helped shape 'Western' notions of several Asian societies.

See Also: Beato, Antonio; Robertson, James; Gardner, Alexander; Fenton, Roger; von Stillfried und Ratenitz, Baron Raimund; and Kusakabe Kimbei.

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BÉCHARD, HENRI AND ÉMILE, AND DÉLIÉ, HIPPLOYTE (active 1869–1880s)

French, commercial photographers

Henri Béchard operated a photographic studio in Cairo in the Ezbekiah Garden district from which he sold rather standard tourist views, as well as a series of types and costume studies. In 1888 he published with A. Palmiere, a set of photogravures, "L'Égypte et la Nubie." Émile Bechard, assumed to be related to Henri, formed a studio with Hipployte Délié. Prior to coming to Cairo—no doubt attracted by the influx of visitors and potential customers at the time of the opening of the Suez Canal, which also coincided with the first package tourist trips to Egypt—Délié had worked supplying travel views for wood engravings for *Le Tour du Monde*. Délié et Bechard had the photographic concession at the Cairo antiquities museum and produced the handsome *Album du Musée Boulaq: Photographie par Délié et Béchard, avec texte explicatif par Auguste Marriette Bey* (Cairo, 1872). The partnership was dissolved sometime after publication and both continued to work in Egypt as commercial photographers. Both received medals at the 1878 Paris Universal Exposition.

KATHLEEN HOWE

BECQUEREL, ALEXANDRE EDMOND (1820–1891)

French scientist and physicist

Becquerel was born in 1820 and is known for his studies in light, photochemistry, and phosphorescence. In the field of photography his main contribution is in color recording experiments. Before describing his work in the field of photography, it is necessary to mention the research in color recording performed before Becquerel. After the invention of black-and-white photography a lot of research was devoted to the possibility of recording natural color images. Even before photography was invented, Johann Wolfgang von Goethe published a book on light and color (Zur Farbenlehre), in which light and color recordings were discussed. Experiments performed by Johann Thomas Seebeck (1770–1831) was included as an appendix in Goethe's book and is probably the first (about 1810) contribution to color photography. Seebeck made experiments in which solar spectra were projected onto silver-chloride impregnated paper. The recording which unfortunately could not be preserved (fixed) showed colors which were induced by the different colors of the solar spectrum. The philosophical explanation of this was: "light chose to impress itself on material objects in its own colours." Thus, it makes sense to describe such a process a *natural* color-recording technique. To some extent Becquerel's

color photography experiments were also based on Sir John Herschel's systematic investigation of solar spectra recorded in silver-chloride impregnated paper. This type of photographic recording technique is often referred to as *heliochromy* (sun-coloring) and the images as *heliochromes*.

Instead of using paper as the material substrate, Becquerel coated a silver subchloride (Ag_2Cl) emulsion on a polished silver plate. Actually, Becquerel preferred chlorination by a galvanic process. The silver plate was immersed as the positive pole in a weak (1:8) hydrochloric acid, the negative pole being a platinum sheet. Within a few minutes the process was completed. By timing the process, he could accurately control the thickness of the layer. The best colors were obtained when the galvanic process was stopped at the "fourth-order violet" which corresponded to a thickness of 1/588 mm. Employing such plates, the colors of the recorded solar spectrum were much brighter than previously recorded spectra. However, the same problem of fixing the images remained unsolved, and despite trying hard, Becquerel could not find a solution. The images faded rapidly under daylight illumination. They had to be stored in complete darkness. In addition to solar spectra recorded in 1848, Becquerel succeeded also in recording color photographs of objects. He recorded some colored engravings and brightly dressed dolls which all required between ten and twelve hours exposure in bright sunlight. For example, at the 1855 Exposition Universelle in Paris, such color photographs were on display in an almost dark tent to preserve the photographs as long as possible. The only light inside was a single candlelight.

Lord Rayleigh (1842–1919) suggested in 1887 that the images obtained in the Becquerel experiment could be explained in this way: "The various parts of the film of subchloride of silver with which the metal is coated may be conceived to be subjected, during exposure, to *stationary* luminous waves of nearly definite wavelength, the effect of which might be to impress upon the substance a periodic structure recurring at intervals equal to *half* the wave-length of the light." Then the recording technique is: "to produce just such a modification of the film as would cause it to reflect most copiously that particular kind of light." In 1889 Otto Wiener (1862–1927) investigated and explained the experiments by Seebeck and Becquerel as well as interferential color photography invented in 1891 by Gabriel Lippmann (1845–1921). The colors observed in the experiments are obtained in two ways: caused by *interference* or by *absorption and bleach-out* process. Becquerel's process may, to some extent, be based on interference, but is much more similar to color recordings on chloride paper. In this case a chemical bleaching process of pigments is behind the colors. The light-sensitive substances are bleached out only by those kinds of light which they absorb, while they are not destroyed by light of their own color. One of Becquerel's solar spectra recorded in 1848 has been preserved and belongs to the collection of the Musée national des techniques (Conservatoire national des arts and métiers) in Paris. It is stored in complete darkness in a box. It is very difficult to get permission to view the photograph. Only on a few occasions have researchers been able to view and investigate the recorded spectrum. However, ordinary photographic color prints exist of Becquerel's photograph; for example, a photo is reproduced on page 29 in *Histoire mondiale de la photographie en colours*, a book by Roger Bellone and Luc Fellot published in 1981.

Hans I. Bjelkhagen

Biography

Alexandre Edmond Becquerel was born in 1820, the son of Antoine César Becquerel who was a pioneer in electrochemical science. Alexandre Edmond's son Antoine Henri was the famous scientist who discovered radioactivity in 1896 for which he shared the Nobel Prize in Physics in 1903. Alexandre Edmond is known for his studies in light, photochemistry, and phosphorescence. For example, he is the inventor of the phosphoroscope. Alexandre Edmond discovered the photovoltaic effect in 1830. Doctor of Science in 1840 and professor of Physics at the Conservatoire national des arts and métiers (National Academy of Arts and Trade) in 1852. When his father died in 1878, he succeeded him as a professor at the Muséum d'Histoire naturelle (Museum of Natural History) in Paris. He is the author of the book: *La Lumière ses causes et ses effets,* published in 1868. In the field of photography he is known mainly for his work in color recording experiments. He died in 1891.

See Also: Herschel, Sir John Frederick William; and Lippmann, Gabriel.

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BEDE, CUTHBERT (1827–1889)

English writer and illustrator who satirized photography

Cuthbert Bede was the pseudonym of Edward Bradley, an English clergyman who, as a writer and illustrator, explored the comic possibilities of photography. It is known that in the 1850s he also took photographs although the extent of this activity is uncertain and no surviving photographs can be reliably authenticated as his. Unless more evidence comes to light, Bede's importance to the history of photography rests principally on his book *Photographic Pleasures: Popularly Portrayed with Pen and Pencil* published in January 1855 and his allusions to photography in *The Adventures of Mr Verdant Green, an Oxford Freshman* which dates from 1853, and which subsequently spawned two sequels.

Edward Bradley was born in Kidderminster in the County of Worcestershire, England, on 25th March 1827. The son of a surgeon, he was educated at Kidderminster Grammar School and at University College, Durham, Northumberland. He obtained his Licentiate in Theology and then went on to take holy orders. He invented his pseudonym by combining Saint Cuthbert and the Venerable Bede whilst still an undergraduate student. In common with many contemporary and near contemporary literary satirists such as Thomas Love Peacock, the youthful Bede began with poetry and prose writing for the periodical press, including *Bentley's Miscellany* and *Punch,* before turning to book publications. 'The Wanton Sunbeam' of 1847 is an example which indicates Bede's incipient interest in photography. It took Bede some time to realise that his talent lay in combining his comic prose with his own humorous illustrations. However before this point was reached, Bede had begun work on one of the first commercially produced Christmas cards, and on an early example of a double acrostic crossword, the later subsequently appearing in *The Illustrated London News* in 1856. He was later to return to verse again in, for example, *Funny Figures* of 1858, a book for children.

In terms of the development of his ideas, it is likely that Bede would have known William Makepeace Thackeray's character Michael Angelo Titmarsh, a parody of 'the artist connoisseur' which first appeared in *Fraser's Magazine* in 1838, which itself was modelled on Thomas Rowlandson's Doctor Syntax, an open parody of the champion of the picturesque, William Gilpin. Titmarsh is similar in many respects to the caricatured 'photographer' that Bede went on to create in *Photographic Pleasures*. Bede met George Cruickshank, the pre-eminent graphic satirist of the period in 1853 and the latter recommended that Bede produce something similar to his own *Adventures of Mr Lambkin: or the Batchelor's Own Book*. It is significant that following the publication of *Photographic Pleasures*, Bede was to be compared to Cruickshank as well as to Richard Doyle and John Leech. Bede also collaborated with Albert Smith of *Christopher Tadpole* fame and with Alfred Crowquill (Alfred Henry Forrester) who provided the illustrations to Bede's 1864 book *Fairy Fables*.

Bede soon found himself with two quite different professional lives, that of his religious calling and that of his work as an increasingly successful satirist. His first curacy was in Glatton-with-Holme in Huntingdonshire which commenced on 17th November 1850. A further curacy followed at Leigh, Worcestershire and he married Harriet Hancocks from nearby Wolverley in 1858. By this time he was vicar at Bobbington, Staffordshire and went on to become rector at Denton-with-Caldecote in Huntingdonshire (now part of Cambridgeshire) and rector of St Nicholas in Stretton in Rutland. After his death on 12th December 1889, he was buried in Stretton churchyard. He had two sons who grew to maturity, one of whom, Charles Bradley, wrote and illustrated mostly on sporting subjects. During his time at Stretton, Bede became heavily involved with antiquarianism and with congregational obligations including fundraising for church restoration and various educational projects. His gained his last living at Lenton in Lincolnshire in 1883.

The Adventures of Mr Verdant Green, An Oxford Freshman, a 'town and gown' story which appears to have been drawn from Bede's own experience at Durham and possibly from time residing in Oxford, was originally intended for serial publication in *Punch*. Nothing came of this and Bede suffered further disappointment when it was first accepted by the *Illustrated London News* and then dropped. By 1853 the story was completed and had been taken up by Nathaniel Cooke who marketed it as a railway novel. It employs photography in the narration, principally in the form of Miss Bouncer, a typical Bede play on words as she was much inclined to *embonpoin*t. Miss Bouncer, an exponent of the "fascinating art of photography" is depicted in one of Bede's illustrations calotyping Mr Verdant Green. Indifferent to Miss Bouncer, he preferred Miss Honeywood, in whose eyes he saw "little daguerreotypes of himself."

The first and second editions of this volume, though not subsequent editions, appeared with a portrait frontispiece of its author adapted from a photograph

taken by Oscar Gustav Rejlander and engraved by Sir John Gilbert. Bede met Rejlander in the early 1850s through a mutual friend William Parke, a Wolverhampton bookseller and printer. Rejlander was the unmistakeable model for the Swedish photographer in Bede's *Photographic Pleasures*. Other friends also found their way into the book including Hussey Pache, who inspired the creation of the young woman with chemically stained fingers in Bede's illustration 'A Photographic Positive.' Hussey Pache was the niece of John Moyer Heathcote, who was then living at Conington Castle, Huntingdonshire. Along with the amateur photographer Captain Grenville Wells, Heathcote became interested in photography in the early 1850s and Bede appears to have learnt how to take photographs in their company. Heathcote was satirised under a photographer's focusing cloth in Bede's 'The Present Attitude to Photography.' Bede may have produced his own photographs for *Glencreggan* of 1861 but by 1864 he had turned to John Thomson, a Scottish landscape photographer, to provide the plates for *Rosslyn and Hawthorden*.

Thomas McLean first published *Photographic Pleasures* in 1855 priced at 7s.6d. In 1859 it passed to John Camden Hotten and by 1863 Day & Son published it at a cover price of one shilling. An example of the book's topicality is its allusion to the Talbot v. Laroche patent infringement case. However not all of Bede's references are credible in that he misspelt Thomas Wedgwood's name and credited Daguerre with fixing his photographs on paper with nitrate of silver. Although Bede's familiarity with photography may have been relatively superficial, his sense of humour and comic timing were well judged. He left behind a body of work that satirised but never maligned what at the time were seen to be the manifest absurdities of photography.

Janice Hart

Biography

Cuthbert Bede was the pseudonym of Edward Bradley, born on 25th March 1827 in Kidderminster, Worcestershire, England. He created his pseudonym from the names Saint Cuthbert and the Venerable Bede. A comic writer and illustrator he pursued these interests alongside the obligations of his religious calling. He led a number of congregations, advancing from curate, to vicar to rector in small to medium sized, and often ancient and beautiful, orthodox churches. His best known works are *The Adventures of Mr Verdant Green, an Oxford Freshman* published in 1853 and *Photographic Pleasures: Popularly Portrayed with Pen and Pencil* which appeared in late January 1855. He was advised by George Cruickshank, collaborated with Alfred Smith and knew a great many of the literary men and illustrators of the period. He appears to have learnt photography with the amateur enthusiasts John Moyer Heathcote and Captain Grenville Wells and also met a number of professional photographers including John Thomson and Oscar Gustav Rejlander. *Photographic Pleasures*, his most sustained satire of photography, is a mixture of acute observations and unintended errors, the later indicating that Bede's grasp of photography was relatively slight. However Bede did bring humour to what were thought of at the time as photography's most absurd and therefore entertaining characteristics. He died on 12th December 1889.

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BEDFORD, FRANCIS (1816–1894)

British photographer, artist, lithographer, and publisher

Francis Bedford was as accomplished with watercolours, lithography and architectural drawings as he was with photography. As an architectural and landscape photographer, his achievements rank alongside those of Roger Fenton and Francis Frith.

Throughout the 1840s, with a growing reputation for ecclesiastical architectural drawing and his established talent as a lithographer, he was commissioned to illustrate a number of projects, including *A Chart Illustrating the Architecture of Westminster Abbey* (1840), *A Chart of Anglican Church Architecture Arranged Chronologically with Examples of Different Styles* (1843) and *The Church of York* (1843).

In 1851 he produced 158 chromolithographs for Digby Wyatt's *Industrial Arts of the Nineteenth Century, at the Great Exhibition 1851* which was published over the following two years. Other lithographic commissions included 100 plates for Owen Jones' *The Grammar of Ornament* (1856), and *The Treasury of Ornamental Art* (1858). For the latter, and for *Art Treasures in the United Kingdom* (1858), the lithographs were "drawn on stone" from Bedford's own photographs.

Bedford, Francis. The Waterslide, Badgworthy. *The Metropolitan Museum of Art, The Elisha Whittelsy Collection, The Elisha Wittelsey Fund, 1973 (1973.502.6) Image © The Metropolitan Museum of Art.*

He likely entered professional photography in 1851 or 1852. In his obituary in *The Bookseller* in 1894, it was suggested that this change of direction was at the suggestion of his publishers Day & Son, who may have seen the value in having a foothold in the emerging photographic market.

In 1851 Bedford moved to 326 Camden Road, London, which would be the base for the photographic business until his death in 1894. By 1853 he had exhibited photographs for the first time—copies of Middle East lithographs by the artist, David Roberts. The photography of art objects occupied much of his early career—interiors of Marlborough House, and reproductions of work from the Royal Collection for Queen Victoria being significant early commissions.

Like many architectural and landscape photographers of his day, Bedford's early images were taken with a large format camera—his 12 × 10 prints attracting considerable praise in the photographic press. Later images were typically also produced in *carte-de-visite* and stereoscopic formats. Examples of his photography appeared in *The Photographic Album* of 1855, with views in North Wales appearing in the second volume the following year.

A further commission from the Queen—to take views of Coburg for her to present to Prince Albert—came in 1857, the year he joined the Photographic Society of London, and in the following year, his enthusiasm for architecture photography resulted in a set of his images becoming part of the collection of the Architectural Photography Association. Examples of his work were published in *The Sunbeam*, edited by Philip H. Delamotte—first published in six parts between 1857–59 and as a single volume in 1859—alongside such contemporaries as Delamotte, Fenton, and Joseph Cundall.

He was elected to the Council of the Photographic Society in 1858, and became Vice-President in 1861, before which time he had entered commercial photographic publishing, with his series of stereoscopic cards, *Chester and North Wales Illustrated*. Further series on Somerset, Devon, Stratford-on-Avon and other areas of central England, western England and Wales followed regularly over the following years, printed in his large printing works adjacent to 326 Camden Road, and published in Chester by Catherall & Pritchard.

While photographers like Roger Fenton and Francis Frith eschewed the low cost *carte-de-visite* print, the introduction of the carte era was enthusiastically embraced by Bedford, and saw many of the subjects which had already proved successful with both the large format camera and the stereoscope being republished as cartes. Extensive series of carte-de-visite prints, often from cropped-down stereoscopic images, were available throughout the 1860s, all bearing the legend "F. Bedford Photographer to H. R. H. The Prince of Wales" over the Prince's coat of arms.

By the mid 1860s, Bedford's catalogue ran to over 9000 images in a variety of formats, including multiple-view cartes-de-visite, copied from montages of large format views. Over 10% of his published output was of Welsh subjects, and the majority of his work was produced in Wales and the west of England—perhaps surprising for a photographer who was so firmly based in London. He had a virtual monopoly of stereoscopic views of Bath, Bristol, Warwickshire, North Wales and Cheshire, and series of *carte-de-visites* of the came

locations. The quality of the interior views available as cartes rivals the very best in large format views.

A significant boost to his reputation came with the commission to accompany the Prince of Wales, later King Edward VII, on a trip to Egypt and the Holy Land in the spring and early summer of 1862. The resulting images were exhibited in London in July 1862, and published in four volumes by Day & Son in 1863. Selections from Bedford's Middle Eastern views were included in *The Stones of Palestine* (1865) and *The Holy Land, Egypt, Constantinople, Athens &c* (1866).

Bedford was an accomplished manipulator of his images, and many of his surviving negatives show evidence of that manipulation. Skies painted out to be replaced by clouds printed from separate negatives, areas darkened in the negative by application of tissue paper to lighten the print, and extensive work with the pencil and the brush, are all devices Bedford used to ensure that perfect prints were produced from often imperfect negatives. In an essay on landscape photography published in the 1867 *Yearbook of Photography and Photographic News Almanac* he wrote of further tricks—including pruning foliage and tying plants back on windy days

> If, however, the wind, our greatest foe, proves too much for us, even then there is good work to be done. There are often magnificent cloud effects at such times, and if the photographer will set to work upon them, he may obtain a stock of such cloud negatives as will serve to convert comparatively uninteresting views into perfect pictures. (Bedford, "Landscape Photography and its Trials" in *The Philadelphia Photographer* v.XIII, No.148, 1876)

Prior to 1880, Francis Bedford retired from photography and passed the business to his son William who died in 1893. Bedford himself died the following year.

A major collection of Bedford's negatives and contemporary prints is held by the Central Library, Birmingham, England.

John Hannavy

Biography

Francis Bedford was born in London in 1816, the eldest son of the architect Francis Octavius Bedford. He studied art and architecture from an early age, and first exhibited at the Royal Academy in 1833 when he was only 17, and exhibited annually from 1844 until 1849.

He devoted the early part of his career to lithography and chromolithography, his work being published widely. Turning to photography in 1851 or 1852, he quickly earned a reputation as one of the finest architectural and landscape photographers of his day. An early and enthusiastic member of both the North London Photographic Association, and the Photographic Society of London, on the Council of which he served for many years, and as Vice President twice, being elected in 1861, and again in 1878. Little is known of his private life except that he had one son, William born 1846, who later joined him in the photographic business. After Francis's semi-retirement from professional photography in the 1870s, William ran the business until his death in 1893 at the age of 47. Francis Bedford died the following year, 1894.

See Also: Fenton, Roger; Frith, Francis; Victoria, Queen and Albert, Prince Consort; and Cartes-de-Visite.

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BEERE, DANIEL MANDERS (1822–1909)

Professional photographer

Daniel Manders Beere (1822–1909) came to New Zealand in 1863 where he was employed as a surveyor for the Auckland Provincial Government. During the Maori Land Wars (1863–1872), he enlisted with the militia and served not only in his professional capacity but as a photographer, supplying photographic prints for his friends and colleagues in the field. Many of these survive today in family albums. It seems he arrived in New Zealand proficient in the use of the collodion method of photography. It is thought he acquired this knowledge in Canada where he took part in the Assiniboine and Saskatchewan Expedition of 1858. He used his photography to record the terrain of where a supply road was being put through heavily forested countryside to supply the colonial forces in the Waikato. This area was noted for frequent skirmishes and ambushes by the Maori forces. One of his most striking images from this period is a staged reenactment of the Maori War party advancing across an open piece of ground with clubs and hatches held at the ready! More common are his studies of settlers posed in front of their cottages. His

name is commemorated to this day with a suburb called Beerscourt in the city of Hamilton.

William Main

BEHLES, EDMUND (1841–1921)

Italian photographer and studio owner

Edmund Behles was born in Stuttgart on 21st July 1841. He was married to Luisa Fetzer. First he worked as a photographer in Rome with Giorgio Sommer from1859 to 1860, becoming the most brilliant and qualified photographer in Sommer's firm. Their association lasted until about 1866. During this period they often sold photographs under the name of either of them without distinction or with both their names together. This makes the attribution of these early photographs very difficult. During their collaboration, Behles and Sommer travelled all over Italy and became famous for their photographic views of important monuments and landscapes in enlarged and stereoscopic prints. When Sommer went to Naples, Behles remained in Rome and worked independently until 1878 in Via Mario de' Fiori, 28. He also had a shop in Via del Corso, 196. He became well known for portraits, while continuing to take photographs of landscapes and historical sites. He won prizes at international exhibitions with Sommer (Dublin 1865), with whom he was honoured by Vittorio Emanuele II as Royal Photographer (1865). He also won prizes on his own (Paris 1867; Vienna 1873), continued his activity as a photographer until about 1890. Edmund Behles died in Rome on 21 November 1921.

Silvia Paoli

BELGIUM

The creation of the Belgian state in 1830 and the invention of photography were virtually synchronous. The country's specific cultural and geographical context made it fertile ground for the new medium to take root. An initially politically fragile buffer state on France's northeastern flank, Belgium could only thrive by a policy of free trade and open borders, to achieve emancipation, both economically and culturally, from its larger southern neighbour. This factor contributed to making Belgian society relatively receptive to innovations such as photography, and ready to exploit its applications, for instance to the printing press. Furthermore, Belgium was the second European power after Great Britain to undergo the deep cultural change which is labelled the Industrial Revolution. The resultant consolidation of a large middle class fostered the diffusion of photography both as a leisure pursuit and as an autonomous economic activity.

The first phase in the socialisation of the new technology was the experimental or laboratory phase. This is the period in which the inventor or his representative hoped to market the invention, without fully meeting the two preconditions of viability and market need. In Belgium, the first phase of socialisation lasted from the announcement of the invention of photography in January 1839 until the spring of 1842.

The figure who best characterises this phase is the printer, lithographer, journalist and polemicist Jean Baptiste Jobard (1792–1861). While not exactly a representative of Daguerre, he had several meetings with him in Paris that year, and purchased a camera from Isidore Niépce, son of the inventor. On 17 September 1839, he announced in the columns of his own newspaper *Le Courrier belge* that he had succeeded in taking the first photograph in Belgium—a seven-minute exposure from the window of his Brussels town house. Jobard also informed his readers that he had set up a company, the Societe belge du Daguerrotype, and that "the firm will send on site artists versed in selecting the most suitable viewpoints for monuments, mansions or factories or machines to be copied, while awaiting [the possibility] of portraits from life" (*Le Courrier belge*, 12 September 1839). But Jobard's initiative was stillborn. It was not that he had failed to grasp the potential of the new technology; rather that it had not yet attained viability. Later on in the year, still possessed by the spirit of utopian ambition, Jobard foresaw the application of photography to the printing press: "We declare that before another six months have passed, daguerreotype plates will be engraved for print-runs of thousands," (*Le Courrier belge*, 25 September 1839). He was wrong of course, but it should be remembered that, in common with many of the pioneers of the new medium, he was a lithographer by training. His predilection for photography, like Nicéphore Niépce**'s** motivation for inventing it, sprang from a search for a technical aid to the graphic arts, a means of raising productivity by replicating handmade objects (lithographs and engravings) in block printing. The printing press would indeed provide a major application for photography—but not yet. Jobard's fate was typical of many such precursors in that he was defeated by a new and untried technology.

By the time the second phase of socialisation was initiated, the visionary had given way to the commercial. This second phase can be defined as a period when financial incentives and the assistance of entrepreneurs, willing to shoulder the risk of commercialisation, enabled the medium to become truly viable. In Belgium, the onset of this phase can be dated precisely to the second week of March 1842, when all of the financial and technological factors finally fell into place with the opening of the first two portrait studios in Brussels. In portraiture, photography found or created the well-defined consumer need prerequisite for its success. The

technical viability was secured to a great extent by British entrepreneur Richard Beard. While Beard could not patent photography per se, he acquired rights on a series of modifications and improvements which constituted a new production process. His agent took out the first Belgian patent in photography on 23 February 1841 for "an improved apparatus for transferring drawings and natural objects to metallic surfaces prepared by an improved process." The improved process consisted of the use of bromine and iodine in equal parts, combined with a description of the lay-out of a portrait studio employing a Wolcott mirror camera, referred to in the patent as "the reflecting apparatus."

A year after taking out his Belgian patent, Beard advertised the "Photographic portrait establishment of the Royal Polytechnic Institution of London, and at the Bazar Pantechnique, near the Park in Brussels. The photographic process for making portraits is an improvement of Monsieur Daguerre's method. Mr Richard Beard has just obtained a patent for Belgium. Portraits taken by this method require several seconds of exposure only and possess a softness and a delicacy which can only be obtained by the process of Monsieur Daguerre." *(Journal de Bruxelles*, 11 March 1842). Beard's operator, an Englishman by the name of Billing, immediately faced competition from the locally established firm of opticians, the Brand brothers, and from Vanmalderen in Liège. It is not known how long the Beard studio operated but the small format of the plate which the Wolcott mirror camera was capable of holding must have finally told against him. Beard never managed to institute in Belgium the franchising system which had been so successful in England. A risk-taker by nature, he was ultimately to bankrupt himself. At least Beard had demonstrated the commercial possibilities of the new technology, but it was left to other individuals, with firmer roots in the local marketplace, to see photography through the next phase.

This third phase in the timetable of photography's socialisation may be summed up as the period when invention becomes innovation. The technology was now being used more widely and demand for it began to grow. In Belgium, this phase lasted about fifteen years—from 1846 (when the first permanent portrait studios were operational in the major towns) until 1860. During this time, the practice of photography, concentrated almost exclusively in the hands of professionals, was characterised by two distinct methods of exploitation. In the larger centres of population—Brussels, Liège, Antwerp and Ghent—permanent portrait studios were erected. Outlying districts and smaller towns were served by short-stay itinerant photographers who would usually operate in a hotel courtyard or garden. The town of Tournai offers a typical case study. Travelling daguerreotypists were recorded as visiting the town in 1843 (Mr Guyard and one anonymous itinerant), 1844 (Messrs Guyard and Housselot), 1848 (Edouard) followed by a certain Dondez "Professeur de daguerréotype" periodically between 1852 and 1857. The first permanent professional photographers in Tournai, Lefebvre-Midavaine and Louis Duchâtel, began operating in 1853 and 1855 respectively.

In phase three of the photography's take-up, the medium cannot yet be considered as economically significant in Belgium. A handful of full-time practitioners, supplemented by their itinerant colleagues, had little economic impact. There was no great reservoir of well-heeled amateurs, eager to drive the innovation process, as in Great Britain and France, so that Chevalier Dubois de Nehaut and Edmond Fierlants had to look to Paris for intellectual stimulus. In the Belgian population census of 1856 (the first time that photography is mentioned), the term "photographer" is not autonomous but subsumed into a miscellaneous list allied to the printing trade, comprising "playing cards, cardboard, wax and signets, pencil manufacturers, illuminators, photographers, manufacturers of printers' ink, fount makers, type and other engravers." The concern of the Belgian authorities at the laggardly nature of take-up found concrete form in a willingness to support individual initiatives in the domain, by Guillaume Claine and Edmond Fierlants, especially when these initiatives could be linked to a reformulation of the new state's cultural heritage. A similar preoccupation underlay the organization of the first two photography exhibitions in Belgium in 1856 and 1857.

The small number of patents taken out in Belgium are an accurate indicator the negligible economic impact of photography until 1860. Thus in the 1840s only nine patents were issued in the domain, rising to 55 in the 1850s. There is a clear jump in the 1860s to a level of between 10 and 20 per year, a range which remained constant well into the 1880s. The origin of individual patents also reveals the position of Belgium in the matter of technology transfer. As might be expected, about 90 percent of patents are of foreign origin, typifying Belgium as a "consumer" rather than an "initiator" of technology, and dependent on other countries throughout 19th century. Furthermore, the diffusion of know-how can be inferred from the rate of transfer of patent rights to third parties, a central aspect in acquiring, managing and exploiting new technology. No such transfers were registered in Belgium in the 1840s and 1850s. Photographic technology began to be used by individuals other than the patentee in a modest way from 1860 onwards; the first such case being the transfer of Dutchman Eduard Asser**'s** patent for his photolithographic printing process to the Brussels printers and lithographers Simonau & Toovey, the first photomechanical printing process exploited in Belgium. Previous to this, the only photographic print-

Laurent, Juan and José Martinez Sánchez. Zaragoza à Pamplona y Barcelona—Puente de Zuera.
The Metropolitan Museum of Art, Purchase, The Horace W. Goldsmith Foundation Gift, by exchange, 1999 (1999.138) Image © The Metropolitan Museum of Art.

ing establishment to operate in Belgium was run by Gilbert Radoux (1820–?), a French "proscrit" [political refugee]. A total of five patent transfers were recorded in the 1860s, five in the 1870s, dropping to two in the 1880s before jumping to twenty-two in the final decade of the century.

Successive political upheavals in France enriched the photographic life of the Belgian capital, where refugees tended to congregate. Both Radoux and his successor Charles Neyt (1833–1908) kept up contacts with the exiles from the régime of Napoleon III, cultivating the company of artists and writers who passed through Brussels, such as Gustave Courbet, Victor Hugo, and Charles Baudelaire, all of whom had their portraits taken during their stay. Another frequent visitor to Belgium was Nadar, whose wide circle of friends included Louis Ghémar, his Brussels counterpart as caricaturist, portraitist, and showman. Following the events of the Commune, Gaudenz Marconi, photographer of "académies pour artistes" [nude studies for artists], relocated to Brussels in 1872, where he led a more obscure life. Diffusion of knowledge and technical know-how in the domain was promoted by the handbooks, written in Belgium but published in France, by the prolific researcher Désiré van Monckhoven.

The rise in the number of patents and of transfer rights heralds the onset of phase four of the socialisation process, as society began to accustom itself to the new technology. In Belgium, this sustained take-off ran for some 30 years from 1860. There is enough quantitative as well as qualitative data to confirm the starting date. Quantitatively, we have the census returns: from an estimated 38 persons who exercised the profession of photographer in 1856, the number had risen in 1866 to 256—in other words, a jump of 670 percent. Qualitatively, we have the testimony of contemporary observers, such as this journalist reporting on the construction of a new portrait studio in Brussels in 1864: "Ten years ago, photography was scarcely known here, only Daguerre's system was in vogue and astonished many people. Today portraits on metal plates are quite out of fashion; men of progress have put their minds to it and, aided by chemistry, have managed to reproduce on paper portraits which can be preserved indefinitely. Progress has not

stopped there: to be convinced, you need only consider the number of photographic establishments founded in Brussels alone in the past few years; this is the best proof of vitality in this industrial branch." (*L'Etoile belge*, 16–17 May 1864). A monthly periodical, *Bulletin belge de la Photographie*, appeared from 1862 to 1880, until 1872 with the support of the photographic supply house of Léon Deltenre-Walker (1819–?) in Brussels.

The advent of the fourth phase was made possible by the huge and virtually instantaneous popularity of the carte-de-visite, introduced as a novelty in the autumn of 1859, which, only a year later, had achieved universal acceptance in portrait studios throughout the country. The card portrait, aimed at the middle-class consumer, proved to be an extraordinary marketing phenomenon in Belgium as elsewhere, the motor which would secure for photography its position as an autonomous economic activity. The bread-and-butter work of the portrait studio allowed a small number of firms, some with a strong regional identity, to expand their operations and sustain a reputation over several decades. They include Louis Ghémar in Brussels, Joseph Maes in Antwerp, and Armand Dandoy in Namur, young men dynamic enough to seize the opportunities which the new medium offered in other areas, and sufficiently affable to flatter and retain the bourgeois clientele of their bedrock portraiture business.

A phenomenon typical of professional photography during this phase in Belgium is geographic clustering. Brussels, as capital city, was the pole of attraction. During the period 1860 to 1890, about a third of all portrait photographers in Belgium were to be found in a relatively small area of Brussels. Data aggregated from trade directories emphasises the level of concentration. In 1860, Brussels had 23 out of 36 studios in the whole of Belgium. By 1868, this had risen to 49 out of 127. While there was a shake-out in the 1870s in Brussels, due to economic downturn, the major cities of Liège, Antwerp and Ghent came nowhere near to catching up. By 1888, Brussels still had three times as many studios as Antwerp—72 to 25. Seen per head of population, the position of Brussels is just as predominant: in 1866, there was one photographer for every 6000 inhabitants in the capital (the average for the country as a whole was 1 in 19,000). The density ratio of 1:6000 was not reached in Liège and Antwerp until the mid-1890s, and by the country as a whole only after the turn of the century. Brussels, with its concentration of wealth, was therefore the natural environment for what was still very much a luxury commodity.

Concerning the social and professional origins of 19th-century practitioners, professionals were the most diverse—a good minority claimed to be artists and painters, or had previous experience in an allied graphic trade such as lithography or engraving. Many of the daguerreotypists had a solid grounding in optics and mechanics. But the majority of men entering the profession during the period covered were artisans, skilled craftsmen with previous experience in a quite unrelated field. Their continued presence in the domain depended not just on their manual skill, but on an ability to run a small business. For many, photography was only one activity within a lifetime of varying activities, and the average life of a studio in Brussels up until 1900 was little more than five years. Success was also partly a function of geographic distribution: the best known and most successful establishments tended to be situated along the central and more fashionable streets in the main towns, while photographers in other locations lived a more precarious existence. The profession was overwhelmingly male, with some widows or single women (often daughters of photographers) active as studio head, while others worked as colourists and retouchers.

The fifth phase of photography's socialisation was a quantitative leap. The technology experienced a wide social and geographic dissemination, and was incorporated into everyday life. In Belgium, this point was reached around 1890, as professional photographers began to open studios in working-class suburbs and in country areas. The number of patents registered rose from 251 in the 1880s to 592 over the following decade. In parallel, the penetration of the medium as a leisure activity reached new levels, thanks to the successful marketing of Kodak cameras and film. The early 1890s saw the formation of local amateur groups, but also led to a fragmentation of attitudes. The last unified photographic exhibition in Belgium, covering equipment and images of all sorts, was organised by the Association belge de Photographie in 1891. Thereafter equipment could only be seen at industrial fairs, and exhibitions were either for all-comers or the pictorialist elite.

In fact, pictorialist trends developed rapidly in Belgium, as leading amateurs (and a few professionals) broke with artistic conformity, asserting a recognisably individual aesthetic vision in image-making. A prominent presence in the first wave of pictorialism, Léonard Misonne acquired a lasting reputation for landscapes, bucolic and timeless. His images are characterised by a masterly treatment of light and atmospheric conditions, as summed up in the credo "Le sujet n'est rien, la lumière est tout" [The subject is naught, light is all]. Also typical of the new movement was Gustave Marissiaux, whose images of mine workers in the Liège region express a social concern previously absent from Belgium photography.

A main characteristic of the fifth phase of the socialisation process was the broadening of applications, when photography began to be applied to completely fresh areas of human endeavour. When the two major inventions to incorporate photographic technology—

cinematography and Roentgen**'s** X-rays—emerged in the mid-1890s, Belgian photographers were quick to take advantage. The botanist and microphotographer Henri Van Heurck (1858-1909) experimented X-ray photography intensively from January 1896, while the versatile Alexandre [Drains] (1855–1925) exhibited his films of the Tervueren colonial exhibition in 1897. The take-up of both applications was much more rapid in Belgium than for photography itself, due in part to the transformation in infrastructure and economic power which had taken place in the previous 50 years.

Within the photographic branch itself, industrialisation meant the division of labour and a move away from artisan-dominated structures. By 1900 the main business of a number of photographic printers, notably Jean Malvaux of Brussels, was supplying halftone blocks for illustrated magazines, such as *L'Illustration européenne.* The man behind the camera was only one skilled operator on a long process line. The new century dawned with photography catering to a mass market and requiring large scale industrial production of cameras and continuous production of paper and plates. Despite facing stiff competition from foreign imports, some local firms benefited from this scaling-up. They included the Royal Photographic Manufactory of cameramaker Louis Van Neck (1853–1917) and the specialist emulsions and photographic paper plant founded by Lieven Gevaert (1868–1935).

STEVEN F. JOSEPH

See Also: Niépce, Joseph Nicéphore; Beard, Richard; Wolcott, Simon, Alexander and John Johnson; Dubois de Nehaut, Chevalier Louis-Pierre-Theophile; Fierlants, Edmond; Claine, Guillaume; Asser, Eduard Isaac; Courbet, Gustave; Hugo, Charles and François-Victor; Baudelaire, Charles; Nadar; Ghémar, Louis; Marconi, Gaudenzio; van Monckhoven, Désiré Charles Emanuel; Maes, Melchior Florimond Joseph; Dandoy, Armand; Misonne, Leonard; Marissiaux, Gustave; and Roentgen, Wilhelm Conrad.

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BELITSKI, LUDWIG (1830–1902) AND VON MINUTOLI, BARON ALEXANDER (1806–1887)

Ludwig Belitski was born January 15, 1830, in Liegnitz / Silesia. From 1845 to 1847, he visited the city's school for arts and crafts, and in 1848 he was made apprentice to the mechanicus Haertel in Liegnitz. It was there that he started to work as a photographer to Minutoli. In 1854, Belitski moved to the neighbouring town Teplitz to open a photographic studio, and later moved in 1856 to St.Petersburg, and then in 1860, to Hamburg. From late 1862 on, Belitski operated his own studio in Nordhausen/Harz until his death on July 1, 1902. He died as one of the most recognised craft photographers in Germany, having published a large number of articles under his name and being a honory member to a great number of associations.

Alexander Baron von Minutoli was born December 26, 1806, in Berlin. He studied law and economics at the universities of Berlin, Bonn, and Goettingen where he was promoted in 1828. After several years of journeys where he became one of the most effective collectors of antique and historical items. In 1843 he bought the mosaics from the apsis of Santa Michele in Ravenna for the Prussian king. After, he took up state positions from 1835. In 1839 he was made officer for industrial politics in Liegnitz, a position he held until his retirement in 1865 onward. In 1863 he bought a former knight's farm at Friedersdorf on Queis where he lived until his death on December 17, 1887. His private collection of more than 7,200 items formed the basis for the Berlin Museum of Arts and Crafts.

On January 18, 1845, Alexander Baron von Minutoli, a Royal Prussian officer of the Liegnitz area, an industrial district in Lower Silesia, announced the foundation of "a collection of good pattern images for the education of taste" for all industrial branches. In the industrial area, arts and crafts had undergone radical changes towards poverty and only small textile, glass, ceramic, and metal industries survived. Minutoli, himself a noted collector and conoisseur of the arts, had no money to spend on buying quality products of the past years to show to these industries in the hopes that examples of good design for household goods would be helpful. His idea, apparently conceived as early as in 1842, was to collect daguerreotypes of well-known articles in arts and crafts, which he did until the late 1840s. The announcement of 1845 therefore provided an invitation for manufacturers to borrow these daguerreotypes from him.

By the early 1850s, most of the daguerreotypes Minutoli had used, became worn out or destroyed, and some of the original works collected were on the edge of destruction by the borrowers. Minutoli decided to print smaller catalogues after having heard of similar examples by the imprimery of Blanquart-Évrard, and he looked for help with a local mechanic who encouraged his young apprentice, Ludwig Belitski, to take up photography to help with the planned albums. Between 1853 and 1855, no less than 150 photographs were taken and published in large albums, the whole process receiving numerous reviews and wide acclaim. By 1862, Minutoli published another 663 photographs showing no less than 4,000 items but this work was not as successful. Minutoli sold his collections to the Prussian government, and Belitski who had already withdrawn from the project by 1856, never gained copyright for his participation in this first virtual museum of arts and crafts.

ROLF SACHSSE

BELL, WILLIAM (1830–1910)

English-born American photographer

William Bell's extraordinary, sixty-year career as a photographer began in the daguerreotype era and ended well after dry plates and film had transformed the making of photographs, but he is remembered primarily for the work he did as chief photographer for the U.S. Army Medical Museum, 1865–1867, as Timothy O'Sullivan's replacement on the Wheeler Survey in 1872, and as an accomplished practitioner of the dry collodion process. His role as photographer for the U.S. government sponsored 1882 Transit of Venus Expedition to Patagonia is also noteworthy, but is little known, and photographs he made for the Kentucky State Geological Survey in 1884 have never been identified.

William Bell of Philadelphia's life and career differentiate him decisively from Dr. William Abraham Bell, with whom he is often confused and conflated, even in major references, because of the similarity of their names, because they were contemporaries, and because they both photographed in the American West.

William Bell was born in Liverpool, England, and brought to the United States as a young child by his immigrant parents. Orphaned in a cholera epidemic, he was adopted and raised by a Quaker family living outside Philadelphia. Notwithstanding this pacifist upbringing, the 16-year old-Bell enlisted in the Army to fight in the Mexican War. He became a photographer when he returned to Philadelphia from Mexico in 1848 and went to work for his brother-in-law, who owned a daguerreotype studio. Over the next half century Bell was associated with a string of portrait and commercial studios in Philadelphia, either as sole proprietor or as a partner. The relatively few images from any of these studios that are known are notably conventional: Bell's significant work was done in non-commercial arenas.

In 1865, after three year's service as an infantryman in the United States Army during the American Civil War, Bell joined the staff of US Army Medical Museum as its chief photographer, with the rank of Hospital Steward. Founded in 1862, the Army Medical Museum was mandated to advance the study of military medicine and to produce a medical and surgical history of the on-going "War of the Rebellion." The Museum's staff included Dr. Joseph J. Woodward, one of the leading photomicrographists of the era, and photography was considered a vital tool of this mission. From the beginning, the Museum had acquired photographs of war injuries and the results of unusual operations and amputations; during his two years of service with the Museum Bell contributed hundreds of photographs of to its collections, including images of specimens as medical portraits of servicemen who had survived diseases, horrendous wounds, and operations or amputations, which are among the most poignant of American Civil images. Many of these photographs were used as illustrations in the monumental, groundbreaking *Medical and Surgical History of the War of the Rebellion* (1870–1883) and other Army Medical Museum publications—either as tipped-in original albumen prints, sometimes as woodburytypes, collotypes, or photolithographs or other forms of reproduction. In addition to this medical work, Bell took portraits of dignitaries visiting the Army Medical Museum, as well as landscape views of Civil war battlefields, and in April 1865, he and his staff printed some 1500 copies of portraits of the conspirators involved in President Lincoln's assassination for use on wanted posters.

In 1867, Bell returned to Philadelphia and opened his own studio, but in 1872 joined George M. Wheeler's

survey of the territories west of the 100th meridian as a replacement for Timothy O'Sullivan, who had joined a U.S. Navy expedition exploring the Darien Peninsula in Panama. During his single season with the Wheeler Survey, Bell photographed along the Colorado River and the upper reaches of the Grand Canyon in southwestern Utah and northwestern Arizona—well to the west and north of where William Abraham Bell took photographs in 1867. Bell used both the wet and dry collodion processes in the field, and employed two cameras, an 8 × 11 for large views and a 5 × 8 for stereos. In composing his images Bell utilized a distinctive compositional formula that emphasized both the overwhelming scale and the vast spaces of the landscape he encountered. While he made horizontal views (including several multi-plate panoramas), Bell's characteristic Western images are vertical compositions with a strong, dark visual element that parallels the picture plane and dominates the foreground, while the middle ground recedes into the distance in a series of increasingly lighter toned parallel planes. This compositional formula typifies stereoscopic photography, and it yields dramatic and evocative results in Bell's images, while it serves to distinguish them from the work his contemporaries. After the Wheeler Survey, Bell returned to Philadelphia, and in 1875 went into partnership with William Rau, his future son-in-law, who was a noted professional photographer in his own right. Except for his brief stints with the Transit of Venus Expedition in 1882, the Kentucky State Geological Survey in 1884, and a commission from the organizers of the Columbia World's Fair in 1892 to travel around Europe to photograph the paintings being borrowed for exhibition at the Fair in 1893, Bell spent the remainder of his career in Philadelphia, where he was active in the photographic societies and contributed technical articles on the dry plate processes (on which he was considered an expert), as well as memoirs of his experiences to, professional publications, notably *Philadelphia Photographer* and *Photographic Mosiacs*.

William Bell has been overshadowed by his contemporaries, overlooked in most of the influential histories of photography, and confused with William Abraham Bell by many historians. His photographs were included in the albums published by the Wheeler Survey, and they were exhibited in the Vienna Universal Exposition (1873), the Louisville Industrial Exposition in Kentucky (1873), and at the Centennial Exhibition in Philadelphia (1876), but they received little attention. After his death his obituaries noted his military service, his work with the Army Medical Museum and the Wheeler Survey, and his expertise in the dry-plate processes, but only within the past three decades has William Bell begun to receive the recognition due him.

WILL STAPP

See Also: Bell, William Abraham; and O'Sullivan, Timothy.

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BELL, WILLIAM ABRAHAM (1841–1921)

Dr. William Abraham Bell, an English physician who came to the United States in 1867, is significant because of his brief but unsuccessful career as one of the first survey photographers of the American West and because he been conflated with two other William Bells who were his contemporaries: William Bell from Philadelphia (c. 1830–1910), who had a long, varied, and important career as a photographer, and William C. Bell, a minor Washington, DC (later Baltimore, MD) studio photographer (active c. 1860–c. 1880). Dr. William Abraham Bell was active less than six months and was not prolific. His work is extremely rare and seldom seen or reproduced, with the exception of one image. His photograph of the mutilated corpse of Sergeant Wyllyams, a cavalryman killed by Cheyenne Indians near Ft. Wallace, Kansas, is one of the most vivid documents of the horrific nature of the Indian Wars.

William Abraham Bell was the son of a London physician. He was born in Ireland, earned his medical degree from Cambridge University, and practiced at St. George's Hospital in London before leaving for the United States in 1867 to study homeopathic medicine in St. Louis, Missouri. Upon arriving in Philadelphia, however, Bell decided instead to join an expedition organized by the Union Pacific Roadway, Eastern Division (soon renamed the Kansas-Pacific) to determine the best southern rail route from Kansas to California. Through the influence of friends in Philadelphia and the personal recommendation of John Lawrence LeConte (1825–1883), the expedition's geologist, Bell was appointed the expedition's photographer, even though he knew nothing about making photographs. He spent two weeks learning the rudiments of the wet plate process from John C. Browne, editor of *Philadelphia*

Bell, William Abraham. Private George Ruoss.
The Metropolitan Museum of Art, Gilman Collection, Museum Purchase, 2005 (2005.100.99) Image © The Metropolitan Museum of Art.

Photographer, before leaving for Kansas, and Browne put together Bell's photographic outfit—camera equipment, chemicals, plates, darkroom tent, etc.—and shipped it after him.

Bell joined the expedition at its jumping off point, Ft. Wallace, near the Colorado border, in the heart of Indian country, and the focal point of the Indian Wars. Sgt. Wyllyams was killed shortly after Bell's arrival and he photographed the body as it was found. Perhaps because Bell was a physician and unsentimental about death, the image is straightforward and unflinchingly gruesome—Wyllyams' corpse had been stripped, horrifically mutilated, and shot full of arrows. When the photograph was reproduced soon afterwards in *Harper's Weekly* as a sanitized wood-engraving, surprised and dismayed Kansas-Pacific officials saw it as negative publicity and suspected that Bell intended to profit personally from the photographs. They were already dissatisfied with the quality of Bell's work and had hired Alexander Gardner as Chief Photographer for the expedition.

Before Gardner could reach the expedition, however, it left Ft. Wallace, traveled southwest across desert country to New Fort Lyon in southeast Colorado (close to the mouth of the Purgatoire River and near present day Las Animas), where it split into two parties. The northern party to explored south central Colorado, then followed the Rio Grande south to the rendezvous at Ft. Craig in southern New Mexico. The southern party, which included Bell, explored north central New Mexico west to the Rio Grande, then went down the Rio Grande south through Albuquerque to the rendezvous at Ft. Craig.

Alexander Gardner joined the survey at Ft. Craig, where the expedition was reorganized and again split into northern and southern parties. Gardner joined the northern party, which followed the 35th parallel to California. Bell went with the southern party, which traveled west along the 32nd parallel. However, Bell left the expedition when it reached Camp Grant in south central Arizona. Taking only what he could carry on his horse, and leaving his equipment and negatives behind, Bell rode across Mexico to the coast, caught a ship to San Francisco to return overland to the East Coast and on to England. Bell had been with the expedition about six months and had made perhaps 100 usable negatives, all taken in Kansas, southeast Colorado, and New Mexico. Kansas-Pacific officials complained that Bell's negatives were "not of much account. Most of them are too dim or not well finished and the photographer here complains much of the negatives and says the result is caused by carelessness."

William Abraham Bell's photographs proved useless for the purposes of the railroad, but his experience with the expedition benefited him personally. He wrote a best-seller account of his experiences, *New Tracks in North America* (1869), which proved so popular in both Great Britain and the United States that it went through two editions in two years. Moreover, while he was with the survey Bell had become close friends with it's leader, William J. Palmer, and when Bell returned to the United States in 1871, they became business partners and played a significant role in the development of Colorado. They founded the town of Colorado Springs, as well as the Denver & Rio Grande Railroad, and created a business empire that brought investments and settlers to the state

and made both men very rich. Bell himself founded the town of Manitou, which became an internationally famous health resort, and he lived there until 1890, when he retired to England, where he died in 1921. Briarhurst, the estate Bell built in Manitou, remains one of the town's major landmarks and tourist attractions.

Although William Abraham Bell one of the first to photograph in the difficult conditions of the American West, it cannot be said that he had a significant impact as a photographer. He never mastered the wet-plate process, and in the six months or so he was active as a photographer, made only a limited number of images, most of which were imperfect and virtually none of which were seen by the contemporary public, at least not as original prints. Only two Bell photographs—the one of the body of Sgt. Wyllyams and one of an agave plant—were included in the portfolio of 127 photographs entitled *Across the Continent on the Kansas-Pacific Railroad (Route of the 35th Parallel)* that Gardner produced for the Kansas-Pacific Railroad (and of the four largely complete examples of this very rare portfolio known, all but one is missing the Wyllyams photograph). *New Tracks in North America* is therefore the major reference to Bell's photographs, since its two volumes are illustrated with lithographs and wood engravings copied from photographs, many of them after Bell's photographs (and so credited), some after Alexander Gardner's (but not credited).

New Tracks is the most extensive contemporary account of Western exploration written by a survey photographer, but it is primarily an illustrated travel book that provides disappointingly little information about the trials and tribulations of photographing in the field that would have been useful to a contemporary or insightful to a modern photographic historian. Bell, however, took pains to acknowledge John C. Browne's tutelage, and he included Browne's formulas for coating and developing plates and for sensitizing papers in an appendix because they "did me good service all through my trip," blaming the West's exceptionally dry climate and alkaline water for the poor quality of his negatives.

Very little of Bell's work survives. In addition to the five prints made by Gardner in the extant copies of *Across the Continent*, the thirty-seven vintage albumen prints in the collection of the Colorado Historical Society (Bell's own set), the few vintage albumen prints in the collection of the U.S. Geological Survey, and the several prints (including vintage enlargements) formerly in the collection of Arnold Crane and now at the J.Paul Getty Museum constitute the only known examples of William Abraham Bell's original photographs. The prints at the Colorado Historical Society are all trimmed to an oval, measure approximately 5 ½ × 3 3/8 inches (13.5 × 86 cm), and are the work of a photographer interested primarily in recording visual information without any attempt to achieve dramatic visual effect. Bell was clearly uninterested in exploring the aesthetic potential of photography, and when he abandoned the expedition in he also abandoned whatever personal commitment to the medium he may have had.

WILL STAPP

See Also: Gardner, Alexander; and William Bell.

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BELL, WILLIAM H. (1833–after 1880)

American photographer

William H. Bell was born near Fredericksburg Virginia, into a family of photographers—his father and his four brother brothers were all in the business. The Bells moved to Washington, DC, in the early 1860s and opened a studio, F.H. Bell & Brothers, which employed all the sons at one time or another. Charles Milton Bell (1848–1893), the youngest son, took over Bell & Brothers in 1874, and within a short time the C.M. Bell studio became one of Washington's leading photographic firms. By 1870, however, William H. Bell had left Bell & Bros and relocated to Baltimore, where he opened his own studio. He remained in business there as a local photographer until at least 1880, when he is listed in the Federal Census. Nothing further is known of his life or career.

William H. Bell is a very minor figure in the history of photography, worth noting only because the similarity of their names and the fact that they were both in Washington, D.C., at the end of the American Civil War have led some modern historians to confuse and conflate him with the British-born Philadelphia photographer William Bell (1830–1910), a major figure because of his work for the Army Medical Museum (1865–1867) and the Wheeler survey (1872).

WILLIAM STAPP

BELLOC, JOSEPH AUGUSTE (c. 1800–c. 1868)

French photographer

Joseph Auguste Belloc was born in the beginning of the 19th century, in Montrabe, located in the Southwest of France (Haute-Garonne).

He began his career as a painter of miniatures and watercolors. Belloc's first photographic studio was mentioned in 1851. Practicing daguerreotype, he became involved in wet collodion development and improved the wax coating process, helping the pictures to keep their wet-like luster.

But the most important research he led was about color stereoscopy (3 dimensional photography). Known for his nudes and portraits, he looked for the best way to express the reality and found a new method. This practice considered erotic photography and was declared illegal by the police in 1856 and 1860.

However, he was aware of the new discoveries and tried to facilitate the technique. In 1856, he even registered a patent for a framework and presented his invention at the Société française de photographie of which he was member since 1854.

From the very beginning, he was implied in the photographic democratization, gave photographic lessons and wrote about ten treatises concerning the photographic processes, the way to use them, and some of practical advice.

"Les Quatre branches de la photographie," edited in 1855, was so successful that it was republished three years later.

When he disappeared in 1868, his studio was acquired by Gaudenzio Marconi.

MARION PERCEVAL

BEMIS, SAMUEL (1789–1881)

Dr. Samuel Bemis, a Boston dentist, made his first daguerreotype on April 19, 1840, using a whole plate camera he purchased from Jean-Baptiste François Fauvel-Gouraud of New York four days earlier for the considerable sum of $51. That camera is believed to have been the first sold in America by Gouraud, the American agent for Parisian camera maker Giroux et Cie, and the camera, along with the bill of sale, is preserved in George Eastman House, Rochester, New York, along with several of his early images. The twelve plates Bemis purchased at the same time cost him a further $24, with an additional dollar for carriage.

His first image, of King's Chapel Burial Ground in Boston, showing the small cemetery hemmed in by tall buildings, is also in the George Eastman House collection, which holds the only twelve identified images by him, several of which are variations on the same subject. On the reverse of the plate, Bemis recounted every stage of the process—"Boston, April 19 1840.—S. A Bemis's first daguerreotype experiment.—Iodizing process 25 mts. (apparatus new), camera process 40 mts.—Wind N.W., sky clear, air dry and very cold for the season. —Lens meniscus Daguerr's (sic) apparatus.—Time 4.50 to 5.30 p.m.; N.Y. plate, ordinary."

Bemis took his camera to the White Mountains in summer 1840, but, dissatisfied by the unpredictability of his results, within a year had lost interest in photography completely.

JOHN HANNAVY

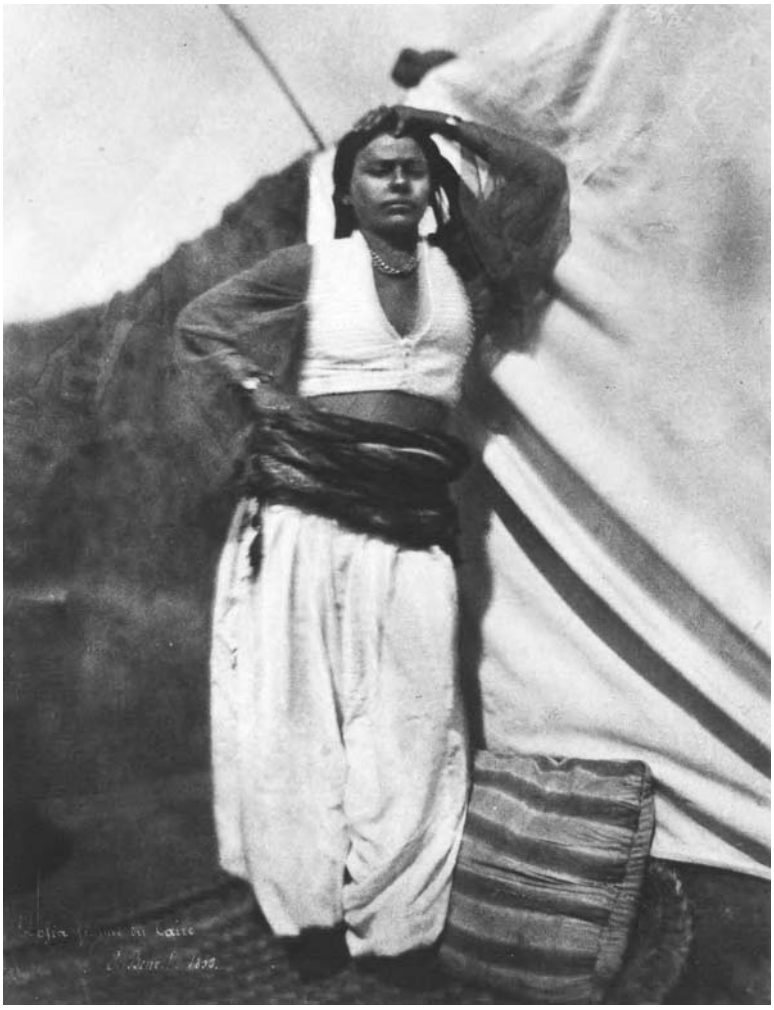
BENECKE, ERNEST (1817–1894)

French photographer

Although Benecke's importance as an early traveler/photographer in the Near East has long been recognized, few of his works were identified until recently. Preceded in his voyage to Egypt by a number off well-known photographers including Maxime Du Champ and Felix Teynard, Benecke differed from them in largely ignoring Pharaonic and other ancient monuments in favor of ethnographic studies. When depicting buildings or landscape, he preferred views of unfamiliar scenes or monuments seen from unusual angles.

Though Benecke can no longer be regarded as the first photographer of everyday life in the Near East, his work remains the most comprehensive body of ethnographic views known from the region during the early years of photography.

A well-to-do amateur, Benecke made no effort to exhibit his work or to join photographic societies, and his biography remains among the most obscure of important mid-nineteenth century photographers. Benecke (1817–1894) belonged to an English mercantile family of German origin that was involved in textile manufacturing. The family firm, Benecke Brothers, had branches at various times in London, Manchester, Leeds, Lille and Alexandria. When the firm was dissolved in 1850, Ernest Benecke remained in Lille. It is not known when and where Benecke learned photography. By the time of his "grand tour" of Egypt, Nubia [modern northern Sudan], Syria, Lebanon, the Holy Land, Greece and Italy in 1852 he was active as a photographer, utilizing the paper negative process to produce salted paper prints. After his return, four of Benecke's studies appeared, some more than once, in albums produced in 1853 and 1854 by Louis-Desire Blanquart-Evrard of Lille, the leading European photographic publisher of the period. This publication of Benecke's work, the only one in his lifetime, may be assumed to be the result of a personal acquaintance in Lille between photographer and publisher.



Benecke, Ernest and Louis Blanquart-Evard.
Zofia, Femme du Caire.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

The rare Blanquart-Evrard albums remained one of the few sources for Benecke's work until recent years. The appearance of an unbound portfolio of 143 signed and captioned prints or images by Benecke at auction in Germany in 1992 has lead to it great increase in knowledge about the artist's Work. Following the dispersal of this album, a second album with more than eighty photographs by Benecke was on the New York art market in 2003 (now Wilson Centre for Photography; London). Although fewer than forty of his images have appeared in widely scattered publications since 1853, a clearer understanding of his style is now emerging.

The largest number of Benecke's known photographs were taken in Egypt and Nubia. Often captioned in French, signed and dated in the negative, the images were made in Cairo, on the Nile, in the Sinai, various villages of Upper Egypt, and the Sudan. Little-known locations and even individuals are identified precisely in the captions. He also recorded ancient monuments in Upper Egypt (February–March 1852), including the temples of Kalabashie and Dakkeh and the Temple of Amenophis ill at El Kab near Edfou, often adopting steep raking angles or other unusual formats. Identifiable locations in Palestine include panoramic views of Jerusalem and Hebron; Benecke's broad, atmospheric technique is particularly well adapted to landscapes or cityscapes of this kind. On the return journey through southern Europe Benecke photographed at a number of well-known sites; including the Acropolis in Athens (August 1852) and the Ponte Vecchio in Florence. Benecke does not appear to have returned to the Near East. An isolated View of Nazareth published by Perez reportedly is dated 1858 in the negative; if this reading of the date is correct, the image was probably dated and printed belatedly.

Benecke's warm, brown-toned prints are technically imperfect, appearing slightly blurred when his human subjects have moved during the exposure. In his most successful portraits the subjects adopt a steadying pose and lower or close their eyes during the exposure, as in *Zofia, Woman of Cairo, in Harem Dress* of 1852. This image appeared in Blanquart-Evrard's album *Etudes photographiques, 1re seire* of 1853; it may be the earliest published photograph of an "Oriental," a genre that was to prove as popular in photography as it already had been for some decades in painting.

The most frequest subjects of Benecke's portrait studies are women, some heavily robed, others in showy "harem" attire (possibly professional dancers) or seminude. He also, however, depicted musicians, a slave dealer, a Bedouin chieftain with his retinue, and groups of children. Scenes of everyday life show a peasant pumping water from the Nile, a potter in his workshop, and the autopsy of a crocodile on ship board. He also made very fine studies of trees (two published by Blanquart-Evrard) and of vernacular architecture in Egypt and Palestine.

Several signed prints by Benecke bear the stamp of the well-known photographer Charles Marville on the verso, indicating that some or all prints from Benecke's paper negatives were not produced by the photographer himself. Prints of all Benecke images are rare, and many are unique; the negatives are not known to have survived. Despite Benecke's lack of interest in marketing his work, groups of his ethnographic studies were acquired by travelers to Egypt or the Mediterranean, including the art historian Emile Prisse d'Avesnes, the well-known sculptor Frederic-Auguste Bartholdi, and the English academic painter Sir Laurence Alma-Tadema. Some of the prints are numbered in the negative; these notations, which run well above the number three hundred, may indicate Benecke's intention to produce a large portfolio, either of his own work or in collaboration with other photographers, that has not been identified.

It is now known that Joseph-Philibert Girault de Prangey, not Benecke was the first to photograph everyday life in the Near East. de Prangey made nearly a thousand daguerreotypes during a voyage in 1844–45, including perhaps a dozen portraits of Egyptians and Turks. A handful of portrait studies, contemporary with Benecke, survive from elsewhere in the Near East, but Benecke's work, nevertheless, remains the earliest important body of Near Eastern ethnographic studies.

DONALD ROSENTHAL

See Also: Blanquart-Evrard, Louis-Desire; Egypt and Palestine; Orientalism; Ottoman empire, European; and Ottoman empire, Asian.

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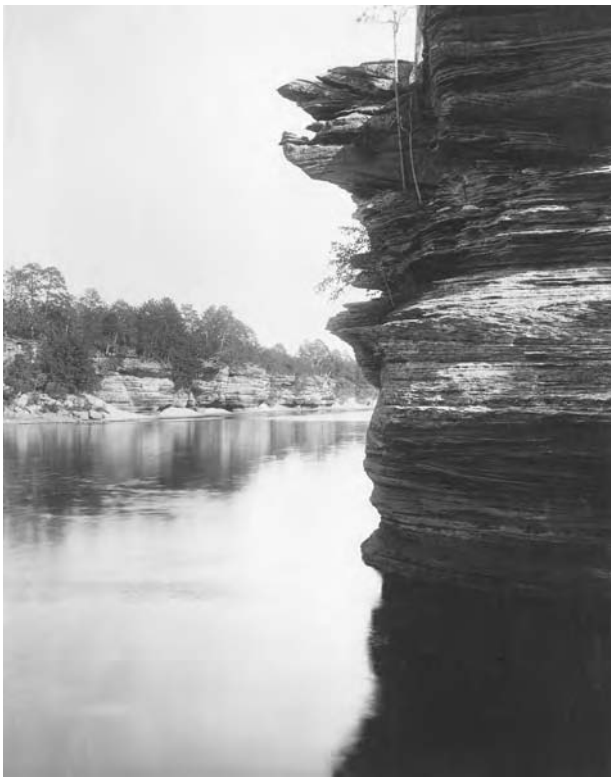
BENNETT, HENRY HAMILTON (1843–1908)

American photographer and inventor

Originally a carpenter, Bennett injured his hand with his own gun in the American Civil War. In 1875 he opened a portrait photography studio in Wisconsin Dells (then Kilbourn City), which is now a museum open to the public. Bennett quickly realised that he could not support himself and his wife just from taking studio portraits and turned his attention to his local landscape. In particular, the unusual sandstone geological formations



Bennett, Henry Hamilton. Wisconsin Dells.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

that ran for six miles along the Wisconsin river. By naming and photographing over 90 local features and other local history sites, he turned the Wisconsin Dells into a desirable, 'must-see' tourist destination. The prosperity he generated led him to market many stereographs for a growing tourist market. In the early 1880s he produced an entire stereo catalogue. Although financially satisfied, he wanted to produce exhibition quality photographs. He did this by using a mammoth plate camera and an eight-by-ten-inch view camera. Using his early carpentry experience, Bennett designed robust camera boxes, printing equipment and tripods that could cope with being used outside in the harsh natural landscape. He also designed a rotating print house, which enabled him to utilise all available natural sunlight to print images throughout the day. Bennett also developed an instantaneous shutter that aided photographing a moving person. This type of shutter allowed him to be able to freeze action and he produced one of his most famous photographs, 'Leaping the Chasm at Stand Rock'.

JO HALLINGTON

BENTLEY, WILSON ALWYN (1865–1931)

A pioneer in photomicrography and meteorology, Bentley spent his life on the family farm in Jericho, Vermont. Bentley never married and obsessively studied and recorded snowflakes, rain, fog, and dew. Bentley's formative years were influenced by his mother; a former school teacher, who was fascinated by all knowledge and possessed an early microscope. Bentley used the microscope to observe snowflakes and attempted to draw them until he convinced his parents to buy a bellows camera and microscope objective. In January 15, 1885, he became the first person to photograph a single snow flake and discovered that each snowflake is unique and individual. Working in relative isolation and without peer recognition for most of his life, Bentley was encouraged by a local professor to share his findings with the world outside of Vermont. In 1898 his first article was published in Appleton's Popular Scientific Monthly. He continued his research and published numerous articles in relative obscurity, until in 1924 he was awarded the first ever grant from the American Meterological Society for his lifetime's work. Bentley never copyrighted his work or did it for monetary gain as he considered his photographs to be 'illustrations of God's work in all its beauty.' His life's work was published in collaboration with Dr. William J Humphreys in 1931, and entitled 'Snow Crystals.' His work was carried out outside, in order to keep the snowflake frozen and intact, which may have resulted in his death from pneumonia in 1931.

JO HALLINGTON

BERGGREN, GUILLAUME (WILHELM) (1835–1920)

Swedish photographer

Berggren was born in Stockholm and in 1850 was apprenticed to a carpenter. In 1855 he traveled to Berlin, where he worked in a photographic studio. Later he traveled to other European cities, and in 1866 set sail from Odessa on the Black Sea to travel around the world.

> When Berggren reached Istanbul and toured the city he was so fascinated that he decided to settle there. He worked for a shipping company until the early 1870s, when he opened a photographic studio on Grand' Rue de Péra. His niece Hilda Ullin (1861–1953) arrived from Sweden and began to work with him.

Berggren was a master of technique and composition, and produced some of the finest scenes of Istanbul and the Bosphorus, and photographs of local people. During construction of the Baghdad railway he photographed many of the cities on the route.

When the Swedish King Gustaf V (1858–1950) visited Istanbul in 1885, he presented Berggren with a decoration. Berggren was also awarded an Ottoman decoration by Sultan Abdülhamid II (r. 1876–1909). When he died his niece Hilda Ullin buried all his photographic equipment with him in the Swedish cemetery in the Feriköy district of Istanbul.

ENGIN ÖZENDES

BERNOUD, ALPHONSE (1820–1889)

French photographer

Jean Baptiste Bernoud, known as Alphonse, was born at Meximieux, Lyon on 4th February 1820. He started his activity as a photographer by doing daguerreotypes on the Ligurian Riviera. In 1850 he worked with Lossier in Genoa at Palazzo Pallavicini, strada Scurreria. In the 1850s he moved to Florence, Santa Maria in Campo, 434, but he also opened branches at Siena, piazza S. Petronilla, and Livorno, via Ferdinanda 71. He became well-known for his photographic portraits, often touched up in watercolours. In 1854 he showed some daguerreotypes of animals at the Esposizione Industriale Toscana in Florence. In 1856 he moved to Naples, via del Boschetto della Villa Reale and then in Palazzo Berio, via Toledo 256. He continued to work in Florence until 1878, in via dei Balestrieri, 434, via dell'Oriolo, 51 and in via del Proconsolo. He took part in the Paris Exhibitions of 1855, 1857, 1867. At the Italian Exhibition in 1861 he won a prize for his "cartes de visite" and his stereoscopic views. He photographed important events: the earthquake of December 1857 in Naples, the fall of the Regno delle Due Sicilie in 1860–1861 and the eruption of Vesuvius in 1872 (P. Becchetti collection,

Rome). He published famous albums such as *L'Italia contemporanea* (1864), with portraits of historical figures. After 1872 he sold all his Italian studios and returned to France. He settled in Lyon, in rue Camille and later in rue des Archers 2, devoting his activity mainly to portraits. Here he died on 24 November 1889.

SILVIA PAOLI

BERTALL, CHARLES ALBERT, VICOMTE D' ARNOUX (1820–1882)

French painter and photographer

Bertall was born Charles Albert, vicomte d' Arnoux, comte de Limoges-Saint-Saëns, the 18th of December 1820, in Paris, France. He studied drawing with neoclassical painter Michel Martin Drolling 1786–1851 and began his artistic career as a draftsman for popular novels—he illustrated Honoré de Balzac's, from 1843 —and newspapers.

At the same time, Albert d'Arnoux changed his complicated name for Bertal (an anagram of his first name), which became Bertall on Balzac's advice.

In the middle of the century, he met Hippolyte Bayard, one of the most active people in the photography realm, and became involved with photography. Together they opened a studio in 1862, place of Madeleine in Paris, specialized in portraits and art reproduction. They separated themselves in 1866—the same year he enrolled in the Société française de photographie Society—but Bertall continued this activity under the name Bertall and Cie and portrayed the artists and intellectuals of his time.

From the beginning of the 1860s, he wrote his own novels and illustrated them. He kept both occupations: writing and illustrating books, and taking photographs of his contemporaries.

He died in the South of France, in his retirement in Soyons, in February 1882.

MARION PERCEVAL

Illustrated books and newspaper Press:

Journal de la Jeunesse
Magasin Pittoresque
Journal pour rire
L'Illustration
La Semaine
Revue Comique

Publications

Les Infortunes de Touche-à-tout. Paris: Hachette, 1861.
Mlle Marie-sans-soin., Paris: Hachette, 1867.
M. Hurluberlu et ses déplorables aventures. Paris: Hachette, 1869.
La Comédie de notre temps. Paris: Plon, 1874–1876.
Pierre l'irrésolu,. Paris : Hachette, 187?.
Les Contes de ma mère. Paris: Plon, 1877.
La Vigne, voyage autour des vins de France, étude physiologique.... Paris: Plon, 1878.
Jean le paresseux. Paris: Hachette, 1879.
Les Plages de France. Paris: Marpon et Flammarion, 1886.
Georges le distrait. Paris: Ardant, 1889.
Les Enfants terribles. Paris: Lahure [undated].

Exhibitions

1855, Universal exhibition, London (with Bayard).
1865, French Photographic Society.

BERTILLON, ALPHONSE (1853–1914)

French photographer

Alphonse Bertillon, who developed the first scientific prisoner identification system though the use of photography, was born on 24 April 1853 to Louis-Adolphe and Zoé Bertillon. After an academic career marked by his expulsion from countless schools, Bertillon earned a baccalauréat at the advanced age of 20. He then completed mandatory military service and perfected his English by working as a tutor in England.

Bertillon's poor academic qualifications and his lack of interest in any apparent career worried his father. The elder Bertillon used his connections to obtain an entry-level job for his son as a clerk with the Prefecture of Police of Paris in 1879. The job required Bertillon to file information on criminals but the filing system was so unwieldy as to be virtually useless. The French police had collected masses of information on criminals but no systematic organization system existed so the information could not be accessed. Folders simply piled up in the filing office. Bertillon immediately recognized the need for a more efficient system of management.

Criminal identification in France before Bertillon was based on photographs, personal recognition, and alphabetical registration. The French police had been taking daguerreotypes of prisoners as early as 1841 but neither the pose nor the lighting conditions were standardized. Additionally, a photograph became obsolete as soon as the shutter snapped. The picture did not age as did its subject. If a criminal was identified, no clear language existed to transmit the details of the photograph to police officers since the definition of "large" or "average" is not precise. The French police had no ability to positively identify a person, especially when criminals were in the habit of using disguises and aliases to conceal their true identities.

Bertillon believed that nature did not repeat itself. A mathematical system of identification would permit easy recording and retrieval of information. But when Bertillon submitted his proposal on 1 October 1879, he was advised by the chief of police to seek psychiatric

help. The French authorities did not appreciate the ideas of a mere clerk, especially one who had a reputation for being reserved and angry. Louis-Adolphe Bertillon, advised to investigate his son's mental stability, recognized the merits of the new system and promoted it to his politically well-connected friends. When the old chief retired, Bertillon received the chance to test his system. In February 1883, he identified his first repeat criminal. By the end of the first full year of testing, he had identified 241 recidivists. When France established the Department of Judicial Identity, Bertillon became its first chief on 1 February 1888.

Bertillon pioneered many techniques of legal photography, including the mug shot. He introduced a system whereby a full face and profile portrait appeared upon every identification card. The photograph included a prisoner's ears because Bertillon believed that they could aid in identification. He took sectional photographs of the forehead alone; forehead including eyes; ears; eyes alone; nose alone; and half the profile. The existence of special marks, such as scars or warts was noted. Bertillon claimed that if a study of these sectional photographs was made feature by feature, someone could recognize a criminal despite never having seen the suspect's face before.

Although Bertillon incorporated photography into his system, he had doubts about the objectivity of the camera. To create the ability to effectively search for a criminal, Bertillon used a mathematical identification process that relied upon human body measurements known as anthropometry. This "*portrait parlé"* or speaking likeness would allow police officers on a beat to apprehend a suspect based solely on a verbal description. Translating bodily features into a universal language also allowed the transmission of physical descriptions by telegraph.

To make a speaking portrait, a prisoner would undergo eleven similarly precise measurements: height, head length, head width, arm span, sitting height, left middle finger length, left little finger length, left foot length, left forearm length, right ear length, and cheek width. Bertillon selected these specific lengths because they were the proportions least likely to be affected by weight change or aging. Bone structure would remain constant. This data was supplemented by the additional details of eye color, hair color, and skin pigmentation so that fourteen total points of resemblance were needed for formal proof of identity. The measurements were filed according to small, medium, and large dimensions. After a Bertillon operator measured a prisoner, he took a new identification card into an archive to look for a card with matching anthropometric values. If he found a tentative match, he would confirm it by referring to the photographs.

Bertillon's system worked best with male prisoners. Anthropometric measurements relied on tightly applying calipers and rulers to body parts. This practice required more physical intimacy between the Bertillon operator and the prisoner's body than was deemed appropriate for male jailers and female prisoners in the Victorian era. Nevertheless, by 1899 the Bertillon system had been adopted by Germany, Belgium, the Netherlands, Spain, Italy, Russia, Sweden, Norway, Turkey, Monaco, Luxembourg, Romania, and Switzerland.

The Bertillon system had a fatal flaw. The measurements had to be taken exactly as Bertillon specified or else they could be inaccurate. While Parisian Bertillon operators took careful measurements, men further away from the supervision of Bertillon were less careful. In one famous American case, two prisoners had the exact same Bertillon measurements, probably because of operator error. The men, who may have been brothers, looked almost identical. Fingerprints were the only way of distinguishing them.

Bertillon was an outspoken opponent of fingerprinting, chiefly because he did not see how fingerprints could be cataloged. However, unlike Bertillonage, fingerprinting was a foolproof means of identification. By the early years of the twentieth century, Bertillon's system had gone into eclipse, as fingerprinting became the judicial identification system of choice. By the mid-twentieth century, it had stopped being used. Bertillon died in Paris on 13 February 1914 of pernicious anemia.

CARYN E. NEUMANN

Biography

Alphonse Bertillon was born on 24 April 1853 as the middle of three sons of Louis-Adolphe and Zoé Bertillon. After attending many grade schools, he graduated in 1873. He traveled to England to teach French and held a series of posts as a tutor. Bertillon returned to France and, during military service, rose to the rank of corporal. He became a clerk in the Prefecture of Police in Paris on 15 March 1879. He formally proposed the Bertillon system it to the French police on 1 October 1879. He married his secretary, Amélie Notar in 1883. The couple did not produce any children. On 1 February 1888, Bertillon became the head of the newly established Department of Judicial Identity. The Bertillon system spread to other nations and Bertillon received a number of honors as a reward. His first honor came in July 1893, when he received the Swedish Order of Wasa. France gave Bertillon the Blue Ribbon of the Legion in 1893. Holland awarded him the Order of Orange-Nassau in 1896. In August 1898, he became a Knight of the Order of Königlichen Kronen (Germany). In March 1902, he became a Knight of the Order of Dannebrog (Denmark). Bertillon's subsequent awards were: 1902, Officer of the Order of the Star of Romania;

1908, Knight of the Order of St. Maurice and St. Lazare of Italy; 1913, Commander of the Order of St. Maurice and St. Lazare of Italy; 1913, Commander of the Order of Isabella the Catholic of Spain. He also received the Drummond Castle medal. Following a long battle with pernicious anemia, Bertillon died on 13 February 1914. He was buried with national honors in the family vault in the cemetery at Père-Lachaise.

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BERTSCH, AUGUSTE NICOLAS (1813–1870)

French amateur photographer and civil engineer

Auguste Bertsch became a well known figure in photography. Bertsch invested little time in the daguerreotype during the 1840s, but that interest became more focused in 1851 during the second era of his photographic career, which spanned nearly twenty years. A few months after the dissemination of Englishman Frederick Scott Archer's negative process on glass, Bertsch put on sale a more sensitive collodion, which attempted instantaneous photography. The columns in the newspaper *La Lumière* created enthusiasm and controversy which centered around Bertsch's process but it was not long before he published the instructions of his process. In 1852 he submitted a patent application for a clever, but still imperfect shutter. This shutter included a mechanical and rotary system which was improved during the 1880s.

Nadar made great use of Bertsch's collodion from 1856. At that time Bertsch's associate Camille d' Arnaud, former newspaper writer, artist and friend of Nadar's as well, tried photography. Both Bertsch and d' Arnaud presented some images at Société française de photographie (SFP) in 1857, those of which included a few of the actress Adélaïde Ristori and the zoologist Henri Milne-Edwards.

Appreciated for their general clarity, and their sharp and soft lighting, their images did not promise, a long career in the field. Their workshop, established in 1855 in a laboratory located above Bertsch's apartment, which was unfortunately close to Pigalle's, did not have the acclaim of the other studios on the grand boulevards which catered to the Parisian middle-class. From 1854 to 1857, Bertsch's collaboration with d' Arnaud was rather profitable with successes such as the portrait of the Félicité priest on Lamennais on his deathbed, in 1854 in the Historical Musée of the town of Paris; of their instantaneous photography, like the image of pedestrians infront of the Blanche place, 1855, SFP; and of reproduction of engravings, and scientific photography (SFP).

Additionally, they attempted twice to produce images of an eclipse. They used the new glasses of Porro to photograph the moon eclipse on October 13th, 1856. The moon eclipsed itself little by little, and proved to be another occasion which illustrated the great sensitivity of Bertsch's collodion. On July 18 1860 they tried to photograph the multiple phases of a total lunar eclipse in Paris.

In addition to their interest with lunar photography, the microscopic world too was often under their meticulous observation. Several images are stamped dating to their collaboration, however, photomicrography was Bertsch's field which from 1851 to 1870, he most favored. Focused on optics and natural science, his advanced techniques enabled him to acheive results which exceeded what had been currently attempted at the time. He used the wet collodion process on glass with great dexterity, and reached exposure times of a tenth of a second according to his records. Moreover, the transparency of the glass, which combined reproducibility and smoothness of the image, adapted better to the photography of the infinitely small than that of the single plate daguerreotype (Foucault) or the less distinct calotype (Talbot).

The clarity of his stereotypes was also due to the quality of his solar microscopes, which used achromatic lenses which reduced spherical aberration, and they were sometimes fitted with a polarizer. Bertsch built these between 1852 and 1861, in conjuction with professor Hartnack's knowledge and aid in1857. Capable of proving undeniable evidence in the microscopic field, these photographs were, for Bertsch, the means of improving the scientific community. Now photographic proof of observations under the microscope could support or discredit theories. Scientific discredits were often the result of exaggerated and whimsical conclusions of certain negligent scientists. Acarina, the apparatus causing the phosphorescent glow of the glow-worm, cuts of wood, red globules, diatoms, and crystals were many subjects which when maginified from 50 to 500 times, illuminated under direct, oblique, monochromatic or

polarized light provided truth and illustrated the many possibilities of this medium.

A text entitled Studies of Natural History Under the Microscope provided the gallery for the microscopic "portraits" taken. The boards were joined together in a portfolio and made available for ordering. Presented at the SFP (1855, 1857, 1859) and at the World Fairs (1855, 1856, 1867), these were greeted by the press with special interest because of their precision as images. Additionally, they served as advertisements of a renewed union between photography and science. After sending his illustrated atlas to the Ministry for the State of Education, Bertsch was decorated with the Legion of honor in 1858. However, in spite of this reward and the remifications of its results to the Academy of Science in 1853 and 1857, the scientific community could not adapt to this method and thus remained indifferent to the technique.

As a founder and member of the SFP in 1854, Bertsch became part of the Board of directors from 1858 to 1870, and was often named at boards of examiners of apparatuses because of his selection of exposures. He regularly presented to them his improved work, devices, and techniques. The majority of photographers were often encumbered by imposing darkrooms in order to achieve enlarged photographs so Bertsch developed a technique based on the image captured on small instantaneous stereotypes, which was then increased. Between 1860 and 1863, he invented a solar megascope, which was among the best of the recently produced enlargers. In spite of Bertsch's desire to popularize photography, his remarkable instruments attracted only some followers.

Biography

A skillful technician and rigorous inventor-manufacturer, Bertsch was an easy and modest photo hobbyist who defended, with enthusiasm, his interpretation of photography. In spite of some obvious failures, praises that testified to his work registered him in history. He is considered by all traditionalists of historiography and as a figure not to omit. According to his birth certificate, Auguste Nicolas Bertsch was born on December 6, 1813 in the old 2nd district in Paris, today known as the 9th and not far from the Garnier Opera. He was the first child of George Frederic Bertsch, a tailor, and of Anne Francoise Landry. Bertsch lost his father at 9 years old, and married later in life, on March 29, 1865, to Marie Emilie Pizzetta, 28 years his junior. As a civil engineer, Bertsch began his photographic activities in 1851. He had moved in 1848 to the 5th floor of the 27 street Fontaine Saint-Georges and joined in 1854 Camille d' Arnaud, a student of Nadar's. Together, they created a studio-laboratory in the small panelled space of the 6th stage, but their collaboration lasted only briefly. A founding member of the Société française de photographie in 1854, he presented his work to them and defended his idea of photography. He remained there until his death during the Franco-German war in 1870-1871. Forgotten mainly in connection with the process of negative-glass, wet collodion, he was remembered for his application for creating photographs for microscopic use and for his apparatuses heralding the photographic practice at the end of the 19th century.

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BEY, MOHAMMED SADIC (1832–1902)

Photographer, military officer

Born in Cairo in 1832, Sadic was educated in Egypt and in Paris, where he trained as an engineer at the *Ecole Polytechnique.* As a Colonel in the Egyptian army, he was the first to photograph the two holiest cities of Islam—Medina and Mecca—in 1861, and to document the *Haj.* Although the survey account and his photographs were not published until 1877 (*Summary of the Exploration of the Wajh-Madinah Hijaz Route and its Military Cadastral Map*), his accomplishment was widely reported. In 1880 he was assigned as treasurer to the annual caravan bringing the *mahmal*, the embroidered covering for the *Kaaba*, from Cairo to Mecca. He photographed the pilgrims as they camped along the journey and in Mecca again made photographs of pilgrims circling the *Kaaba,* the al-Safa Gate, the tomb of the Prophet's parents, and Shaykh 'Umar al-Shaibi, the guardian of the key of the *Kaaba*. In Medina he photographed Sharif Shawkat Pasha, the guardian of the Prophet's Mosque, and made panoramic views of the city from the walls. Sadic's earliest photographs of Medina were exhibited in the Egyptian pavilion at the Philadelphia Exhibition of 1876. In 1881, he displayed a portfolio of photographs of the holy cities at the Third International Congress of Geographers in Venice where he was awarded a gold medal.

KATHLEEN HOWE

BEYER, KAROL ADOLF (1818–1877)

Karol Adolf Beyer is one of the most important Polish photographers of the 19th century, and is best remembered for his famous photo-panorama of the city of Warsaw. Born on February 10, 1818, in Warsaw, Poland, Beyer was a publisher, numismatist and political activist, and also played a significant role in introducing new technological developments in photography into Poland and popularizing the medium. In 1844 Beyer opened one of the first daguerreotype studios in Warsaw, having become familiar with the daguerreotype process during a trip in 1842 to Paris and parts of Germany. He introduced the collodion negative process to Warsaw in 1851, which he had learned during a trip to London that same year. Additionally, Beyer published a number of photographic albums on a wide range of themes, and created photographic reproductions of important Polish national treasures and artworks. Around this time he also produced an important ethnographic photographic series, for which he photographed Polish peasants in their national and local costume.

In 1857 Beyer produced a photo-panorama of the city of Warsaw. Shooting from the cupola of Warsaw's St. Trinity Lutheran Church and using the wet-plate collodion process, Beyer took twelve sequential photographs in order to produce a 360-degree view of the city. Beyer continued to promote and advance photography in Poland throughout his life, co-founding the illustrated magazine *Tygodnik Ilustrowany* ("Illustrated Weekly") in 1859 and in 1870 opening the first studio in Warsaw to produce photographs using the Albertotype process, which Beyer learned from Joseph Albert while in Munich some years earlier. Beyer died on November 8, 1877 in Warsaw, Poland.

MAXIM WEINTRAUB

BIBLIOTHEQUE NATIONALE DE FRANCE

Photography is displayed in all departments of the Bibliotheque Nationale de France, however it is mainly located in the department, Cartes et Plans (Charts and Plans), and especially in the department Estampes et de la Photographie (Prints and Photography).

In 1851, the first image donated to the Bibliotheque Nationale de France was by Louis-Désiré Blanquart-Evrard, editor-photographer and was copyrighted, which at that time was optional because the law did not impose it on photographers as judiciously as they did with engravers. At least 100,000 images became part of the Bibliotheque in this way until 1914. Later images were purchased or given as gifts to supplement the donations, which were needed and remain necessary today as the Bibliotheque Nationale de France depends on the goodwill of photographers and the photographic dealers in France for additions to the collectioin held in the Bibliotheque.

Prior to 1941 the Bibliotheque had no protocol for handling donations so a service for collecting photographs was created within the Cabinet of the Prints at Jean Laran's request, who was chief of the Cabinet from 1939 to 1942. Jean Prinet followed until 1954, and later, Jean Adhémar from1961 to 1977, were the first people in charge of this new program. This was the starting point of a policy for voluntary and organized donations to the Bibliotheque as nearly 500,000 images had been collected between 1949 and 1961, and useful and profitable contacts with professionals, and experts of photography had been established.

In 1949, 50,000 images were acquired from the workshop of Felix and Paul Nadar, and in1954, the Reutlinger studio donated 30,000 images of Léopold taken in 1853. One of the first private collectoions of nineteenth centruy photography, established by George Sirot, which contained 75,000 images, were obtained via purchase in 1955, with the rest donated in 1956. Many images, letters, and handwritten notebooks of Louis-Alphonse Poitevin's, who was considered a major contributor to photography after Nicéphore Niépce and William Henry F. Talbot, were donated in 1989.

The first exhibition in France was held at the Bibliotheque consisting of portraits du passé (1961), Atget (1964), Nadar (1965), and Niépce (1967).

In 1976, the Cabinet of the Prints became the Department of the Prints and Photography. In the prestigious Mansart Fallery of the Bibliotheque, expositions became "an invention of the 19th century, expression and technique of photography," which paid full homage to the Société française de Photographie. 346 pieces of work were donated (1854). These events, which were accompanied by a catalogue that reproduced all the images, inspired the Bibliotheque to hold exhibits and rotate out images with other to allow the public and historians access to various different images to study them.

This initiative with the support of Metropolitan Museum of Art, 1980, became the year of the "Regards sur la photographie en France au XIXe siècle" (Paris, Petit Palate and New York, with 192 images and 102 photographers). In 1983, it introduced "George Sirot 1898–1977" (Paris, bibl. nat., approximately 170 parts), however, unfortunately, the show was without a catalogue. Then "Le corps et son image" was shown in 1986 (Paris, palate of Tokyo, 89 photographers, 171 numbers). The first two exhibitions increased the anthology of work. More modest achievements although, which were just as instructive and appreciated as other major works, were held in the Galerie de Photographie at the national Bibliotheque, which opened its doors in 1971. This space accomodated and was devoted to more than 120 exposures, the majority of which belonged

to young contemporary authors, until it permanently closed in 1996.

The year 1989 marked the celebration of the 250th anniversary of photography and included five major expostions in Paris. The national Bibliotheque hosted two of them, one in conjunction with the Musée d'Orsay which displayed a wide selction of 19th century images under the title, "L'invention d'un regard" (Paris, Museum of Orsay, 281 images belonged to a majority of these institutions).

Other exposures followed which depicted personalities, and subjects of a current period, revealing important dimensions to the donated material. Included were "L'Art du nu au XIXe siècle" (Paris, bibl. nat. of France) in 1997, "Les frères Bisson photographes" (Paris, bibl. nat. of France) and "Degas photographe" (in conjunction with the Metropolitan Museum of New York and the J. Paul Getty Museum, presented in Paris, bibl. nat. of France, New York, Los Angeles) in 1999, and "Voyage en Orient, photographies 1840–1880" (Paris, bibl. nat. of France) in 2001.

The national Bibliotheque participated in raising awareness of photography to the extent of establishing it as having culturally recognized value. The Bibliotheque also supported the movement through frequently lending their collections to other French or foreign institutions like "Nadar, les années créatrices 1854–1860" which was organized in 1994 by the Musée d'Orsay and Metropolitan Museum of Art, New York, and "Eugène Atget, le pionnier" which was put together in 2000 for the photographic Inheritance (Paris, Hôtel of Sully).

All the great names of photography are represented at the Bibliotheque like: Antoine Samuel Adam-Solomon; Olympe Aguado; Eugene Atget, of whom's work 3,600 images were purchased between 1900 and 1927; Edouard Baldus; Louis Auguste et Auguste Rosalie Bisson; Adolphe Braun; Etienne Carjat; Hippolyte Auguste Collard; Louis Emile Durandelle; A. A. Eugène Disdéri; Gustave Le Gray; Henri Le Secq; Charles Marville; Félix Nadar; Charles Nègre; Pierre Petit; and Victor Regnault. The images of the following photographers however are unfortunately rare or completely absent in the collections of the other French or foreign institutions: Charles Aubry; Bruno Braquehais; Adalbert and Eugene Cuvelier; Constant Famin; Jacques Antoine Moulin; Camille of Olivier; Achilles Quinet; Adrien Tournachon; Julien Vallou of Villeneuve are all underrepresented internationally.

Albums though, of voyages and early reports are located at the Bibliotheque such as Edouard Delessert's Italy, Gustave de Beaucorps' Spain, Ambroise Richebourg's Russia, and Maxime Du Camp's Egypt. Auguste Salzmann's images of l'Orient, along with accounts from Louis De Clercq, Felix Bonfils, James Roberson are available for viewing also.

Examples of pictorialism can also be located at the Bibliotheque, with many images from Alfred-Louis Begoz, Maurice Bucquet, Jean Ferdinand Coste, Robert Demachy, Etienne Descargues, René Lédard, Constant Puyo and famous publications such as the *L'Epreuve photographique*, *L'Art photographique*, *Camera Work*. Further documents included in the collections are nearly 1,800 single documents of nature in ambrotypes, ferrotypes, autochrome plates, daguerreotypes (plates by Louis Fizeau, Leon Foucault, Joseph Philibert Girault de Prangey, of the baron Large Jean-Baptist-Louis...), calotypes, plates with collodion, flexible supports by George Balagny, and various other formats.

The technical progress of photography was advanced by the hard work of pioneers such as Louis Ducos du Hauron who researched and developed the three-colour processes, Abel Niépce de Saint-Victor who worked with photogravures, Joseph Lemercier's work on lithophotographies, Alphonse Poitevin's exploration with photolithographies and coals, and finally Etienne Jules Marey's motion-analyses. Their advances and other made to standardized production in 1855, contributed to the popularization of the photographic image. The collection at the Bibliotheque includes portrait-cartes or *carte-de-visites*, 50,000 images of which, not counting the 18,000 images from Disdéri's workshop, were purchased in 1995, as well as carte albums totaling 18,000 images, and 20,000 stereoscopes on paper. These artifacts of photography have become invaluable testimony to amateur practices, starting with the beginning of photography where the images were of sitters in long-held poses to years later when the images and position of the sitter gave the impression of an instantaneous photograph. These are priceless documents for the historian as these images capture people in their familiar and private environments throughout time.

Although tracking and maintaining whole collections is a main priority for the Bibliotheque, some collections are donated in many separate donations, or are donated unlabeled. The dislocated collections however that are then reunited, happen largely because of the people that research them or because they are required by occupation to know about this information. This data of 19th century photographers is kept organized in a methodical table ordered by subject to facilitate the location of any image searched for. The Bibliotheque has gone to great lengths to organize the catalogues and monographs on the authors and the history of photography, both old and recent. This documentation has been exhaustive for the French publications, and the department's new site (Bibliotheque François Mitterand) supplements this. There are numerous files and, in particular, an abundance of correspondence including what survived the closing of the Nadar and Poitevin's workshops.

The department conducted the examination of

specialized reviews of the most important content published in the 19th century (*Bulletin of the Company French of Photography*, *Bulletin of the Photo-Club of Paris*, the *Light*, the *Monitor of Photography*, the *Review of Photography*) and gathered a collection of articles relating to the old exposures. This was then filed and sorted to provide easy referencing.

BERNARD MARBOT

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BIEWEND, HERMANN CARL EDUARD (1814–1888)

German daguerreotypist

Biewend was born on 28 August 1814 in Rothehütte near Hanover. He was a scientist and amateur daguerreotypist. He studied sciences and gained his doctorate. After his studies he applied in 1843 for a job as treasurer in the Royal Bank of Hamburg in Clausthal and got the rights of an inhabitant of Hamburg. He published many scholarly articles on chemistry and may have collaborated with another scientist to test lenses and cameras. He began to photograph sometime between 1846 and 1849, and he was one of the few German daguerreotypists to make landscapes and architectural views as well as portraits.

Biewend participated for a long time only as an amateur daguerreotypist who enjoyed little interest. This was because the photo historians only knew two daguerreotypes by him. That changed with the discovery of a lot of his work in a private collection of the Hamburg-photographer Werner Bokelberg (1937–).

Thanks to this discovery we do know that Biewend not only photographed architecture but also his family and friends. His portraits show often himself, his wife and children, his sister and her family. The portraits were most of the time taken on location, often posed outside his house or his sister's home in Germany. Typical in Biewend's photographs, is the persons often are placed full-length within the setting. The setting is integral to the composition, and to our understanding of the portrait as an intimate and informal family gathering. While Biewend had to deal with changing light and weather conditions he conquered the challenge of complete control of his lighting. The fine detail and delicate surface of his daguerreotypes gave his images a quality that was quite different from others and unique. He was an artist of rare delicacy and used sunlight and shadow to great effect.

Much information concerning Biewend has been found in his notes of 25 September 1843, like the fact that he took over the function of treasurer from Schirven Knoph. He worked during 33 years as a treasurer for the bank, from 1843 to 1876. This has been unknown for a long time. Just after the discovery of the daguerreotypes in the private collection or Bokelberg, someone started to do research in the old town files of Hamburg. Between 1846 and 1849 Biewend started to do experiments with photography. He experimented in his laboratory with gold, silver and other metals, as well as with indigo, saltpeter and potassium, pyrolusite and other chemicals. It is rather strange that in those times it was accepted to combine a job as a treasurer with a free practice. Biewend could clean gold and other metal very well and introduced this in his sensitive solutions, supposedly by his experience in his state office. There he had, of course, experience with very fine and detailed work like with gold and silver on the currencies.

That had to be correct during the manufacturing of currencies. The many details on Biewend's daguerreotypes are very characterizing for his work. He left behind a treasure of information on his daguerreotypes such as the type of camera, data of the subject, place, and time. Both the contents and the technical aspects of the photograph are defined, also a habit from his profession in the bank. Since daguerreotypes are on polished silver and subject to tarnishing, daguerreotypes were put behind glass and sealed with paper tape so air could not tarnish the plate (there often is some tarnish around the edges of the picture). Daguerreotypes that have survived show Biewend's skilled use of painted backgrounds, of curtained dummy windows. Several of these examples were handcoloured. Coloring was applied very carefully with dry color mixed with finely powdered gum, for the daguerreotype image is very delicate. Breathing on the plate was sufficient to soften the gum and fix the color. His portraits were among the best ever done

by daguerreotype process; they display great sense of composition, awareness of background and props, and naturalness in pose and expression.

Later, in the collection of Voigtländer, two daguerreotypes of Biewend were found, on which were mentioned the technical data. The photos of Biewend have supposedly arrived in Voigtlander's collection because they were related. He stayed in Saint Georg, is now a part of Hamburg.

Unfortunately, during the years people destroyed more than one hundred of his daguerreotypes with themes as landscapes, architecture and portraits. In 1876, he retired from the bank. Biewend died at the age of seventy-four on 31 December 1888 in Hamburg.

JOHAN SWINNEN

See Also: Germany; Daguerreotype; Coloring by Hand.

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BIGGS, THOMAS (1822–1905)
English photographer

Captain, later Colonel, Thomas Biggs produced a body of work in India in the mid 1850s using post-waxed paper negatives, long after most photographers had eschewed paper in favour of collodion on glass.

Born in Hertfordshire, England, Biggs joined the Indian Army in 1842, serving in the Bombay Artillery, before learning photography with the East India Company and being seconded for a few months—from February to December 1855—to the post of Government Photographer in the Bombay Presidency, then the name given to a large area of British India.

His assignment was to start to document the many historic architectural sites within the area of the Bombay Presidency.

With the task only partially completed, he returned to military duty in December 1855, being succeeded by Dr William Henry Pigou who continued his work.

Certain aspects of the work did not suit his tastes —in letters in the India Office records, he expressed his distaste at some of the sculptures he was required to photograph and wrote of their 'disgusting immorality' (see *India Through the Lens*, Prestel, 2000).

A second series of assignments in the 1860s resulted in further images, still apparently using paper negatives, which were widely published. There is no record of him continuing with his photography after returning to England.

JOHN HANNAVY

BINGHAM, ROBERT JEFFERSON (1824–1870)

On the backs of *carte-de-visite* photographs produced by British-born photographer Robert J. Bingham in his studio at 58 Rue de Larochefoucauld in Paris was printed the claims 'inventeur du procedé collodion' and 'Medailles de 1re Classe 1855–1862.' He was a resident in Paris by 1851, and operated a portrait studio at that address from 1861 until 1870.

He was one of several photographers who claimed to have successfully experimented with collodion before Archer published his account of the process in 1851. His claim was based on a note in the 7th edition of his manual *Photographic Manipulation* published in 1850, a note which largely reproduced a similar account published by le Gray in his *Traite Pratique de Photographie sur Papier et sur Verre* in 1850. The process had been predicted since 1847.

Born in Billesdon, Leicestershire, England, in 1825, as the son of a customs officer. He moved to Paris c.1850, and his studio initially specialised in the photography of works of art. He was certainly in Paris by the date in 1851 when the contract for printing the illustrations for the Reports of the Juries of the Great Exhibition was being assigned. The contract was initially offered to him through the London art dealer Richard Colls, but was withdrawn after Talbot was granted an injunction in January 1852.

JOHN HANNAVY

BIOT, JEAN-BAPTISTE (1774–1862)
French scientist

Jean-Baptiste Biot was born in Paris 21 April 1774, the son of Joseph Biot, an upwardly mobile government functionary originally from Lorraine. After a classical education at the respected Collège Louis-le-Grand in Paris, Biot began taking private lessons in mathematics. Hoping for a career in science, he resisted his father's wishes that he enter into commerce. Enlisting in the army in 1792 allowed him to evade his father's control while simultaneously earning the experience and record of government service that helped him gain entrance to the newly formed École polytechnique in 1794. Biot soon emerged as an exceptionally promising young scientist with widely related interests in astronomy, optics, mathematics, physics, and chemistry.

In 1801, Biot was elected to the Académie des sciences. Soon after, he was invited to join the Société

d'Arcueil, the most fertile scientific circle of its day. There, in 1809, he became better acquainted with François Arago, a younger colleague in astronomy, with whom he would have a long and stormy professional relationship. They traveled together for the Bureau des longitudes and collaborated on several projects and papers early in their careers but soon developed opposing scientific views. By 1815, they were engaged in a polemical rivalry over competing theories of light, with Biot taking a conservative neo-Newtonian position while Arago embraced the new and more radical wave theory of light. Twelve years Arago's senior, Biot was an Orléanist and a devout, regenerate Catholic, an eloquent and dignified academic whose productivity in research and publishing nevertheless failed to win him an 1822 bid for the Académie's highest post of *Secrétaire perpetuelle*. To Biot's disappointment, this coveted, permanent seat would go to his rival in 1830, which provided the radical constitutional liberal Arago with tremendous power and influence. Biot had to be satisfied with his election in 1835 to the Académie's temporary post of vice president.

Despite their differences, Arago and Biot would soon become pendant figures as the two main academic supporters of early photography. With their mutual expertise in optical science, they made natural technical consultants for emergent photographic science, and Jacques-Louis Mandé Daguerre sought them both out in the mid- to late 1830s. In 1838, together with Alexander von Humboldt, they officially examined Daguerre's process prior to the Académie's first public report on daguerreotypy in January, 1839. Biot's remarks to the Académie at the January 7 meeting echoed those of Arago in describing the process as a formidable tool for empirical science; he saw the process as a new means "to study the properties of natural agents" and to supply independent proof of scientific assumptions. Concluding that first official communication on photography, Biot credited Daguerre with having placed an "artificial retina" at the disposal of physicists.

By this time, Biot and Arago had set aside some of the bitterness of their rivalry. However, when the British photographic inventor William Henry Fox Talbot learned that Arago had brought Daguerre's work before the Académie, Talbot cannily approached Biot to present his claim of priority of invention to the Académie. Biot was famously supportive of younger colleagues, a respected elder who embraced the ideal of an international, politically disinterested realm of pure scientific dialogue. In the months to come, Biot served as Talbot's advocate before the Académie on numerous occasions. Still, there was no obvious conflict between Arago and Biot over the Daguerre/Talbot contest. For his part, Biot had no significant personal stake in Talbot, although the men were acquainted through British scientific circles. However, Biot did have an old and dear friendship with Talbot's main ally and scientific advisor, Sir John Herschel. In acting as Talbot's representative before the Académie, Biot may have been acting upon the friendship and courtesy he felt for their mutual friend, Herschel. While giving Talbot a window to the official proceedings, Biot was careful to maintain his neutrality. From 1839 to 1841, he corresponded with Talbot in a spirit of honesty and good faith, giving advice and reporting to the English inventor on the Académie's continuing discussion of his claims. He also thoroughly examined Talbot's methods, and personally presented each of Talbot's successive communications and his own findings to the Académie, but he would not enter the debate as a partisan. Yet Biot ultimately expressed his frustration over the rivalry between Daguerre and Talbot—and other photographic inventors, for that matter—and plainly felt that Talbot's reticence to reveal his methods was harmful to scientific progress, as well as to Talbot's own best interest. More than once he urged Talbot to quit stalling and publish explicit descriptions of his methods. By the end of almost three years of Talbot's protracted struggles with the Académie, Biot was perhaps weary of carrying out the service of intermediary. When Talbot sent Biot some photographic papers and instructions for their use in 1841, Biot declined to examine them himself, but instead passed them on to Victor Regnault, a colleague with fresh enthusiasm for the new art.

Biot was not known as a photographer himself, and it appears he did not belong to any of the early photographic societies. His role in early photography was thus essentially that of a technical authority. In addition to examining Daguerre's and Talbot's processes, he joined Regnault in assisting Louis Désiré Blanquart-Evrard when Blanquart brought his paper process before a joint committee of members of the French academies of science and beaux-arts in April of 1847. There, Biot also agreed to an impromptu sitting to test the suitability of the process for portraiture. Indeed, unlike Arago, of whom no photographic portrait is known, Biot posed for a number of portraits, including sitting for Regnault at least four times. As a gesture of respect, Regnault sent some of those portraits to members of the British scientific community as mementos of this esteemed French scientist.

Biot was a respected writer on historical subjects as well as science, and over his long life he published more than 300 articles and many textbooks. He died in 1862 at the age of 88.

Laurie Dahlberg

Biography

Jean-Baptiste Biot was born in Paris 21 April 1774. Although his father wanted him to enter commerce, Biot

was drawn to science and mathematics. After serving in the revolutionary army (1792–1793), Biot entered the newly formed École polytechnique in 1794. His wide researches in physics, chemistry, mathematics, and subfields like optics won him the recognition of the great scientific leaders Laplace and Berthollet, who welcomed him into the elite Société d'Arceuil around 1801. His research and breadth of knowledge made him one of the first technical consultants in the emerging field of photography and as a member of the Académie des sciences he was appointed to examine Daguerre's, Talbot's, and Blanquart-Evrard's photographic processes, among others. A close friend of Sir John Herschel, Biot also agreed to serve as the intermediary for Herschel's associate William Henry Fox Talbot when Talbot brought forward his claims of priority for a photographic process before the Académie in 1839. It is not thought that Biot made photographs except in an experimental capacity and no works have been attributed to him. He died in 1862.

See Also: Herschel, Sir John Frederick William; and Talbot, William Henry Fox.

Further Reading

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BIOW, HERMANN (1804–1850)

German daguerreotypist

Hermann Biow was born in 1804, possibly in Hamburg. Initially working as a painter, lithographer and writer, he was one of the first German daguerreotypists and opened his studio in August 1841 in Hamburg, Altona. From 1842 to 1843 Biow worked with the photographer Carl Ferdinand Stelzner. He evolved into a specialist portrait photographer. Biow is also well known for making documentary daguerreotypes of the aftermath of the 1842 fire in Hamburg, although only three of the supposed forty-six made at the time survived, now preserved in Hamburg, (Historical Museum and Museum of Art and Design). In 1846 Biow began practising portrait photography in Dresden, Berlin and Frankfurt am Main, focussing on prominent politicians, artists and scientists, including the Prussian King Friedrich Wilhelm IV, Alexander von Humboldt and the Brothers Grimm (1847) which were later engraved and published as *Deutsche Zeitgenossen* [German Contemporaries]. Between 1848 and 1849 he daguerrotyped the Parliamentarians of the German National Assembly in Frankfurt am Main, later edited in an album of lithographs, Männer des deutschen Volks oder Deutsche National-Gallerie" [Men of the German Nation or German National Gallery]. Biow opened a new studio in 1849 in Dresden, but died soon after on 20 February 1850.

Stephanie Klamm

BÍRÓ, LAJOS (1856–1931)

Lajos Bíró was a Hungarian natural scientist and ethnographer, born in Tusnád, Zilah county, currently Tusnad, Romania, in 1856. As a recognized zoologist he travelled to New Guinea, where he stayed from January 1896 to December 1901. During his six years of zoological, ornithological and entomological research, he collected over 200,000 animals, mainly insects and more than 6,000 pieces of ethnographical objects. He brought back several thousand pages of notes and more than two hundred photographs to Hungary. And upon returning home, he worked as a natural scientist. In 1926 he was awarded as an honorary doctor of the University of Sciences of Szeged, Hungary. He died in 1931, and more than two hundred animal species and eighteen genera are named after him. In deed, he discovered six new species, which can be found in his collection of birds and one was even named after him.

During his travels, he took documentary photographs for scientific, anthropological, and ethnographical purposes. His recordings made it possible to learn about a mostly undiscovered society of the tropical island with documentation, notes and references that are still referenced today.

In the course of his travels, Lajos Bíró went to several places outside Europe, like India, Ceylon, South East Asia, Anatolia, and North Africa. He took scientific photographs in Singapore, Bombay, Tunis, and Tripoli, but the six years spent in New Guinea were what established international reputation amongst Hungarian scientist.

His first expedition for zoological research was on 7th November 1895 to the second biggest island of the world to continue the work begun by the Hungarian natural scientist Sámuel Fenichel. He worked in what was the German New Guinea when the landscape was almost unapproachable due to the tropical climate, impenetrable jungle, high mountains reaching into the heights of 40,000 meters, and deep valleys. Incurable diseases like malaria, dysentery, and smallpox afflicted not only Europeans but natives, too. Therefore, several tribes fearing epidemics, mainly in mountain areas, lived extraordinarily isolated from each other.

Communication with the external world was further hindered by seclusion because of the specific laws of bartering, via language barrier, and by the lack of geographical information. As a result, at the end of the 19th century natives lived there at a level of development of the Palaeolithic age. This way of life was recorded with a high degree of precision and scientific authenticity by the documentary photographs of Lajos Bíró.

His work was hampered by numerous circumstances, like the murderous climate, language differences, difficulties with travel, and with obtaining and replacing instruments. However, in spite of these hindrances, he collected and prepared insects and birds often using every moment to conduct microscopic studies and to make notes, drawings and photos.

His most valuable photographs were taken on the northern and northeastern coastal regions of the island which had been undiscovered from an ethnographical point. The land that makes up this area are the little islands in front of Aitape (Berlinhafen), Seleo, Ali, Angiel (Angel Island); Erima in the Bay of Astrolabe, around Staphansort and its villages (Bongu, Bogadjime); several sites of the Mountains Hansemann, Oertzen, and Constantine, Bilibi (Bilibili Island), Siar, and Gragat Island, in the region of the Huon Bay. He visited the whole peninsula setting off from Simbang (close to Fischhafen). He also stayed with the highlander Kaio's, with the Jabim's living at the coast and visited Tami Island, and the Bukawa's living on the northern coast of Huon Bay. His travels also extended to the New Ireland Islands, and the (Vitu) French group of islands.

Lajos Bíró's photographs can be divided into four major thematic groups:

- Landscape, natural plants, and their transformation;
- Anthropological photos of natives;
- Recording their way of life, their culture, and traditions;
- Way of life of European settlers, and their settlements.

Full-length, standing or sitting, photos of the inhabitants of various villages are mainly group photographs or portraits made in relaxed, natural postures. Ethnographers were, however, were primarily interested in photographing places, objects, or activities of everyday life like, family houses, the yam stores, a meeting house under construction, the fish barrage, people travelling, agriculture, fallow lands of one and two years, yam plantations, coconut germination beds, or even snail bracelets, potters at work, and also people cooking dinner, or preparing kava. Similarly, the rituals of the closed communities, which were hidden from certain members of the community itself, such as the ghost house in Seleo, and ritual accessories like musical instruments, or festive rituals like the funeral feast, ritual dances, and partaking people, which is the circumcision of the young, were also of interest to ethnographers.

Since Lajos Bíró could see the inevitable effects that people like him posed to the colonial people and their culture, he considered photographing extremely significant and thought of it as his obligation to make the records of their status and development as authentic as possible. This deep sympathy and understanding can be well sensed in the informal atmosphere of the pictures.

Another of Lajos Bíró's interests was to photograph the living quarters of the Europeans. In one photograph in particular, the official building of the German Government can be seen in the shadow of huge palm trees. The house stands on piles, and has a spacious veranda richly decorated with artworks of local hand craftsmen. Among other images that were photographed was a grocery, a study of the officials of the German administration in Friedrich-Wilhelmshafen, supervisors and workers on tobacco plantations, which were directed by the members of the Neu-Guinea Compagnie, and the flagged building of Club Astrolabe in Stephansort. These places were designed with careful landscaping, indicative of a European presence. Europeans in tropical helmets, traders arranging bartering, and a Catholic missionary and his helpers working on creating a new settlement were also depicted in Bíró's photos as well.

Bíró used glass plates of 12 × 16.5 cm in size to make photographs. He had a transportable, folding camera with wooden framework made by W. Watson & Sons in London, who manufactured optical & photographic instruments in London, but also distributed their products in Hungary via the Calderoni firm. According to his notes, he indicated that he also used "the photosensitive plate [that] has been on me for 5 years already, no wonder, it did not give a good picture."

Considering the tropical climate, successful laboratory work was extraordinarily circumstantial. The high temperature of the water, as it seldom cooled down to 22-26°C even at night, made development difficult. Drying the plates was also difficult because of the high humidity of the air, and anything that was not completely dried often became mouldy immediately. Therefore, in order to make successful photographs, Bíró made meteorological observations. He measured the temperature of air and water, air pressure, and the quantity of precipitation. He then developed his plates during cooler nights, which allowed him to be able to replace bad quality pictures or damaged plates, if necessary.

Money was always an obstacle for Lajos Bíró. He once made money by selling photo plates of anthropological pictures of Papuans for 3 Marks each to a Ger-

man businessman who was collecting pictures for the Berlin Museum. The value of the pictures was increased by the fact that making such pictures was not simple. Concerned about their souls, local people did not allow photographs, or anthropological measurements of their height, or of their head, etc. to be taken of them. They were afraid of "bewitchment," and frequently ran away from both the camera and ethnographer.

The authenticity of his scientific photos and records is confirmed by his incredibly accurate notes. He documented the exact names of the people, their places of residence, the tribes they belonged to, their social status, and offered references and explanations for the clothes, behaviour, changes in the gesture, such as posture, or even mimicry. Bíró mentioned once, "I did not tell them what to do" and that he "just let them be as they wished." From his scattered notes we can see his working method: he developed the picture, showed it to the models, and then recorded their reaction in writing. In cases of photographed objects and landscapes, the place of origin, the name of the manufacturer, way of manufacturing, and the different parts and types were listed in 3 to 4 native languages. The same procedure was applied concerning the technical details of photographing, for example he numbered his pictures, supplied the brand of the film used, and what time of day the photo was taken and under what kind of circumstances such as "cloudy but sunny" or "sunny." Additionally, he documented the time increments the film was exposed for such as "momentary" or if a "delayed action" occurred, what "iris opening" he was worked with, and he even referred to the photographer's position, like "taken from a speeding train," and also gave the name of the developer. He also supplied reasons for why a photograph would be of a particular quality and he makes references to his experiments, which were aimed at making more perfect pictures. One such instance can be found in the documentations in his notebook describing his series of developing trials. It seems thus obvious that the value of the photographs taken by Lajos Bíró is not merely attached to their subjects like the discovery of the inhabitants of New Guinea and their way of life, but attached as well to his chosen and modern scientific method and the visual notes that accompanied and complemented by detailed textual explanations. This detailed work was not a widely applied practice for etymological and anthropological research at the end of the 19th century.

The original New-Guinean glass plates by Lajos Bíró and the album compiled from their prints, his Diary and the Singapore photo album are preserved in the Budapest Museum of Ethnography. The original, archive pictures, and other pictures made on his later travels to Egypt, and to the caves in Hungary are preserved in the Budapest Natural History Museum.

Klára Fogarasi

See Also: Animal and Zoological Photography; and Ethnography.

BISSON, LOUIS-AUGUSTE (1814–1876) AND AUGUSTE-ROSALIE (1826–1900)

Photographic firm owners (1852–1863)

On September 1, 1856 a British visitor wrote in "The Photographic Record and amateur Guide" that the photographic undertaking of Louis Auguste Bisson (1814–1876) and Auguste Rosalie Bisson (1826–1900) employed about 200 people. Of those, more than 50 constantly travelled through many European Countries taking photographs of which the photographs from Venice were particularly inspiring. The surviving documents from the same year depict about 30 men and women, who worked in the studios and produced latent images. From 1850 to 1860, the Bisson brothers took most of their photographs during the Fall.

In 1841 François Bisson (1795–1865) began to work in his home studio often devoting himself to the daguerreotype. A year later his son, Louis Auguste improved the daguerreotype process in such a way that his portraits became unrivalled in Paris. In 1843 the father and the eldest son opened a photographic studio in the Rue Saint Germain l'Auxerrois, which was well-known throughout Paris. At about that time, Bisson was offered the job of photographing the 900 elected representatives of the National parliament, the Assemblée Nationale. These patrons were wealthy and provided Bisson with a table high advertisement in the likeness of an 1850s panoramic daguerreotype, which was posted over the studio and could be seen from the Seine bank. These patrons also expected a certain quality that forced Louis Auguste to rise to a higher level of professionalism and ingenuity. Both Louis Auguste and August Rosalie established and displayed a most distinct command of photography, which later served as educational parameters and has been disseminated, often having influence on public opinion.

The introduction of the wet collodion process in 1851 in France brought the brothers to the realization that this process, in addition to the others they utilized, would greatly improve their already superior photography. Previously, Louis Auguste had mostly worked with his father in their studio, while August Rosalie had established a studio on Boulevard des Italiens with his partner P.A. Guevin, until 1851. Even though many small studios at the time were becoming established, both Louis Auguste and August Rosalie independently maintained their clientele and popularity because they had unique talents, which transcended to their photography.

Louis Auguste was interested in the technical aspect and had established a better daguerreotype process. He

Bisson, August-Rosalie. The Ascent of Mont Blanc.
The Metropolitan Museum of Art, Gilman Collection, Purchase, Alfred Stieglitz Society Gifts, 2005 (2005.100.54) Image © The Metropolitan Museum of Art.

had also patented a new dip developing process that consisted of bronze or brass on metal. August Rosalie was rather artistically inclined, as seen in his photographs of architecture, and made some of the most beautiful photographs of the 1850s, for example "The Interieur of the cathedral of Rouen" (1858) or the large-sized photographs of Parisian Louvre (about 1854).

Soon, however, the brothers joined efforts because of the great competition amongst the various portrait-studios in the French capital and because although they were already partly paid, the portraits of the elected representatives were still unfinished. Unfortunately due to the revolution of 1848 and the tumultuous internal political disputes, many members left the Assemblée Nationale, and the capital all together. Another reason for forging this partnership was because of the success of Gustave Le Gray's work in the Exposition des Produits de l'Industrie, Paris 1849 in which the Bissons

participated as well, receiving a bronze medal for their photographic prints on paper. The relatively small world of participants of innovative photographic "amateurs" considered every photographic invention as an occasion to think over their own photographic process, to rationalise it, and to try to figure out how to make it better.

Shortly after, the Bisson brothers became the coveted firm for architectural photographs, and not just in France, but post 1854, in Spain and Italy as well. They enjoyed the freedom of independent contracting, but were also wary of working for themselves. Their freedom allowed them to choose the photographic themes and fields, who they worked for and what type of work they did. For instance Auguste Rosalie was employed by the Scientific museum in Paris (Musée d'histoire naturelle), and the Louvre (with Charles Blanc) to make reproductions for a publication on and of the etchings of Rembrandt. Their concern though lay in the fact that their choices and livelihoods were their own responsibility.

In 1854 the Bisson brothers became acquainted with the Alsatian industrial Daniel Dollfus-Ausset, who had been interested in the two photographers since 1849, and asked them to travel to the Alps to take photographs of the glaciers. Dollfus-Ausset researched how the glaciers developed and retreated. Unfortunately, his discovery was criticized in by the scientific community. Auguste Rosalie Bisson's first attempt to reach the summit of Mont Blanc, in August 1859, to photograph the Alps failed. A second expedition in July 1860 became prematurely terminated because of abrupt weather. On July 24, 1861, Auguste Rosalie reached the top and took three photographs. It was written by the photographic journal "La Lumière" that "two very good" and one was simply "good."

In June 1854, the Bissons presented the amazing "Panorama—copie de cour de Louvre," 105 × 45 cm. The panoramic view was created by three compounded negatives, and was used by Dollfus-Ausset to serve his academic purposes at the Academy of Sciences. In August 1855, August Rosalie spent nearly a month in the Alps taking photographs from the mountains and the glaciers. The "Panorama of the Aar-glacier," 182 × 50.5 cm, was one of the first photographic commentaries about a natural glacier. In August 1855, Auguste Rosalie photographed the landscape of an earthquake's aftermath. This first photographic report after an earthquake, depicted the Alps in a way that no one had ever seen and was a sensation in the Parisian photography and scientific circles.

At the end of 1855, the brothers set up a limited partnership with a large contribution from Dollfus-Ausset. Their new commercial address on Boulevard des Capucines was known to be the finest in Paris. The years 1856 to 1858 were the most successful of their historical enterprise. The fast expansion and popularity of the studio attracted even royalty, when in 1858 the emperor, Napoléon III and the empress Eugénie, visited. Participation in international exhibitions, where by their frequent mention by other photographers, perpetuated the idea that the "Bisson frères" were known as one of the most important photographers not only in France, but in Europe as well. The diversity of the Bisson brothers' talent, from reproductions of etchings of Rembrandt's, to the photography of Dürer's architecture, and especially the photographs from the Alps, drew not only artists and amateurs to the luxurious reception rooms on the Boulevards des Capucines, but also large audiences that often wanted their portraits taken. The Bisson brothers became wealthy from these profits and used them to cover all the costs of the photographic expeditions to the Alps.

In the end, both brothers generated little "profit" from those burdensome and life endangering expeditions. Not even one of the photographs from top of Mont Blanc or a composition of Napoléon III was included in the two family albums. In fact, it was rumoured that Auguste Rosalie's successful expedition to Mont Blanc contradicted the reports of his contemporaries, the expedition companions, as well as of the editor of "La Lumière," Ernst Lacan, whose authority remained typically unquestioned. Interestingly, no photographs exist of the failed climb up the Mer de Glace in September of 1860 by Napoléon, Eugénie, and the Parisian Court.

The extensive travels of the Bisson brothers in France, Belgium, the Netherlands, Germany, and Italy as well as the commercially disastrous expeditions in the Alps allowed Dollfus-Ausset to withdraw from the limited partnership "Bisson frères." "Bisson frères" was given 5 years to liquidate their debt, but failures in marketing, opportunities and stubborn independence marked the end of the firm in 1863. On December 29, 1863 the company declared bankruptcy and on January 1, 1864 their photographic studio closed forever.

Milan Chlumsky

Biography

Louis Auguste Bisson was born on April 21, 1814, and died on May 12, 1876 in Paris. Louis Auguste took drawing lessons at home, studied architecture, and later became an architect of the Parisian municipal administration in 1838. In 1841, Louis Auguste was most likely given instruction from Daguerre himself. Enthusiastic about chemistry, he opened a Daguerre studio for portraits with his father. He better developed the procedure by shortening the exposure time. Within three years he claimed six patents, and presented them to the Academy of sciences. In 1847 he established his own studio, and developed an interest in Galvanic plastic. The revolution of 1848 destroyed the basis of the industrial firm that he ran with Armand-Pierre Gaugain.

Between 1848 and 1849 he made the daguerretypes of the 900 members of the Assemblée Nationale. In 1851 Louis Auguste became a founding member of the "Société héliographique." The "photographic print shop" of the Bissons in the Rue Garancière, was next to the industrial area of Paris, which was where the brothers made prints from their own negatives as well as from other colleagues' negatives. In 1855 he expanded his studio up to 3 stories with 5 rooms in which to develop pictures. After he becomes bankrupt, the 59-years old Louis Auguste collaborated with Emile Placet, after which he ended his photographic career.

Auguste Rosalie Bisson, was born May 1, 1826 , and died on April 22, 1900 in Paris. He learned the daguerreotype process from his father and brother. He assisted his brother with the photographs of 900 members of the Assemblée Nationale. In April 1850 he was appointed to the Weight and Measure Office in Rambouillet . For a short time he maintained a photographic studio with Guevin in Paris, where he seldom worked because of his employment in Rambouillet. In 1852 he became a partner with his brother Louis Auguste but left in February of the same year, however he collaborated extensively with his brother before photographing the Alps and Italy. On July 24, 1861, he reached the summit of the Mont Blanc. After going bankrupt in 1863, he established an undertaking with the youngest Bisson, and specialized in architectural photography. In June of 1866 his firm failed, and so became an independent collaborator for other photo studios. In 1868 he again attempted to climb the Mont Blanc for the photographic firm "Léon & Lévy." He travelled to Egypt in 1869 with Edouard Welling. In 1873 he photographed the new halls of Le Louvre for the firm "Goupil," and in 1883 he provided services for "Adolphe Braun & Cie" in the Alsatian Dornach, and accompanied the son, Gaston Braun to Berlin. With this final travel, he ended his photographic career. Auguste Rosalie was also a member of the society of watercolour painters ("Société des Aquafortistes ") in Paris.

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BLACK, JAMES WALLACE (1825–1896)

American photographer and inventor

The son of a carpenter, Black was born in Francestown, New Hampshire, on 10 February 1825. Apparently orphaned as a teenager, he worked in a Lowell, Massachusetts tannery and then in the town's Boott Cotton Mills from 1842 to 1844. In 1846 he learned daguerreotypy from John A. Lerow in Boston and then served as an itinerant photographer for several years before returning to Boston to work for L.H. Hale & Company where he operated the rotary buffing machine used to polish the silver-coated daguerreotype plates. Black partnered briefly with Loyal M. Ives and then began apprenticing with John Adams Whipple around 1850 at 96 Washington Street. He became a full partner in 1856 and until 1859 they operated under the name of Whipple & Black. At the height of its success, their studio rivaled that of the well-known firm of Southworth & Hawes with whom they maintained a healthy competition.

One of the mainstays of any photographic business in the nineteenth century was portraiture, and Black was well known for his ability to secure the best moods and expressions in his clients due to his "natural courtesy and gentlemanly attention." However, Black seems to have been more interested in composition than in capturing the psychology of his sitter, favoring pyramidal compositions and massing of figures that enabled him to play with positive and negative space.

This experimentation with composition is reflected in a project he undertook in 1854 to photograph the landscape of his native New Hampshire. Taken fifteen years before the great landscape photographs of the American West, Black's photographs represent some of the earliest views taken with the glass negative/paper positive wet plate process, in this case, the crystalotype process pioneered by Whipple and which Black was instrumental in improving. According to art historian Sally Pierce, while the resulting salted paper prints lack the sharpness, detail, and sense of depth that can be found in albumen prints, they have a textural quality that works well in capturing the rugged landscape of the New England countryside.

For unknown reasons Whipple and Black dissolved their partnership in 1859. After leaving Whipple, Black purchased the studio of J.B. Heywood at 173 Washington Street and in 1860 formed a partnership with itinerant daguerreotypist Perez M. Batchelder. The new firm was known for its high-quality cartes-de-visite and stereo views and was praised for the artistry of individual and group portraits.

In 1860 Black attempted to take aerial views of Providence, Rhode Island, but had difficulties developing the wet collodion plates in the makeshift darkroom he set up in the basket of the balloon. In October of the same year, he produced six successful negatives of Boston, including views of the downtown and waterfront, from a balloon tethered above the Boston Common. These were the first aerial views taken in America, a feat that was well publicized in the photographic journals and local papers.

In 1861 Black began experimenting with using porcelain as a photographic support. The process was praised for its softness, delicacy and resistance to fading, and taken up by other photographers in the area, including Whipple.

After his partnership with Batchelder dissolved in 1862 Black continued the business on his own for several years and was quite successful. He expanded his studio space into another building and, according to contemporary accounts, employed anywhere from three to sixty assistants. An 1863 advertisement from the Boston Directory describes the firm's services: cartes-de-visite and life size portraits in oil, pictures finished in India ink and watercolor, an operating room that could accommodate large groups, the copying of daguerreotypes, and cartes-de-visite "enlarged and finished in any style, and in the most perfect manner." Black was also known for his generosity in showing people, including other photographers and inventors, around his studio.

John G. Case was Black's partner from July 1864 through February 1867. During that period they did an extensive business at the Boston location and also operated a studio in Newport, Rhode Island. In 1864 there were about seventy photographers operating studios in Boston. One contemporary observer claimed that Black's was the largest, occupying a "wilderness of rooms" and employing as many as sixty people. There were 40,000 negatives, nearly twenty tons of glass according to this observer, stored throughout Black's establishment at 163 and 173 Washington Street.

Among Black's best-known photographs are views of the Great Boston Fire of 1872, which destroyed over one thousand buildings in the city's commercial district. His studio on the north side of Washington Street was saved, but all the buildings across the street were gutted. Black made over 150 large and small albumen prints of the destroyed "burnt district" that he sold for $3.00 and $1.50 respectively. He also made magic lantern slides of the ruins. Although many photographers took pictures of the fire's aftermath, those by Black were widely published both nationally and abroad and compiled by Black in *Ruins of the Great Fire in Boston. November 1872* (Boston, 1873). As Pierce has noted, the images are successful because of their unique point of view: rather than photographing large areas of damage, Black focused on architectural structures and unusual details such as piles of wet clothing and included people in his views to emphasize the devastation caused by the fire.

In 1874 the firm name was changed to Black & Co. and in 1876, Black's assistant John L. Dunmore became a partner. In the later years of his photographic practice, Black and his partners created large format images of a variety of subject matter, including military subjects, factories, public buildings and residences, special events, and works of art. Black began to experience financial difficulties in the second half of the 1870s, but continued working until his death from pneumonia on 5 January 1896. His son Otis Fisher Black took care of the studio's business affairs until its close in 1901. Selections of Black's work can be found in the following collections: *Boston Athenaeum, Boston Public Library, Bostonian Society, Massachusetts Historical Society, Society for the Preservation of New England Antiquities, and the International Museum of Photography, George Eastman House*.

MICHELLE LAMUNIÈRE

Biography

Black was born on 10 February 1825 in Francestown, New Hampshire. He first learned daguerreotypy from John A. Lerow in Boston in 1846, but his most important affiliation was with John Adams Whipple with whom he partnered from 1856 to 1859. Black married Frances Georgianna Sharp, the daughter of painter and lithographer William Sharp, on June 9, 1859. Their two surviving children, Olive P. Black and Otis Fisher Black, were born in 1861 and 1867 respectively. In addition to his portrait work, Black's noteworthy projects include New Hampshire landscapes, aerial views of Boston, and documents of the aftermath of Boston's Great Fire (1872). For nearly thirty years beginning in 1856 he contributed regularly to the exhibitions of the Massachusetts Charitable Mechanic Association, frequently receiving awards. He was also active in the National Photographic Association and a founding member of the Boston Photographic Union, later renamed the Boston Photographic Association. Black died in Cambridge, Massachusetts, on 5 January 1896.

See Also: Whipple, John Adams; Southworth, Albert Sands, and Josiah Johnson Hawes; and Carte-de-Visite.

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BLACKMORE, WILLIAM (1827–1878)

William Blackmore was born in Salisbury, England in 1827. Having trained as a lawyer, he moved to Liverpool in 1848 and joined a firm of solicitors. He prospered and by the 1860s was one of the leading figures in the business of land grants in the American West, specifically in Colorado and New Mexico.

Blackmore had been interested in Native Americans since his teenage years and believed that photography was the best medium for recording the rapidly vanishing Native American communities and set about creating an archive of such images. He purchased photographs and commissioned photographers, both to copy photographs or to photograph Native Americans in their natural habitats or when their leaders visited Washington D.C. as part of delegations. Blackmore also published two sets of photographs of North American natives.

The work of some twenty-eight photographers were to be found in Blackmore's photographic collection. These included Antonio Zeno Shindler (d.1899), Alexander Gardner (1821–1882), William Henry Jackson (1843–1942), and Dr. William Abraham Bell (1841–1920).

In 1867 Blackmore's photographs were copied by Antonio Shindler to help prepare the catalogue for the Smithsonian Institutions first photographic exhibition in 1869, *Photographic Portraits of North American Indians in the Gallery of the Smithsonian Institution.* In 1872 the Smithsonian established a relationship with Blackmore to assist his project.

Blackmore's business ventures failed in the 1870s and he committed suicide in 1878. His collection, held in Salisbury after his death, was dispersed from the 1930s. The British Museum now holds Blackmore's core photographic albums of some 2000 images.

ANTHONY HAMBER

BLAIR, THOMAS HENRY (1855–1919)

Canadian photographer

Canadian-born Thomas Henry Blair arrived in America in 1873 from Nova Scotia, to earn his living as an itinerant tintype photographer.

He took up the already obsolescent wet collodion process, and filed a patent for the *Tourograph* camera in 1878, which folded into a box for carrying, and when assembled for use combined a camera with a small darktent for the preparation and processing of the plates. The camera was made for him by the American Optical Company, a division of the Scovill company.

The Blair Tourograph and Dry Plate Company, was established in 1881. With facilities in Boston, New York, Cincinnati and San Francisco, the company advertised that "Photography with Blair's Cameras becomes a Delightful Pastime." The *Boston Detective Camera* of 1884, and the *Lucidograph* of 1885 were just two of their successful designs.

Blair shortened the company name to the Blair Camera Company in 1886, but within a few years his interest in flexible film took him back into materials manufacture eventually becoming a major manufacturer of celluloid film in the 1890s, and also of roll-film holders and cameras—in direct competition to George Eastman. Blair's 100-exposure Kamaret camera was a direct rival to the Kodak, and the two companies were on a collision course.

Ousted from the management of his own company, Blair moved to Britain and established the European Blair Camera Company in London.

In America, the original Blair company was sold to Eastman in 1900, becoming the 'Blair Camera Division of Eastman Kodak.'

JOHN HANNAVY

BLANCHARD, VALENTINE (1831–1901)

Valentine Blanchard first exhibited at the Dublin International Exhibition of 1865, at which time he had a studio in London's Camden Town, having previously briefly been based in the Strand in the late 1850s.

By 1862, he had developed a technique for achieving very short exposures with his stereoscopic camera, producing popular instantaneous images of the bustle of London street life. Throughout the decade, his catalogue of stereoscopic cards was extended, covering every area of London.

An explosion at his Camden studio in 1870, probably caused by guncotton igniting, necessitated relocation, and he is listed at an address in Piccadilly from 1871 until 1875, thereafter at 289 Regent Street, the address on many of his surviving portraits.

Blanchard was a prolific writer on photography, contributing articles and opinions from 1860, and consolidating his reputation. In his book *The Silver Sunbeam*, published in 1863. John Towler refers to his formula for bromo-iodised collodion. By the 1870s, it was his portraiture rather than his urban landscapes which were being widely praised, with particular recognition being accorded to his control of diffuse lighting, and his use of a soft-focus lens.

After closing his London studios, he was elected a member of the Brotherhood of the Linked Ring's first meeting in 1892, and exhibited widely for much of the remainder of his life.

JOHN HANNAVY

BLANQUART-ÉVRARD, LOUIS-DÉSIRÉ (1802–1872)

French photo publisher, inventor, photographer, and essayist

Louis Désiré Blanquart-Évrard's name remains indelibly associated with the "imprimerie photographique" (photographic printing factory) he opened in 1851 in Loos-lès-Lille. This facility was the first of its kind in France, and the first in the world operating at such an industrial level. The printing workshop William Henry Fox Talbot established in Reading (England) in 1844 was not on the same level. Blanquart-Évrard was a photographer himself, as well as an inventor. On the basis of his important essay *La photographie, ses origines, ses progrès, ses transformations* (1869) he deserves also be considered a photo-historian.

Blanquart-Évrard was born in Lille on August 2nd 1802. Around 1826, he studied with an influential, young chemist, Frédéric Kuhlmann (1803–1881). Soon, he was an assistant in his teacher's laboratory. This background in chemistry became crucial to his future in photography. He also practiced painting, chiefly miniature painting on ivory or porcelain, earning a few awards in local exhibitions. It remains unclear when Blanquart-Évrard became interested in photography. Like many others involved in art and science, he seemingly reacted enthusiastically to the announcement of Daguerre's invention in 1839. Around 1844, he heard about Talbot's negative-positive process, and, from that moment on, devoted himself to perfecting this technique.

Blanquart-Évrard's first important results attracted public attention in December 1846, when he submitted several prints to the Académie des Sciences in Paris, and in January 1847, when he was invited to present his research. The academy warmly supported Blanquart-Évrard's work, summarized in a treatise he published the same year. Though he didn't explicitly acknowledge it, his process was very close to Talbot's, but he improved it in many respects. The main difference was that Blanquart-Évrard sensitized the paper by floating it into the silver solution instead of merely applying it superficially with a brush. Soaked with the solution, the sheet became more sensitive, and the proofs more accurate and stable than Talbot's. Later, in 1849, Blanquart-Évrard experimented with glass plate negatives prepared with albumen; one year later, he applied this process to paper negatives.

From the beginning, Blanquart-Évrard's work was aimed toward adapting photography to industrial production. His whole research was made in view of achieving this goal, and the creation of a photographic printing factory. There was a growing interest for this project in French photographic circles. The Société Héliographique (created January 1851, later Société française de photographie, SFP), was the locus of intense debate on the topic, as reported in their journal *La Lumière*. A photographic printing factory was envisaged as a major instrument for the progress of dissemination of photographs, making possible the publication of photographically illustrated albums, books and magazines—the dream of a future when photography would play a major role in visual communication. Not only focusing on technical features, Blanquart-Évrard also insisted on economical issues. According to his analysis, three conditions were necessary for such a factory to be profitable [*La Lumière*, April 13, 1851: 37–38]: ability to produce regardless of weather ("not to depend upon the vagaries of sun"); capability of supplying large quantities in a short time; and a price attractive to publishers. Blanquart-Évrard's motto was: "produce quickly, good quality, and cheap." He estimated that within one workday one could obtain 200 to 300 prints from a single negative, for 5 to 15 cents a piece, according to size. Moreover, provided the factory was well organized, 30 negatives could be treated in a single day, thus producing 5,000 to 6,000 prints. However, these estimates proved to be too optimistic.

From a technical standpoint, Blanquart-Évrard found the way "not to depend upon the vagaries of sun." Instead of a long exposure depending on weather conditions, he used the property of the latent image, which could be obtained in few minutes, then developed and fixed. The developing method represented a major advance. It provided more stable prints, too. Blanquart-Évrard submitted it to the Académie des Sciences in April 1851 and improved it constantly. He also presented it at the 1851 London exhibition, and explained in a new book, *Traité de photographie sur papier*. Once more, Blanquart-Évrard adapted Talbot's work, for Talbot had already used the latent image principle to obtain his negatives, but not positive prints.

Late in getting started, Blanquart-Évrard was overtaken by Eugène Piot, who released the first installment of his *Italie monumentale* portfolio in June 1851. Francis Wey praised Piot's success and blamed Blanquart-Évrard for being overly concerned with theory and too little with practice [*La Lumière*, August 17, 1851, 107 and 111]. Remarkably, Wey compared Piot's prints to "beautiful and large mezzotint engraving," thus emphasizing the nascent competition between photography and traditional printmaking for the market of illustrated publications. Eventually, Blanquart-Évrard's long-awaited *imprimerie photographique* officially opened in September 1851. As stated in an advertisement in *La Lumière* (September 28, 1851), its mission was "to propagate photography on paper by an abundant reproduction of prints."

Blanquart-Évrard's first publication bore the programmatic title *Album photographique de l'artiste et de l'amateur*. It was conceived as "a frame within which all the applications of the new discovery would gather," thus echoing the purpose of Talbot's *Pencil of Nature*. While many of the 36 plates remain unidentified, it comprised photographs by Baron Alexis De la Grange, Alphonse de Brébisson, Maxime du Camp, and Charles Marville. Architectural views (taken in France, Italy, Belgium, India, and Jerusalem) mingled with a Lebanese landscape by Ernest Benecke and reproductions of artworks. Art reproductions would be the subject of the second album, *L'art contemporain*, reproducing twelve paintings exhibited at the Salon in 1853, photographed by Hippolyte Bayard and F.A. Renard. In total, Blanquard-Évrard published 24 albums, of which Isabelle Jammes established a 555 entries catalogue raisonné (see "further reading"). They included masterpieces by Charles Marville—Blanquart-Évrard's principal photographer and the author of the most important monographs he published, *Les Bords du Rhin* (1853, 28 plates)—Henri-Victor Régnault, Henry Le Secq, Thomas Sutton, and Louis-Rémy Robert. It is most likely that some of the unsigned plates can be credited to Blanquart-Évrard himself (especially the three plates of *Paysages de Flandres*, 1853, according to Jammes); unfortunately, little information exists on his own photographic practice. The general publishing policy remained more or less the same as set by the *Album photographique de l'artiste et de l'amateur* (architectural views and reproductions of works of art, with some landscapes), with the exception of few genre scenes.

As anticipated, other publishers commissioned Blanquart-Évrard for the printing of negatives they wished to publish. This was especially the case with Gide & Baudry, a powerful publishing company specialized in travel accounts, archaeology, and scientific literature. Blanquart-Évrad executed the prints for two landmark photographic books they published, Du Camp's *Egypte, Nubie, Palestine et Syrie* (1852, 125 plates) and Auguste Salzman's Jerusalem (1856, 174 plates). Du Camp's album was a success, and about 200 copies were manufactured. A few of his photographs were also included in Blanquart-Évrard's own publications. Blanquart-Évrard also printed John B. Greene photographs on Egypt, gathered in *Le Nil*, a self-published album (1854, 94 plates).

Though groundbreaking and well planned, Blanquart-Évrard's venture was destined to fail. He underestimated the operating costs, and the photographic prints remained too expensive to produce, thus to sell. Instead of the few cents estimated in the Spring of 1851, he would ask 6 francs for the first 16x20 cm print, with the next from the same negative priced at 2 francs each. Consequently, *Album photographique de l'artiste et de l'amateur* plates (available individually, which was the case for all his publications) sold for 6 francs each. Moreover, even if Blanquart-Évrard's process was one of the best, salt paper prints were still not considered to be stable enough. The public was not ready to pay such prices for prints that might fade; a lithograph was much cheaper. Blanquart-Évrard cut prices down about 50% in 1854, but it was too late. The *imprimerie photographique* closed in 1855. By this time, other publishers like Goupil had stopped publishing photographs (mostly printed by H. de Fonteny, Blanquart-Évrard's most serious competitor)—though they would resume this activity in 1858, focusing on their own niche, reproduction of artworks, and using albumen prints, which were more stable than salt paper prints. In September 1855, Blanquart-Évrard formed a partnership with the English photographer Thomas Sutton. They opened the Establishment for Permanent Positive Printing in Jersey. It closed in 1857.

A major figure of the development of photography in the golden decade of the 1850's, Blanquart-Évrard devoted the rest of his life to new research (including color photography). In 1863, he published an important treatise, *Intervention de l'art dans la photographie*, in which he described the negative as raw material begging to be interpreted by the photographer, modulating shadows and highlights, in order to obtain a relevant and valid artwork. Such a conception predated the pictorialist aesthetic. But Blanquart-Évrard's main achievement after the Loos-lès-Lille factory closed was his major book, *La photographie, ses origines, ses progrès, ses transformations* (1869), in which he gave an accurate account of the first three decades of photography. Ironically, his book contained original silver prints, at a time when photo publishing as he had envisioned it was definitively threatened by the advent of photomechanical processes.

Pierre-Lin Renié

See Also: Archaeology; Architecture; France; Permanency; Photographic publishers; Photography of paintings; Photography and reproduction; Talbot, William Henry Fox; Daguerre, Louis-Jacques-Mandé; Société Française de Photographie; Piot, Eugène; Wey, Francis; De la Grange, Baron Alexis; de Brébisson, Louis-Alphonse; Du Camp, Maxime; Marville, Charles; Benecke, Ernest; Bayard, Hippolyte; Régnault, Henri-Victor; Le Secq, Henri; Sutton, Thomas; and Robert, Louis-Rémy; Salzman, Auguste; Greene, John; and Goupil & Cie.

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BOCK, THOMAS (1790/93–1855) AND ALFRED (1835–1920)

Australian photographers and studio owners

Thomas Bock, born 1790/1793 in Birmingham was trained as an engraver and miniature painter. He was transported as a convict to Van Diemen's Land in 1823. After being pardoned, he again pursued painting and engraving as well as lithography, teaching his stepson Alfred and son William the arts. While continuing to paint mostly portraits in 1847 Thomas opened Hobart's first established daguerreotype studio at 22 Campbell St. that he operated until his death on 18 March 1855. Alfred who had taken the only know photograph of his father in 1847 assumed control of the studio, helping to support his family. He moved the business not long afterward to 78 Liverpool St., taking over the premises vacated by Duryea and McDonald, then moved to 18 Macquarie St. in 1857, but he became insolvent the following year. Later during 1858 he reopened a studio at 140 Elizabeth St., called The City Photographic Establishment. Alfred offered ambrotypes, and later *carte-de-visite* and also sennotypes. He continued trading until 1865, before again declaring insolvency. In 1867 Alfred Bock moved to Gippsland, Victoria on account of his wife's health, opening a studio in Sale. In 1882 he moved to New Zealand and ran a studio in Auckland for six years, but he returned to Victoria in 1888, working there until 1899 when he went back to Tasmania where he worked until 1914. Alfred died in Wynyard in 1920. William Bock became a revered engraver working mostly in New Zealand where he was amongst other things heavily involved in postage stamp production.

MARCEL SAFIER

Holdings

Allport Library and Museum of Fine Arts, Hobart; W.L. Crowther Library, Hobart; State Library of Victoria, Melbourne; National Gallery of Australia, Canberra. House, 1955.

BOGARDUS, ABRAHAM (1822–1908)

American photographer and gallery owner

Born 1822 in upstate New York, Bogardus learned daguerreotyping in the George Prosch Gallery in New York, in the mid-1840s. He opened his own gallery 1846 in lower Broadway, and later operated galleries in both New York and New Jersey.

Bogardus worked aggressively against patents limiting daguerreotype photography, & the 25 cent "cheap workers." He photographed in all of the various mediums over the years, including carte, wet plate, etc. He was the first President of the National Photographic Association, in 1869, and was re-elected seven times.

When he left photography in 1884, after four decades, a journal of the day said of Bogardus: "Everyone knows him well as one of the heartiest, jolliest, best-natured, whole-souled men in the trade. His success was great & he did an immense business….employing thirty assistants. During his experience he has taken the portraits of four Presidents and nearly all of the houses of Congress. He is a fine looking and large gentleman, with full grey beard; his after dinner speeches are much applauded."

After retirement he painted off-and-on and died in Brooklyn in 1908. Primary institutional holdings include The George Eastman House, and The National Museum of American History.

LARRY WEST

BOLAS, THOMAS (1848–1932)

Born in London in 1848, Bolas trained in chemistry at Charing Cross Hospital working under Professor Charles Heaton and with Dr. John Stenhouse. From 1872 he undertook private chemical work, lectured extensively, published his own research and worked

as a scientific journalist across several different fields. He coined the term 'detective camera,' demonstrating his own design in 1879 and edited several important photographic periodicals during the 1880s and 1890s and authored a number of popular photographic books. He died in Wimbledon on 1 March 1932.

Thomas Bolas was born in 1848 and in 1862 he entered the laboratory of the Medical School of Charing Cross Hospital working under Charles W Heaton who had just been appointed professor of chemistry. He remained at the hospital until 1876 becoming a member of the teaching staff and spending much of his time between 1865 and 1872 in the laboratory of Dr John Stenhouse FRS where he also worked alongside Raphael Meldola, a later photographic chemist and author.

From 1872 Bolas was primarily involved in private chemical practice and scientific journalism in particular in the fields of photography, printing, glues, rubber and railways. He was a regular contributor the *Journal of the Chemical Society*, *Chemical News*, the *Journal of the Photographic Society*, *Photographic News,* and other technical journals as well as a frequent lecturer across all these subjects. He delivered the Cantor Lectures to the Society of Arts on Photography in 1878, on India Rubber (1880), Industrial Uses of Calcium Compounds (1881), Photo-Mechanical Printing (1884) and Stereotyping (1890). He was a Fellow of both the Institute of Chemistry and Chemical Society. He was the author of an article on Indiarubber (*sic*) for the ninth edition of the *Encyclopaedia Britannica* and produced a handbook on glass blowing, an area in which he was particularly skilled, in 1898.

Photography seems to have been a particular interest to Bolas at a time when it was still possible for individuals to make contributions to photographic chemistry and theory outside of a formal academic or commercial laboratory. He joined the Photographic Society in 1875 and played a prominent role in the Society's activities for many years.

Bolas constructed and demonstrated a hand or 'detective' camera at the Photographic Society in late 1880 which he had designed to make use of the newly introduced and more sensitive gelatino-bromide plates. The design which was reported in the *Journal of the Photographic Society* on January 21 1881 described a camera with separate viewing and taking lenses (essentially a twin lens reflex camera) enclosed within a wood box with room for thirteen double dark slides. The camera measured 12 inches square by 5 inches deep and Bolas showed photographs of London street life taken with it. The camera's design ensured that it could be used without being detected by the subject and the design was taken up by the Criminal Investigation Department of Scotland Yard. The camera was further refined by Bolas who introduced a cylindrical shutter to the camera which was the subject of a provisional British patent number 4823 of 3 November 1881. The term 'detective camera' coined by Bolas was quickly adopted by other makers of box form hand cameras and was widely used until the late 1890s. Bolas's own design does not appear to have been produced commercially and other similar designs, notably the Schmidt Detective camera patented in the United States in 1883 and numerous British designs quickly achieved popularity.

Bolas experimented at an early date with using burning aluminium leaf metal in oxygen in 1893 although little was to come of this for widespread photographic flash lighting until 1925. In conjunction with a lecture-demonstration on 'The Physics and Chemistry of Development' given by him at the Cordwainer's Hall on 11 March 1895 to the Photographic Society and published in the *Journal* on 30 April1895 Bolas made the first Hertzian or wireless signal transmission in the City of London.

Bolas edited the *Photographic News* from 1884, after Henry Baden Pritchard's death until 1891 during which time he gave the journal a greater emphasis on the science of photography. He edited the associated *Year Book of Photography* from 1885 until 1893. He also published his own journal *The Photographic Review* from 6 July 1889 until 18 January 1890 to provide 'a weekly commentary on photographic progress.' Publication resumed from February 1890 with a new editor and publisher. He edited the seventh and eighth editions of *Wall's Dictionary of Photography* and wrote two popular books for the large photographic retailer and manufacturer Marion & Co.: *The Photographic Studio. A Guide to its construction, design and the Selection of a Locality* (1895) and *A Handbook of Photography in Colours* (1900). He also wrote other photographic books.

Bolas was described by the British *Journal Photographic Almanac* as 'a most original character with an immense fund of knowledge and whimsical humour' with an encyclopaedic knowledge of photographic and photo-mechanical work.

He ceased to be a member of the Royal Photographic Society several years before his death and made few contributions to photography in the twentieth century. He died in Wimbledon on 1 March 1932 aged 85 years.

MICHAEL PRITCHARD

BOLDYRJEV, IVAN VASILJEVICH (c. 1848–1898)

Amateur photographer, inventor

Ivan Vasiljevich Boldyrjev was born into the family of a Don kazak. In the sources one can find various dates of birth, from 1848 to 1850. When he was 18 years old he moved to Novocherkssk and became apprentice photographer at a studio.

In 1872 he moved to St. Petersburg. During this time, only low depth lenses were used in photography studios. Boldyrjev, with no special knowledge of optics, simply by combining elements, created a short-focus, large aperture lens which enabled him to make high ly detailed photographs of large groups. The characteristics of this lens made possible photograph under poor light, while retaining good depth of field. As Boldyrjev did not patent his design, the precise configuration of the elements is not known, although images taken by the lens survive.

In 1878 the fifth department of Russian Emperor's Technical Society in Saint Petersburg (RETS), the photography department, was established by a group of photographers including Boldyrjev. The first public meeting of the society was devoted to the discussion of technical potentialities of the lens. Photographic test were carried out in the studio of the famous photographer, Andrey Denier, and in the presence of such Russian authorities in photography like Sergey Levitsky and others. Being aware of the typical problems of studio photography, they stood in the depth of the hall at about 8.5 meters from the photographer thus trying to create the maximum hard photographic conditions. As a result, they got a photograph of high acutance on the foreground as well as on the background with the linear perspective wonderfully rendered. Nevertheless, even the positive results of the experiment didn't gain approval of the specialists.

In 1875, Boldyrjev returned home and developed an interest in photographing the Don kazaks' way of life with his lens. Some Russian photographers had already created superb ethnographic photographic series, for instance, William Carrick made a series of photographs in the Simbirsk region in 1870s.

Boldyrjev's camera recorded scenes of folk life with its routine and holidays, and the same scenes Boldyrjev witnessed in his childhood. The lens he used made his photographs multidimensional, so the images seemed to be snatched from real life as there was practically no posing or staging by the photographer. His photographs combined reality with refined taste, and artistic rendering of life filled with energy is found in his works. He only used photographic methods and thought of the reality of his photography as an expressive means. Choosing different plots from the lives of common people, Boldyrjev tried to get away from posing and costumes and instead sought reality in his works. Additionally, one of Boldyrjev's techniques was to render linear and aerial perspective and consciously employ depth as an expressive device.

His photographs were highly regarded by a leading Russian art critic of the time, Vladimir Stasov. He even bought an album of prints for the collection of the Emperor's Public Library in St. Petersburg. Stasov mentioned, "The 75 pages comprise not only neighborhoods and people that are very interesting and are brilliantly done, but also picturesque and so naturally presented groups of the Don kazaks, men and women, at their field and house work, at service. Lots of the groups are real "true life pictures" created by an artist of talent."

Boldyrjev was one of the pioneers of Russian realistic photography and the aesthetic principles he lived up to were later developed by some other prominent photographers in the trend, such as Maksim Dmitrijev. Differences about the assessment must have led to the tense relationship of Boldyrjev with the members of RETS.

Boldyrjev kept inventing and making photographs. Because he traveled round Russia frequently he often felt uncomfortable using fragile glass negatives. It was out of this concern that he had the idea of inventing a flexible photographic. In 1881, following a period of diligent work and experiments, he invented flexible film for negatives, which he presented at the All-Russia Industrial Exhibition in Moscow in 1882. The film was an plastic transparent film that was resistant to high temperature and humidity. It is regretful that neither the description of the chemical elements of this kind of film survive, nor photographs take with this film, as Boldyrjev didn't patent this either. Only the basic review of its properties, mentioned in the newspaper *The All-Russian Exhibition* (No. 30 1882) exist: the film was a flexible resin-like plate, similar to glass by its density and transparency. This plate did not deform while being rolled up into a tube. The well-known chemist D. Mendeleev expressed his approval of the film. Vyachjeslav Sreznevsky, a famous Russian expert in photography labeled the film as "a rather useful invention," even though the invention was not commercially implemented.

However the fifth department of RETS paid due attention first to Eastman's paper-based film that entered the market in1885 and then to Hannibal Gudwin's (1822–1900) celluloid film, which he patented it in 1887, and then to the first mass produced sheet films in 1888. The photography press was full of reviews of Russian photographers who admired the films produced abroad and the advantages of using them for outdoor photography.

As Boldyrjev didn't find much support as far as his inventions were concerned, he kept taking photographs. The range of events he recorded in 1870–1890s was really wide. In the funds of Russian National library in St. Petersburg, the former Emperor's Public library, there are photographs of physiological experiments in the hospital named after S. Botkin, where Ivan Pavlov worked as a young man, of curing séances through electroshock therapy in the Military medical academy in St. Petersburg. One can also find photographs of the celebration of Rafael's 400th anniversary at the Russian

Academy of Fine Arts, as well as expositions of the peredvizshniks and some photographic portraits.

In 1880 V. Stasov ordered a series of photographs for the "Bakchisaraisky palace" album from Boldyrjev. Bodyrjev went to the Crimea and made brilliant photographs of the facade and the interior of the Bakchisaraisky palace as well as a couple of marvelous landscapes. Currently, these photographs are in the collection of the St. Petersburg Public library.

In 1889 at the World exhibition in Paris, Boldyrjev was awarded a certificate of merit for his works and in 1898, at the fifth exhibition of RETS he received a diploma for photographs made in lamp light and night photographs of illumination.

Boldyrjev was a drawing teacher by profession and therefore he reckoned himself among photographic amateurs. Still though, some photographers considered him to be a professional. In 1883 and 1886 he issued a booklet called "Inventions and improvements in photography made by Boldyrjev. In this booklet Boldyrjev describes his findings in a rather detailed way. Boldyrjev died in 1898 in St. Petersburg.

Boldyrjev's creative activity was not estimated at its true worth by his contemporaries. However, his works did much for the advancement of photography as an independent art form because he developed purely photographic expressive images.

ALEXEY LOGINOV

Biography

Ivan Vasiljevich Boldyrjev was born in Ternovskaya stanitsa into the family of a Don kazak. His birth is unknown, but sources indicate dates of birth from 1848 to 1850. When he was 18 years old he moved to Novocherkssk and became an apprentice photographer at a studio. In 1872 he moved to St. Petersburg, where he worked at the studio of Alfred Lorens and visited at leisure the drawing school of the Society for Fosterage of Artists. After leaving Lorens' studio Boldyrjev became a non-credit student of St. Petersburg Academy of Art. At the same time he became interested in photography as an amateur. By combining lenses Boldyrjev created a short-focus lens. In 1875 he employed the new lens in making photographs of the land where he was born. He made photographs of scenes of traditional folk life. On returning to St. Petersburg Boldyrjev decided to present the lens he invented at the meeting of the fifth department of Russian Emperor's Technical Society (RETS). In1881 he made first flexible film to use instead of glass plates and demonstrated it at All-Russia industrial exhibition in Moscow in 1882. Boldyrjev didn't enjoy the support of his contemporaries as far as his inventions were concerned, and kept making photographs of the wide range of events in the life of his country in 1870–890s. Boldyrjev died in St. Petersburg in 1898. He was one of those who developed the foundation for realistic photography in Russia and introduced the aesthetic principles further developed by other prominent photographers of the trend.

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BONAPARTE, PRINCE ROLAND (1858–1924)

Prince Roland Bonaparte was great nephew of Napolean Bonaparte. Barred from a military career he took up science and was taught by the distinguished French

Bonaparte, Prince Roland Napoleon. Betty, Fillette Hotentotte (Hottentot Girl), 9 ans. from album "Boschimans et Hottentots"
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

physical anthropologist Paul Broca. His photography was a central part of his wide interest in anthropology, geography and natural history on which he published extensively. He is best remembered for his anthropological photographs. Many of them were undertaken at the various international exhibitions of the late nineteenth century. He photographed and measured indigenous people from Surinam at the Amsterdam Colonial Exhibition (1883), the Omaha Native Americans and and Kalmouks at the Jardin d' Acclimitation (1884), and Australian Aboriginal people toured by Cunningham as 'exotics' (1885) who were appearing at the Folie Bergère. He also undertook similar photography during his scientific travels. In 1884 he went to northern Scandinavia where he photographed the Saami people and in 1887 he travelled to North America and Mexico. His photographs were published privately as portfolios of mounted albumen prints, stamped with Bonaparte's coat of arms. Focussing on a specific cultural or racial group, each portfolio was accompanied a pamphlet of names ages and basic anthropometric information. These portfolios were presented to scientific societies around the world.

ELIZABETH EDWARDS

BONFILS, FÉLIX-ADRIEN (1831–1885), MARIE-LYDIE CABANIS (1837–1918), AND ADRIEN (1861–1929)

French photographers and photo publishers

Born on 8 March 1831 in Saint-Hippolyte-du-Fort (Gard, France), Félix Bonfils was a bookbinder-turned-photographer. Little is known about his beginnings. Although there is no contemporary confirmation, he is believed to have opened a studio in the nearby town of Allais in 1864, and in 1866–67, he apparently perfected his technique with Abel Niépce de Saint-Victor. This was just before embarking on what would become the adventure of his life, the creation in 1867 of a photographic studio in Beirut, soon to be known worldwide.

Félix married Lydie Cabanis in 1857. Both traveled to Lebanon before 1867, Félix as a soldier in 1860, and, a few years later, Lydie accompanied their son Adrien, who was recovering from illness. These sojourns prompted them to settle in Beirut. From 1864 to World War I, the city was the capital of "Mount-Lebanon," a Syrian autonomous province under Turkish domination, but administrated by a catholic governor approved both by Turkish and European governments. Mount-Lebanon was prosperous, peaceful, and at the very heart of a multicultural Middle East. Another European photographer, Tancrède Dumas, settled in Beirut in 1867, but while most of guidebooks for tourists mention both studios, they favor Bonfils works as better.

In December 1871, Félix Bonfils reported his achievements to the Société Française de Photographie: he had no fewer than 15,000 albumen prints in stock, obtained from 590 negatives made in Syria, Palestine, Egypt, and Greece. This core ensemble also comprised 9,000 stereographic cards. In 1876, the flourishing company published its first official catalogue, listing 395 views of various Mediterranean sites explored before, with the notable addition of Constantinople. In addition, the catalogue featured 33 "Diverse Costumes," actually types ranging from "Arab Musicians" (no. 240) to "Turkish Woman" (no. 261), and 537 stereographic views, 99 of them devoted to costumes. Other catalogues were published c1885 (F. Bonfils & Cie), 1901 (A. Bonfils), 1907 (Veuve Bonfils), and c1925 (Photographie Bonfils, A. Guiragossian Successeur).

Retailers were mentioned for the first time in the c1885 catalogue. Apart from Beirut, Bonfils' photographs were available in Paris and London, in Egypt (Cairo, Alexandria, and Port-Said), and in Damascus. One important distributor was not mentioned, because their collaboration had ceased by 1885. As early as 1872, Bonfils contracted with an American publisher, Charles Taber & Co., of New Bedford, Massachusetts. Nothing is known about the terms of their contract, but Taber actually published the first Bonfils catalogue. In 1872, four years before Bonfils' catalogue was published, Taber & Co., the "Sole agents for the United States," released their *Catalogue of Views in the East, Egypt, Palestine, Syria, Greece (Original), 9 × 11 inches, on 16 × 20 mounts, and Stereoscopic Views of Palestine from New Original Negatives by Bonfils, Photographer, Beirut, Syria*. The catalogue listed 367 views and 158 stereocards, available in the United States, for almost a decade. Taber's next catalogues mentioned Bonfils photographs until 1881. As a result, many of Bonfils' prints in various repositories in the United States, such as the University of Chicago Library, were mounted on a distinctive board with a printed caption in English and bore the imprint of Charles Taber.

At the same time, Félix re-opened a studio in Alès, and started the publication of his *opus-magnus*. *Souvenirs d'Orient*, a five-volume compilation of his 250 best photographs was released in 1878. This ambitious work earned him a medal at the 1878 *Exposition universelle* in Paris. Bonfils' commercial ambition manifested itself in the trilingual brief texts accompanying each plate—French, English, and German. *Souvenirs d'Orient*, which also existed in a small size, was conceived as the perfect record for an international clientele travelling on a Grand Tour. In 1880, Bonfils established in Alès a collotype printing factory, where his photographs were printed, some assembled in portfolios. Few examples of this production survived; it probably ceased upon Félix' death on April 9, 1885.

Bonfils, Felix. Colonnes de la salle hypostyle, vue de nord. Karnak, Thebes.
The J. Paul Getty Museum, Los Angeles

Bonfils' varied production raises many issues. The numbers attributed to one specific view changed from one catalogue to another. It is therefore often impossible to give a precise date for Bonfils photographs. Moreover, the same site was sometimes photographed several times, using the same reference number, rendering difficult any attempt at classification. As with many studios of the time, the issues of authorship are very difficult to solve, too. While it is generally admitted that Félix produced the majority of the first campaigns, it is also thought that Lydie herself took several photographs, especially for the costumes series featuring women—Oriental women being more inclined to pose if the operator were a woman herself. Other photographers worked there, according to the short presentation of the c1885 catalogue: "Our employees are constantly traveling in order to renew our negatives in accordance with every latest development in photographic art." Adrien was one of them. Together with his mother, he ran and developed the business after his father died. In 1909, they formed a partnership with Abraham Guiragossian, who eventually bought their archives after Lydie died in 1918. Adrien eventually became a hotel manager.

Bonfils' story epitomizes the venture of many international studios flourishing from the 1860s to the end of the century. Most of them were devoted to views, reproductions of works of art and architecture, and types. They developed in popular sites such as Italy (Sommer, Alinari, or Naya) and the Near East (Sebah, or Zangaki). Often considered as mere commercial photographers by many historians in the field, their production is worthy of interest not only for history of photography, but for art history—artists such as Lawrence Alma-Tadema or Mariano Fortuny collected such photographs, including Bonfils'—and cultural history. Moreover—and this is certainly the case for Bonfils—a significant part of their work appears as more original than the mass-produced clichés aimed at tourist crowds.

Pierre-Lin Renié

See Also: Archaeology; Architecture; Artists' studies; Ethnography; Orientalism; Ottoman Empire, Asian, and Persia; Photographic publishers; Photographic retailing; Women photographers; Niépce de Saint-Victor, Claude Félix Abel; Dumas, Tancrède; Société Française de Photographie; Albumen Prints; Collotype; Sebah, J. Pascal and Joaillier; Sommer, Giorgio; Alinari, Fratelli; and Naya, Carlo.

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BONNARD, PIERRE (1867–1947)

French Painter

Best known for paintings pervaded by brilliant light and radiant color, Pierre Bonnard is less renown for his photographic experiments. It was not until the late 1970s that the artist's photographic oeuvre was recognized at all, and only in the 1980s, was his work in photography given analytical consideration and viewed in relationship to his paintings.

Bonnard's interest in photography seems to have been more the result of historical circumstance than genuine technical curiosity. By the 1880s, when cameras became smaller and lighter and negatives were industrially prepared, photographic equipment became accessible to amateurs. With the creation of the Kodak portable camera, its small negatives, pliable film, and instant photos in 1888, the camera became a necessary accouterment for many artists. It has been speculated that Bonnard's brief foray into photography was spurred not by his desire to employ it as a serious medium but rather by the fact that many of his peers had cameras. Writers Emile Zola, August Strindberg and painters Edgar Degas, Edvard Munch, Franz von Stuck, and Bonnard's close friend Edouard Vuillard all took up the camera and allowed the medium to influence their other artistic and literary experimentations.

Bonnard may have been introduced to the photographic process by Vuillard, who was himself an avid photographer of notable technical accomplishment, even involving his mother in the developing process, but Bonnard was also acquainted with the Lumière brothers, Auguste and Louis, through his musician brother-in-law Claude Terrasse and spent time with them at the family estate at Le Grand-Lemps. These interactions may have influenced Bonnard's own photographic vision as well as the vision he subsequently took from the viewfinder and applied to his canvases.

In contrast to Degas, who approached photography with a preconceived aesthetic end, utilizing the then obsolete glass plate negative, a tripod and dramatically lit interiors in order to study the movement and form of his dancer models, Bonnard was more casual in his photographic work. He neither went to the trouble of learning how to develop or enlarge his work, as did Degas and Vuillard, nor did he require elaborate poses of his subjects. He was also conspicuously silent about this segment of his oeuvre, providing no written insight into his intentions, theories, or techniques. Ultimately, he seemed to regard this work as secondary to his painting and not necessarily an end in itself.

While Bonnard's earliest known photo, an image of his cousin Berthe Schaedlin dates from the early 1890s, he did not begin photographic work in earnest until 1898. It is not clear why a gap exists in Bonnard's photographic productivity. Critics and historians have suggested that he may have been dissatisfied with his earlier attempts in a relatively new medium and kept only those photographs having sentimental value.

It was between 1898 and 1916, when Bonnard's photographic output was at its highest level and

developed thematically and technically in tandem with his experiments in painting and drawing. His subjects were the same as those of his paintings: scenes of domestic interchange, pictures of the his sister's children playing in the pools outside Le Grand-Lemps, and images of the nude and bathing Marthe, Bonnard's model, long-time companion and eventual wife. His most technically adept and visually arresting photographs seem to answer to the same laws he applied to painting. According to his late notebooks of 1939, written long after his abandonment of photography, he noted that nature and observation should be secondary to the harmony and overall tone of a pictorial work. Therefore, it might be said that Bonnard originally sought with his camera not to scientifically record minute details about people or events for replication on canvas, but rather apprehend the flavor of a mood, a personality, or a moment.

Bonnard never directly quoted his photographs when painting. Rather, he employed compositional variations on the frequently domestic subjects evident in his photos. Sometimes he appropriated a silhouette or form that appealed to him. It appears that he viewed his photographs as sketches; both were meant to inspire a mood or capture a fleeting movement for later reference. For Bonnard, who denied any preconceived compositional structure or arrangement in his paintings, the Kodak he carried to family gatherings and the candid shots he captured with it were well suited for his desire to seize and elevate the transitory and happy accidents of the moment. It was in his illustrations for the literary works of his peers that Bonnard seems to have looked directly to, lifted and modified figures from his photographs, particularly those involving Marthe bathing. A photograph dating from 1900-01 and titled *Marthe Standing in the Sunlight* is ostensibly the model for Bonnard's lithograph *Chloe Bathing*, which appeared in Vollard's *Daphnis and Chloe* of 1902. Other overt examples of Bonnard's appropriation of photographed figures for his literary illustrations can be found in Paul Verlaine's *Parallèlement*.

Bonnard's interest in photography began to dissipate in 1905, and he completely abandoned the medium by 1920. Again, his waning enthusiasm for the photographic medium seems to have followed the lead of the same writers and artists who had taken it up in the 1890s. In his last years, particularly those following Marthe's death in January 1942, Bonnard focused all his creative efforts on painting. Dubbed the 'celestial reporter' by artist André Lhote for his ability to imbue the mundane with the sublime, Pierre Bonnard revealed his unique symbolist-inspired vision in photographs by bringing his plastic and painterly approach to a largely mechanical, often unforgivingly literal medium.

Savannah Schroll

Biography

Bonnard was born at Fontenay-aux-Roses, near Paris on 3 October 1867 to the head of a department in the War Ministry and an Alsatian mother. He spent most of his time at the family estate, Le Grand-Lemps, near Côte Saint-André. Between 1886 and 1887, he studied law while also attending the Académie Julian, where he met Paul Sérusier, Maurice Denis, Henri-Gabriel Ibels, and Paul Ranson. A year later, he enrolled at the Ecole des Beaux-Arts, where he encountered Ker-Xavier Roussel and Edouard Vuillard. After a brief period of military service, he rented a studio in Rue Le Chapelais in the Batignolles district and, with Sérusier, organizes the Nabis. In 1889, while still reluctantly pursuing a civil service career, Bonnard submitted a painting that was rejected for the Prix de Rome. He did, however, succeed in selling a poster for "France-Champagne," which led him to embark in earnest on a painting career. He also became involved at this time with the Nabis, a group of artists thus dubbed by the poet Henri Cazalis, lead by Paul Sérusier, took its name from the Hebrew word for 'prophet.' In the early 1890s, Bonnard began experimenting with a portable Kodak camera, then popular with the middle class. He exhibited at the Salon des Indépendents in 1892 and 1893. In 1896, he collaborated with his brother-in-law, the musician Claude Terrasse, and Paul Sérusier to produce sets and music for Alfred Jarry's *Ubu-Roi*. Bonnard also had his first solo show of paintings, posters and lithographs at Durand-Ruel and illustrates Peter Nansen's novel *Marie*. In 1898, Bonnard takes up photography more seriously, carrying his Kodak camera with him to many family gatherings at Le Grand-Lemps. Between 1900 and 1908, he created lithographic illustrations for written works published by Vollard, namely Verlaine's *Parallèlement*, Vollard's *Daphnis and Chloe*, and Octave Mirbeau's *628 E8*. Bonnard participated in the Salon d'Automne in 1913. 1924 sees a large retrospective of his work at Druet's, and in 1925, he married his long time companion Maria Boursin, who called herself Marthe de Méligny and whom Bonnard met in the early 1890s. In 1926 he was appointed to the Carnegie International jury and briefly visited the United States. In 1927 Octave Mirbeau's *Dingo*, containing 55 etchings by Bonnard was published. The following year, he exhibited brightly hued painting at New York's De Hauck Gallery. Kunsthaus Zurich mounted a large exhibition of Bonnard's and Vuillard's works in 1932, and in 1933, forty of his portraits appeared at the Galerie Braun. In 1934, he has an exhibition in New York's Wildenstein Gallery. In 1936 he wins second prize at the Carnegie International. Bonnard died at his villa, Le Bosquet, in Le Cannet, France on 23 January 1947.

See Also: Camera Design: 6 Kodak, (1888–1900); Camera Design: 5 Portable Hand Cameras (1880–1900); and Lumière, Auguste and Louis.

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BOOKS AND MANUALS ABOUT PHOTOGRAPHY: 1840s

The world's first photographic manual was, understandably, a modest affair. Published in April 1839 by Ackermann and Company, *Ackermann's Photogenic Drawing Apparatus* was an eight-page pamphlet offering detailed instructions for using Henry Fox Talbot's pioneering paper negative process. A single copy of the pamphlet —apparently written with Talbot's approval and cooperation—forms part of the Royal Photographic Society's Collection at the National Media Museum in Bradford, England. The introduction refers to the pioneering nature of this publication:

> In offering to the public the following directions for the practice of Photogenic Drawing, which may emphatically be called the *New Art,* we must claim the indulgence of our readers for the necessarily imperfect nature of some of the details; the art itself is but in its infancy, and until the mode in which the drawings were made was liberally disclosed by Mr. Talbot, a Fellow of the Royal Society of London, the whole subject was involved in mystery.

Problems with nomenclature were already evident in that first year of photographic publication, with the English *photogenic drawing* apparently seen as an alternative and interchangeable description of the French *daguerreotype*, despite the two being radically different processes. Thus, amongst the three texts published during 1839 by Louis Jacques Mandé Daguerre, a translation by J. S. Memes (published in London by Smith and Elder), was entitled *The History and Practice of Photogenic Drawing on the True Principles of the Daguerreotype, with the new method of Dioramic Painting*. London publishers W. Strange offered a 46 pp. English translation of *History and Practice of Photogenic Drawing by means of the Daguerreotype with notes and explanations of M. Arago.*

Talbot's own sixteen page treatise, *Some Account of the Art of Photogenic Drawing, or the Process by which Natural Objects may be made to delineate themselves without the aid of the artist's pencil* appeared in the same year, published by R. and J. Taylor. The most substantial of these early publications, was Daguerre's *An Historical and descriptive Account of the Various Processes of the Daguerreotype and the Diorama*, published in London by McLean and Nutt. By the end of the 1840s, despite a rapid growth in photography's popularity, only a further twenty-nine English language manuals and pamphlets were published, although several of these were translations from French and German.

Talbot appears to have been content to let others compile manuals for his photogenic drawing negative process, and two such pamphlets were published in 1840—Alfred Swain Taylor's *On the Art of Photogenic Drawing* (London: Jeffrey, 38 pp) and Nathaniel Whitlock's *Photogenic Drawing Made Easy: A manual of Photography* (London: J. Robins, 16 pp). He did, however, arrange for the publication of his own important paper to the Royal Society in 1841 in which the calotype process was introduced. *The Process of Calotype Photogenic Drawing, Communicated to the Royal Society, June 10th 1841*, a 4 p. pamphlet, was published by J. L. Cox of London.

The first of several seminal texts by Robert Hunt was published in 1841. *A Popular Treatise on the Art of Photography, including Daguerreotype, and All the New Methods of Producing Pictures by the Chemical Agency of Light* was published in Glasgow by Richard Griffin and Company, and at 96 page, was the most comprehensive account of photographic practice published to that date. It ran to several editions, the most important perhaps being the 234 page 1851 volume *Photography: A Popular Treatise on the Chemical Changes Produced by Solar Radiation, and the Production of Pictures from Nature by the Daguerreotype, Calotype, and Other Photographic Processes* published by J. J. Griffin of London. Hunt's 1844 treatise, *Researches on Light: An Examination of All the Phenomena Connected with the Chemical and Molecular Changes Produced by the Influence of the Solar Rays; Embracing All the Known Photographic Processes, and New Discoveries in Art*, published by Longmans, Green and Longmans was, at 303 page, the largest volume on photography published in that first decade.

In addition to Daguerre, Talbot and Hunt, other writers whose works would exert major influence over the practice of the new art also appeared in print during the 1840s. Significant amongst these was the American Henry Hunt Snelling. His volume, *The History and Practice of the Art of Photography; or the Production of Pictures Through the Agency of Light; Containing all the Instructions necessary for the Complete practice of*

the Daguerreian and photogenic Art, both on Metallic Plates and on Paper, was published by G. P. Putnam in New York in 1849, and subsequently ran to several editions throughout the 1850s. It was the first manual to detail the American approach to photography, and to explain the practical differences between European and American methodologies. In this book, Snelling consistently uses the term 'photogenic drawing' as a generic description of photography, differentiating between 'photogenic drawing on paper' and 'photogenic drawing upon metallic plates.' Significantly, for a book so early in the published literature of photography, there are numerous insightful and critical references to the restrictive effects of early patents contained within an historical overview of the art's first decade.

The practical descriptions within the book set a pattern which many later volumes followed—that of summarising the text of other books and journals. Thus chapter two is a resumé of Hunt's *Researches on Light*, and chapter thirteen explains Antoine Claudet**'s** Photographometer, the description being drawn in large measure from an article in the March 1849 issue of the *Art Journal*.

Self or private publishing, was an established feature of the nineteenth century book world, and several amateur photographers published their own descriptions of, and instructions for, the new processes. First amongst there was W. Vaughan Palmer's 1842 book *The Electrotypist's Manual: being a description of the art of working in metal by voltaic electricity, and on electro gilding and plating, 6th edition, improved and enlarged, to which is added a brief description of the Calotype, Daguerreotype, or Photographic Processes.*
Monsieur C. mansion, whose skill with the colourist's brush is evident in many of the fine tinted daguerreotypes by William Kilburn, published his own *Instructions for Colouring Daguerreotypes* in 1845, while Brighton amateur Joseph Ellis published what is believed to be the first reflective and retrospective look at the birth of photography. His booklet *Photography, A Popular Treatise designed to convey correct general information concerning the discoveries of Nièpce, Daguerre, Talbot and others, and a preliminary to acquiring a practical acquaintance with the art* was self-published with apparently limited circulation in 1847, two years before Snelling's *History and Practice of the Art of Photography*.

John Hannavy

See Also: Talbot, William Henry Fox; Photogenic Drawing Negative; Daguerreotype; Daguerre, Louis Jacques Mandé; Calotype and Talbotype; Hunt, Robert; Snelling, Henry Hunt; Claudet, Antoine-François-Jean; Kilburn, and William Edward and Douglas T.

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BOOKS AND MANUALS ABOUT PHOTOGRAPHY: 1850s

It might have been expected during the 1850s, with the introduction of the wet collodion process and the establishment of several significant photographic periodicals, that as the number of people engaged in photography both as amateurs and professionals grew exponentially, the number of manuals on the subject would have increased at an equal rate. The relaxation of patent restrictions increased the number of people taking up photography as a profession, while the introduction of photographic societies and periodicals contributed considerably to the increased popularity of photography as a hobby.

Despite that growth in the potential market for literature on the subject, there was not a significant increase in the scale of photographic book publishing. 1850 saw the publication of only five English language books and manuals, with four in 1851 and only two in 1852. During 1853, however, a total of sixteen such books appeared, with twenty in 1855.

While the number of new books and manuals available to the photographer did not increase significantly in total over the previous decade, the books themselves were generally of a much more substantial nature, as befits a maturing subject.

Robert Hunt set the pattern with his 1851 *A Manual of Photography* published as part of J. J.Griffin's series *Encyclopaedia Metropolitana—or System of Universal Knowledge: on a Methodical Plan Projected by Samuel Taylor Coleridge*. A second edition was published in the following year and periodically expanded and updated. At 34 pages, the 1857 5th edition published by Richard Griffin and Company, was the most comprehensive, and most popular. The London *Art Journal*, in reviewing the title, noted that it "must prove of infinite service to those engaged in the pursuit of this entertaining science."

In the same year in which *A Manual of Photography* first appeared, a 2nd edition of Hunt's *Popular Treatise on Photography*, first published in 1841, appeared under the title of *Photography: A Popular Treatise on the Chemical Changes Produced by Solar Radiation, and the Production of Pictures from nature, by the Daguerreotype, Calotype, and Other Photographic Processes*. The

British edition, at 236 pages was substantially smaller that the more heavily illustrated American edition (294 pp.) published in the following year (New York: S. D. Humphrey). Humphrey, as editor of the American edition, was personally responsible for additional text specifically related to American practice.

If there was a restraining influence on the expansion of the library of photographic literature, it was the high cost of books in the mid nineteenth century. At six shillings, Hunt's *Manual of Photography* cost over half the average weekly income of a skilled artisan, placing it well beyond the reach of all but the affluent. Photography at the time was still the pursuit of those in society with sufficient funds and sufficient leisure time. To underline that exclusivity, membership of the Photographic Society of London cost one guinea— twenty-one shillings per year. Joseph Cundall's 32 page very basic booklet *The Photographic Primer for the use of Beginners in the Collodion Process* (London: Photographic Institution 1854) was available for one shilling, or one shilling and sixpence by post. In advertisements for this book, a selling point was that it contained "A fac-simile (*sic!)* of a Photographic Picture of Birds, showing the difference of Tone produced by various Colours." This was probably the first attempt to explore visually the impact of the collodion plate's blue sensitivity of tone reproduction.

It is a measure of the expanding photographic market that it could sustain so many practical manuals. In addition to Hunt, manuals were written by several other eminent photographers and writers.

Philip Delamotte's *The Practice of Photography: A Manual for Students and Amateurs* (London: Joseph Cundall, 1853) went to three editions—the second published in 1854 and the third in 1855 (London: Sampson Low and Son). An American edition appeared in 1854 (New York: Office of the Photographic and Fine Art Journal). Each edition was embellished with an albumen print from a collodion negative as frontispiece. For the 1855 edition, this was one of Delamotte's own photographs of the interior of the Crystal Palace at Sydenham.

Marcus (William) Sparling, Roger Fenton's assistant during the Crimean War contributed his only publication *Theory and Practice of the Photographic Art* (London: Houlston and Stoneman, 1856), while Robert J. Bingham—who periodically promoted himself as the "inventor of the collodion process"—produced a new edition of his *Photogenic Manipulation* (London: Knight and Sons) in 1854. The first edition had appeared in 1848 and went to eleven editions in total. Worthy of note here is the observation by Charles Heisch in *Photographic Manuals No.1* (London: T and R Willats, 1853) that the first publication of a workable wet collodion process was probably by Gustave le Gray in June 1850 in *A Practical Treatise on Photography Upon paper and Glass* translated by Thomas Cousens and published in English a few weeks later (London: T and R Willats). Heisch himself noted that he had first heard collodion suggested as a possible carrier for the light-sensitive chemistry as early as 1847. The widely acknowledged inventor of a detailed practical collodion process, Frederick Scott Archer—who dismissed both le Gray's and Bingham's claims as nothing more than 'ideas'—produced his own volume, *A Manual of the Collodion Process,* in 1852 (London: self published) and a second edition, retitled *The Collodion Process on Glass* (London: self published), in 1854.

Amongst more specialised books, Sir David Brewster's *The Stereoscope, Its History, Theory and Construction* (London: John Murray, 1856) is significant —the first major publication to deal exclusively with stereoscopy and stereo vision.

The earliest attempt to publish a photographic encyclopaedia was Henry Hunt Snelling's *A Dictionary of the Photographic Art* (New York: H. H. Snelling, 1854) published jointly with Edward Anthony's *Comprehensive and Systematic Catalogue of Photographic Apparatus and Material; Manufactured, Imported and Sold by E. Anthony, 308 Broadway New York* This volume was reprinted in 1979 as part of the Arno Press series *The Sources of Modern Photography*, which series also reprinted Anton Georg Martin's 1854 *Handbuch der gesammten Photographie*, Ernest Lacan's *Esquisses Photographiques* (Paris, 1856) and Claude Marie François Niépce de Saint Victor's 1855 *Recherches Photographiques* (Paris, 1855). Arno's earlier 1973 series *The Literature of Photography* reprinted many of the early manuals and handbooks of photography from the 1850s and 1860s, including A. Bisbee's *History and Practice of the Daguerreotype* (Dayton, Ohio, 1853). While more common that the originals, many of the Arno reprints have themselves acquired significant scarcity in the thirty years since their publication.

JOHN HANNAVY

See Also: Delamotte, Philip Henry; Sparling, Marcus William; Fenton, Roger; Bingham, Robert J.; Le Gray, Gustave; Archer, Frederick Scott; Brewster, Sir David; Snelling, Henry Hunt; and Anthony, EH & T.

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BOOKS AND MANUALS ABOUT PHOTOGRAPHY: 1860s

During the 1860s, with photography having become an established feature of the Victorian world over the preceding two decades, the medium was mature enough to indulge in some reflection. Over seventy textbooks on the subject had already been published before the end of the 1850s, and many of them had perpetuated inaccuracies about the genesis of the medium.

In the 'Prologomena' of the 1934 translation of Victor Fouque's 1867 book *The Truth Concerning The Invention of Photography,* Fouque observed "It is evident, incontestable, that if an error is published, it is soon, without preliminary examination, accepted and adopted as the truth." The error to which he was specifically referring was the widespread contemporary acceptance that Daguerre was the inventor of photography. His purpose was to ensure proper recognition be given to the work of Joseph Nicéphore Niépce.

Three years earlier, in his book *The Silver Sunbeam*, Dr John Towler had also included a brief history of photography as the first chapter of his manual, and had acknowledged the contributions of, amongst others, Wedgwood, Davy and Niépce.

While the majority of the manuals of the 1850s had been concerned with the publication of as many individual variations on current processes as possible —paraphrasing many of the process descriptions which had already appeared in the emerging photographic press—by the end of the decade and the beginning of the 1860s, the structure of new books such as William Lake Price's 1858 *Manual of Photographic Manipulation* (second edition 1868) reflected the maturity of the medium and offered descriptions of a 'standard' set of processes and procedures which individual readers and users could adapt to their own needs.

Alongside such books, later editions of several established 1850s manuals continued the earlier more fragmented approach and, in some cases, simply added new processes, techniques and approaches to descriptions contained in earlier editions. Thus, manuals inevitably got larger. Nathan Burgess's 184 page *Ambrotype Manual*, for example, originally published in 1856, had expanded to 283 pages.—and considerably extended its title—by the time the twelfth edition was published in 1865 as *The Photograph Manual: A Practical Treatise, Containing the Cartes de Visite Process, and the Method of Taking Stereoscopic Pictures, Including the Albumen Process, the Dry Collodion Process, the Tannin Process, the Various Alkaline Toning Baths, etc.*

Thomas Sutton's first British *Dictionary of Photography*—originally published in 1858 four years after Snelling's *Dictionary of the Photographic Art*—was understandably expanded for its second edition in 1867, reflecting an increase in the material which demanded to be included.

Towler's *Silver Sunbeam*, originally published by Joseph H. Ladd in New York in early 1864, quickly became in international best seller. The earlier processes were confined to the historical chapter, giving the later sections of the book a clarity and simplicity which contributed to its success. The initial print run of one thousand copies sold out almost immediately in the United States, and by the end of the first year, was in its 'fourth edition'—although in modern parlance that would simply be described as 'fourth printing,' each of the 'editions' being identical. The first editions were marketed in Britain by John Atkinson of Liverpool and publicised through his extensive catalogue of American photographic products and ephemera, but later editions bore the shared imprint of Ladd and London publisher Tribner & Co.

Later editions—that continued through the 1870s —added new material to the original as appendices, causing the clarity of the first edition to be lost. The ninth edition filled almost twice as many pages as the first. A Spanish language edition *El Rayo Solar*, appeared in 1876, with a second and third in 1884 and 1890 respectively.

Other more specialised manuals also appeared during the 1860s—including Alfred H. Wall's 1861 *A Manual of Artistic Colouring as Applied to Photographs*, and Edward Livingstone Wilson's 1868 treatise *The American Carbon Manual*, the first American textbook devoted exclusively to the carbon process. The first British book on the process was probably George Wharton Simpson's *On the Production of Photographs in Pigments, containing Historical Notes on Carbon Printing and Practical Details of Swan's Patent Carbon Process* published by Piper & Carter in 1867.

Two important books from the Belgian photographer and scientist Desiré van Monckhoven appeared in the 1860s. *A Popular Treatise on Photography*, published in 1863 with an enlarged second edition in 1867, was translated into English by William Thornthwaite, and published by Virtue. His *Photographic Optics* appeared in 1868, under the London imprint of R. Hardwicke.

With the medium having evolved to a level where creative considerations were assuming greater importance, several books appeared dealing with the art of photography, and the relationship of photography with established art forms. Important amongst these, and translated from the original French by Thomas Sutton, was Louis Desiré Blanquart-Evrard's 1864 pamphlet *On the Intervention of Art in Photography.*

Henry Peach Robinson's 1869 book *Pictorial Effects in Photography, Being Hints on Composition and Chiaroscuro for Photographers,* published by Piper &

Carter in London, was probably the most influential of these books, running to four editions by the 1890s. The original edition, however, contained three original photographs, one albumen and two carbon prints.

In addition to broadly-based manuals on photography, a number of books and booklets each devoted to a single process appeared during the decade. Small print runs, and a widening audience for books on photography made such publications both popular and economically viable. C. Russell's 80 page 1861 book *The Tannin Process* proved sufficiently popular to require a second edition by 1863, and Sutton's 1863 book *The Collodion Process, wet and dry* required a second edition within a year. Thomas Piper in London published Joseph Sidebotham's 1866 volume on *The Collodio-Albumen Process* while Sampson Low published Sutton's *A Description of Certain Instantaneous Dry Collodion Processes* in 1864. Intriguingly, with dry processes apparently sweeping all before them as the decade drew to a close, Sutton also published two books in 1869 which included a new wet collodion process.

JOHN HANNAVY

See Also: Sidebotham, Joseph; Robinson, Henry Peach; Blanquart-Evrard, Louis-Désiré; Snelling, Henry Hunt; Sutton, Thomas; Price, William Lake; Towler, John; Niépce, Joseph Nicéphore; Monckhoven, Désiré Charles Emanuel Van; and Daguerre, Louis-Jacques-Mandé.

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BOOKS AND MANUALS ABOUT PHOTOGRAPHY: 1870s

In the chapter 'The Future of Photography,' in Gaston Tissandier's *History and Handbook of Photography*, published in 1875 with a second edition three years later, the author suggested, "The day may perhaps come when the negative will be taken at a distance by means of the electric wire; and if some reader exclaims *Impossible*, I shall refer him to certain telegraphic systems, lately discovered, which allow us to anticipate this new miracle." The book's translator and editor of the English-language edition, John Thomson, offered, as a footnote, the observation, "I believe that there is nothing Utopian in the notion that, ere long, means will be discovered of telegraphing a photograph from one end of the earth to the other."

While Thomson and Tissandier were both very perceptive in their view of the future, the book's historical section is somewhat of a curiosity, perpetuating several misunderstandings and over-simplified accounts of the early years. One surprise inclusion for the 1878 second edition, given the late date, was an essay by William Henry Fox Talbot on the introduction of photogenic drawing and the calotype, and an essay on the photoglyphic process by Talbot's son, the inventor having died the previous year. Two years earlier, Tissandier had published *Les merveilles de la photographie* in Paris.

The 1870s was the decade of transition from homemade wet and dry plate photography, to commercially produced materials. Paper photography had all but disappeared by the mid 1860s and, in Britain, Bolton & Sayce had pioneered emulsion-based plate technology, and companies such as the Liverpool Dry Plate Company, J.T. Chapman in Manchester and others had entered the market. Thus many of the publications produced during the decade in both Europe and America were small books or pamphlets produced by the emerging plate-making industry to promote the effective use of their own products.

Gernsheim in his *Incunabula of British Photographic Literature 1839–1875* lists three such publications in the first two years of the decade—George Dawson's *The Russell Dry Plates* (1871), The Liverpool Dry Plate Company's *Rapid Collodio-Bromide Plates* (1872), Mawson & Swan's *On the Collodio-Bromide Process* (1872)—and these serve as typical exemplars of the material being published in other parts of the world as well. That transition rendered most of the earlier manuals out of date, and signalled the need for both major revisions of earlier texts, and entirely new manuals reflecting the new era of photographic manipulation.

Two books from Dr Hermann Wilhelm Vogel, the discoverer of dye sensitisation and orthochromatic emulsions amongst other things, appeared during the 1870s—his *Handbook of the Practice and Art of Photography* first appeared in German in 1870, with an English-language edition specifically for the American market published in Philadelphia in the following year. The more important volume *The Chemistry of Light and Photography in Their Application to Art, Science and Industry* was published in London in 1875, with subsequent editions into the middle of the 1880s. Vogel was also a prolific contributor of letters and opinion to the photographic press for over a quarter of a century until his death in 1898.

One of the major figures in 19th century physics, chemistry and photographic theory, William de Wiveleslie Abney, privately published the first edition of his book *Instruction in Photography for Use at the School*

of Mining Engineers, Chatham, in 1871, while subsequent editions were commercially published by Piper & Carter in London. The book remained in print, through many editions, into the 20th century, being progressively expanded from 120 pages to 676. The School of Mines evolved into today's Imperial College.

Another volume destined to become a standard text for photographers was Matthew Carey Lea's 1868 *Manual of Photography*, published in Philadelphia by Benerman & Wilson. For the second edition in 1871, the 148 pages of the original had been expanded to 336.

Books and pamphlets on the expanding range of equipment available to the photographer sought to explain the choices available. Amongst them, John Henry Dallmeyer's 12-page *Photographic Lenses: On their choice and Use* was published in 1873, and an expanded 34 page American edition in the following year.

Alphonse Liebert's 1864 book *La Photographie en Amerique* was reissued as a second edition in 1874, two years before his *La photographie au charbon mise à portée de tous* in 1876. The latter title was published in an English language edition as *A Manual of the Carbon Process of Photography* in 1878. Liebert, is also remembered for his 1879 decision to open the first professional portrait studio in Paris equipped with electric lighting.

The ferrotype, or tintype, achieved much greater popularity in the USA than it did elsewhere, so it is not surprising that the first manual devoted exclusively to this humblest of portraiture mediums was published in America. *The Ferrotype and How to Make it* by Edward M Eastabrooke was published in 1872 by Gatchel & Hyatt in Cincinnati, Ohio, and Louisville, Kentucky, and was aimed at amateurs and professionals alike. Uniquely, it was illustrated with two genuine tintypes —both portraits taken by Eastabrooke—one made on the Phenix Plate Co's 'Chocolate Tinted Egg Shell Plate' and the other on 'John Dean & Co's Adamantean Chocolate Tinted Egg Shell Plate,' marketed by the Scovill Manufacturing Company, and E & H T Anthony respectively. Interestingly, in the introduction, the author makes a distinction between the 'ferrotype' and the 'photograph,' lamenting the instability of the latter and lauding the permanence of the former.

The prolific polymath Dr John William Draper published his *Scientific Memoirs* in 1878, his sole book to touch on photography—amongst the many books he wrote on arts, literature and science. Like the Tissandier volume and many others, *Scientific Memoirs* was considered of sufficient importance in the history of photographic books to be republished in 1973 by the Arno Press in New York, as part of their series 'The Literature of Photography.' Also reprinted in the Arno Press series was H. J. Rodgers' 1872 memoir *Twenty Three Years Under a Skylight; or, Life and Experiences of a Photographer*, the first manual specifically dealing with studio portraiture.

Amongst the other specialist books published in the 1870s, J Waterhouse's *Report on the Cartographic Applications of Photography*, believed to have been published in Calcutta in 1870 was, at 240 pages, a detailed description of a relatively limited use of the medium. Lieutenant, later Colonel, Waterhouse was for many years in charge of the photographic unit attached to the Indian Survey Office, later rising to the position of Assistant Surveyor-General in India.

John Hannavy

See Also: Calotype and Talbotype; Talbot, William Henry Fox; and Tintype (Ferrotype, Melainotype).

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BOOKS AND MANUALS ABOUT PHOTOGRAPHY: 1880s

The 1880s saw the continued expansion of publishing in photography, fuelled by increased demand for smaller cameras and the introduction of mass produced gelatine dry plate, which increased the number of practitioners. Publications become more specialized as the field matured and the traditional spheres of endeavor—professional and amateur work, technological development, and scientific research—became more separate.

The work of trained photographic scientists encouraged rapid technological change in the 1880s. Numerous books and periodical articles appear, which established photography as a field of academic study, and furthered research into the scientific basis of the process. Chronicling all the new technical developments was the photochemist Josef Maria Eder, teacher and later Director of the Graphische Lehr- und Versuchsanstalt in Vienna, the first major educational institution devoted to photography. Eder himself was one of the first professional scientists to write about photography. Author of numerous books and treatises Eder wrote on a variety of subjects, including dry plates, oil and gum processes, lenses, instantaneous photography, as well as the theory of photographic process. Most notable is the *Ausführliches Handbuch der Photographie*, a multi-volume textbook, which first appeared in 1882, and continued to be revised and expanded until 1929, eventually

numbering 46 volumes. The volumes of this set offered practical and scientific information on photography and now documented every major advancement of the era. Eder also published *Jahrbuch für Photographie und Reproduktionstechnik* (Halle: Wilhelm Knapp) in 1887, which summarized photographic progress during the previous year.

Dr. Hermann Vogel, another established photo scientist, teacher, author, and editor of the German periodical *Photographische Mitteilungen* (Berlin: Verein der Förderung der Photographie im Berlin, 1864–1911), contributed a survey, *Die Fortschritte der Photographie seit dem Jahre 1879* (Berlin, R. Oppenheim, 1883), translated into English as *Progress of Photography Since 1879* (New York: Wilson, 1883). The book was heralded as very thorough, scientific, well-written, and included chapters on recent developments in emulsion photography and amateur photography. Vogel's research was as wide-ranging as Eder's and his work on dye sensitization led to his taking part in the development of the first orthochromatic dry plate, which allowed photographs to represent colors at the appropriate degree of intensity. His *Die Photographie Farbiger Gegenstände in den Richtigen Tonverhältnissen : Handbuch der Farbenempfindlichen (Isochromatischen oder Orthochromatischen) Verfahren*. (Berlin: R. Oppenheim, 1885), is currently considered the first handbook of orthochromatic photography.

A broader look at progress in the field was contributed by the Englishman William Jerome Harrison, whose *A History of Photography; Written as a Practical Guide and an Introduction to its Latest Developments* (New York, Scovill, 1887) chronicled in detail every development to date. Harrison, very interested in preserving the history of photography in libraries and museums, also compiled what may be the first bibliography of photographic literature, published as a series of articles in 1886 and 1887 in the periodical *Photographic News* (London: Cassell, 1858–1908).

Another prolific author, Léon Vidal, educator, photochemist, and editor of the French journal *Le Moniteur de la Photographie* (Paris: Leiber, 1861–1905), also contributed several key texts. His research in photomechanical processes and permanent printing methods resulted in several books on the subject in the 1880s: *Traité pratique de photoglyptie* (Paris: Gauthier-Villars, 1881), *La Photographie appliquée aux arts de reproduction* (Paris: Gauthier-Villars, 1880) and *Cours de reproductions industrielles* (Paris, Delgrave, 1880). He also revised and updated Alphonse Poitevin's important 1863 book on photomechanical processes: *Traité des impressions photographiques sans sel d'argent* (Paris: Gauthier-Villars, 1883) and wrote two books for the new amateurs: *Manuel du touriste photographe* (Paris: Gauthier-Villars, 1885) and *La photographie des débutants: procédé négatif et positif* (Paris: Gauthier-Villars, 1886).

By 1880 the process of making photographs had reached a point where a scientific background wasn't necessary. Manufactured dry-plates freed photographers from mixing chemicals and coating the plates themselves. Amateurs entered the field in greater numbers and publications came out which catered to their need for straightforward, not-too-technical information on the photographic process. Manuals for these new photographers were numerous, and only a few need be mentioned. Indicative of this new class of amateurs was the title of the book *The New Recreation. Amateur Photography: A Practical Instructor*, by D. J. Tapley. (New York, S. W. Green's son, 1884). The text provided information on taking, developing and printing photographs from dry-plate negatives. Books with the most basic instruction as well as cheaper books came available, such as the 10¢ *How to Make Photographs and Descriptive Price List* (New York: Scovill Manufacturing Company, 1883), which appeared in numerous editions during the 1880s and was basically a short, simple manual attached to a manufacturer's catalog. Appealing to more sophisticated practitioners were manuals like William de Wiveleslie Abney's exhaustive *Photography with Emulsions: A Treatise on the Theory and Practical Working of Gelatine and Emulsion Processes*. (New York, Scovill, 1882), and Paul E. Liesegang's *Die Bromsilber-Gelatine : ihre Bereitung und Anwendung zu photographischen Aufnahmen, zu Abdrücken und zu Vergrösserungen* (Düsseldorf: Ed. Liesegangs Verlag, 1882).

Several new journals marketed only to amateurs appeared for the first time in the 1880s, including the British *Amateur Photographer* (London: Hazell, Watson and Viney, 1884–present), the *American Amateur Photographer* (New York: American Photographic Publishing Company, 1889–1907), and the German *Der Amateur-Photograph* (Düsseldorf: E. Liesegang, 1886?–?). These periodicals were written for the person without a scientific background, who saw photography as a hobby and a pastime. Their tone was upbeat and they offered practical advice through articles and answers to reader's letters, discussed artistic and aesthetic issues, critiqued readers work, sponsored contests and featured articles on subjects appealing to the new amateur such as vacation and family photography.

The first Kodak came on to the market in 1888, starting another revolution in photography. With the camera came *The Kodak Manual* (Rochester, N.Y.: Eastman Dry Plate and Film Co., 1888) containing complete instructions on taking photographs and packing the camera to send back to the factory for development and film reloading. George Eastman wrote the text for the pamphlet *The Kodak Primer* himself, emphasizing the simplicity and ease of the system, writing that the Kodak system

would "furnish anybody and everybody, (man, woman and child,) who has sufficient intelligence to 'Point a small box straight and press a button,' the material that will make a hundred fine negatives."

Several publishers of photographic publications came into prominence, and maintained a virtual monopoly on the field. The majority had ties to the industry, either manufacturing or distributing (or both) photographic goods. The books and periodicals served to furnish information on using equipment to the new amateur, but also served to promote their products through advertisements and editorials. The Anthony company, which began distributing photographic materials in 1840, published *Anthony's Photographic Journal* (1870–1902) as well as books, many appearing in the *Anthony's Series of Photo Publications*, with titles by such luminaries as H.P. Robinson and Josef Maria Eder. Their 1882 booklet, *The Amateur Photographer, or Practical Instructions in the Art of Dry Plate Photography for Young and Old*, provided instruction on every aspect of photography as well as descriptions and prices of Anthony photographic outfits. A rival manufacturing firm, Scovill & Adams, published the important American journal *Photographic Times* (1871–1902) as well as technical books in the *Scovill Photographic Series*, the majority of which were pitched towards the new amateur. The series started in 1881 with the popular book *The Photographic Amateur*, by John Traill Taylor, and included titles other key titles such as Henry Clay Price's *How to Make Pictures or Easy Lessons for the Amateur* (1882 and later editions). The firm also published E.J. Wall's comprehensive *Dictionary of Photography for the Professional and Amateur Photographer* (New York: Scovill & Adams, 1889) which appeared for over fifty years in 17 editions.

Bennerman and Wilson was another venerable name. Edward Livingston Wilson was a prominent figure amongst photographers, a publisher of photographic books, editor of the important American journal for professional photographers, *Philadelphia Photographer* (later *Wilson's Photographic Magazine*), and distributor and manufacturer of equipment and supplies. Acting as journalist for the profession, Wilson's editorials chronicled important events and technical advances. He had some technical experience, and also authored several books, including two important textbooks. *Wilson's Photographics: A Series of Lessons, Accompanied by Notes, On all the Processes Which are Needful in the Art of Photography*. (New York: E.L. Wilson, 1881), comprised a series of lessons touching on art and technical matters, theory, and history. *Wilson's Quarter Century in Photography. A Collection of Hints on Practical Photography Which Form a Complete Text-book of the Art* (New York: E.L. Wilson, 1887), equally as comprehensive, included supplementary information gleaned from the pages of the *Philadelphia Photographer*.

In France the house of Gauthier-Villars, publisher of scientific books, catered to both professional, scientist and amateur. They offered photographers an enormous number of books, including translations of important German and English texts. They also published the 4 volume *Traité Encyclopédique de Photographie* by Charles Fabre (Paris: Gauthier-Villars, 1889) an important milestone in publishing as each aspect of photography discussed included historical information on preceding developments.

The 1880s saw an awakening of debates on art photography with amateur photographers at the center with two British photographers dominating the discussion. In 1889 P.H. Emerson's *Naturalistic Photography for Students of the Art*, a theory of art photography with technical instructions (London: S. Low, Marston, Searle & Rivington) was published, essentially a rebuttal to H.P. Robinson's 1869 *Pictorial Effect in Photography* which had been republished in an inexpensive edition in 1882 and was widely considered *the* book on artistic matters. Robinson, author of several other books and many articles in the 1880s (*Art and Practice of Silver Printing*, *Picture Making by Photography*, *The Studio and What to do in It*), had been a spokesperson for art photography since the late 1860s and P.H. Emerson's book ushered in a decade of lively debate over the merits of Emerson's versus Robinson's style of photography and the basic question of the place of aesthetic matters in photography.

A few projects of the decade warrant noting as they had associated publications which documented these activities. Edward Muybridge's initial attempts at photographing running horses, his experiments underwritten by Leland Stanford, were first reproduced as line drawings in Jacob Davis Babcock Stillman's *The Horse in Motion* (Boston: J. R. Osgood, 1881). In a milestone project of the era, photography was used to document an important celestial event. Photographers were stationed in the U.S. and around the world to photograph the transit of Venus. Data from the photographs would allow scientists to determine the distance of the sun from the earth. A booklet of exact instructions to be used by the photographers was printed for the event, *Instructions for Observing the Transit of Venus, December 6, 1882* (Washington, D.C.: Government Printing Office, 1882).

Becky Simmons

See Also: Dry Plate Negatives: Gelatine; Vidal, Léon; Poitevin, Alphonse Louis; Camera Design: 6 Kodak, (1888–1900); Eastman, George; Eder, Joseph Maria; Scovill & Adams; and Emerson, Peter Henry.

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BOOKS AND MANUALS ABOUT PHOTOGRAPHY: 1890s

The most important development to affect photographic publications in the 1890s was an intensification of discussion and debate around photography as art. Amateur associations and groups had grown tremendously during the 1880s, as technological changes opened photography to more practitioners. In the 1890s, new groups focused on one issue—the aesthetic potential of photography—were established in major European cities. One of the first of these groups, the Photo Club de Paris had been established in 1888, specifically separating their goals and ambitions from those of amateur clubs already in existence. Another milestone, and symptomatic of the shift, was the *International Ausstellung Kunstlerische Photographie* organized by the Club der Amateur Photographen in Vienna in 1891, the first international exhibition limited to just artistic photography. Shortly afterwards the Brotherhood of the Linked Ring, an international group of photographers protesting the lax standards of the Photographic Society of Great Britain exhibitions, formed in England. Eventually major cities in England, France, Germany, Belgium, Austria and the United States had its own photography group that aspired to elevate the creative potential of photography. An international artistic photography movement with ties to avant-garde art and literary groups took off in the 1890s, and this activity generated numerous publications, including the record of exhibitions, manuals on new processes and aesthetic trends, and new periodical titles devoted to artistic photography.

Chief among these publications were salon catalogs, many illustrated with finely printed photogravures on special papers. The 1894 *Première Exposition d'Art Photographique* of the Photo-Club de Paris had an substantial accompanying catalogue that contained 56 photogravure plates and an introduction by Armand Dayot, Inspecteur des Beaux-Arts that extolled photography's potential as an art form and compared the spirit of the works to paintings. *Nach der Natur: Photogravüren nach Originalaufnahmen von amateurphotographen* (Berlin, 1896), the catalog of a competition sponsored by the Berlin Photographische Gesellschaft also featured fine reproductions. The Association Belge de Photographie began focusing on art photography in the 1890s, publishing albums of prints conjunction with their special exhibitions. A juried exhibition took place at the Pennsylvania Academy of the Fine Arts in 1898, and the *Catalogue of the Philadelphia Photographic Salon* commemorates the event which is considered the first exclusively fine art photography exhibition in the United States. Even Eastman Kodak Company found reason to associate with the movement and published *Kodak Portfolio: A Souvenir of the Eastman Photographic Exhibition 1897: A Collection of Kodak Film Pictures by Eminent Photographers* (London: Eastman Photographic Materials Co., 1897), which contains original photogravures from negatives on Kodak film by J. Craig Annan, H. P. Robinson, Francis Benjamin Johnston and other well known photographers. This explosion of publishing extended to clubs outside the large metropolitan centers as well, and their annual exhibitions usually have at the very least some sort of modest check-list of participants and their works.

Many associations and clubs published journals, which provided the usual mix of news of people and events, articles on technical matters, and print critiques. Many also included beautifully printed reproductions, often in photogravure, of the newest work. The finest of these illustrated publications included *Die Kunst in der Photograhie* (Berlin: Verlag von Julius Becker, 1897–1908) edited by Franz Goerke; *L'Art Photographique* (Paris: Georges Carré et Naud, 1899–1900); *Wiener Photographische Blatter* (1894–1898), organ of the Wiener Camera Club; and *Photographische Rundschau* (Halle: Wilhelm Knapp, 1887-–1903) representing both Austrian and German interests, which expanded coverage to include aesthetic issues. From Belgium came *Sentiment d'art en photographie* (Bruxelles: Xavier Havermans, 1893–?), featuring work chosen from a monthly contest. In the United States, the Camera Club of New York began publishing *Camera Notes* (New York: Camera Club, 1897–1903), edited by a committee headed by Alfred Stieglitz, the most influential figure in the art photography movement in the United States. Another American title, *Photo-Era* (Boston, 1898–1932), edited by Juan C. Abel, tried to educate Americans about artistic matters with exhibition reviews, print critiques and high-quality reproductions. Not quite as luxurious, but supplying important information and articles on relevant issues to art photographers were *Bulletin du Photo-Club de Paris* (Paris: The Club, 1892–1902), the British *Photogram* (London: Dawbarn and Ward, 1894–

1920) and *Photograms of the Year* (London: Dawbarn and Ward, 1895–1960) as well as *Amateur Photographer* (London: Hazell, Watson & Viney, 1884–1908). Journals which were long established also took up the cause, and the pages of the *Bulletin de L'Association Belge de Photographie* (Bruxelles, L'Association, 1874–1930) can be consulted as well as *Photographische Correspondenz*, organ of the Club der Amateur-Photographen in Vienna. *Wilson's Photographic Journal* (1864–1914), edited by Edward Wilson, an American editor and entrepreneur very interested in artistic photography, brought news of developments in Europe to professional and amateur photographers in the United States.

Signaling another new development, The *Photogram* (London: Dawbarn & Ward, 1894-1920), began publishing a supplement on "process work," reporting on new products and trends in photomechanical reproduction, which had become popular among photographers as well as a growing industry in this period. In 1896, it grew to several pages and had its own title, *Process Photogram* (1894–?). Two more titles on the subject appeared at the same time, *Process Work* (London: Percy, Lund, 1894–1920), and *Process Work Year Book*, (London: 1894–1982), which was published into the 1980s as *Penrose Annual.*

Manuals appeared which emphasized aesthetic over technical matters, dealing with such subjects as schemes for lighting portraits, marine or mountain photography, and choice of subject. They were generally written by leaders of the movement and include *Amateur Photographer* editor A. Horsley Hinton's *Art photographique dans le paysage: étude et pratique* (Paris: Gauthier-Villars, 1894) and *Practical Pictorial Photography*; H.P. Robinson's *Art Photography In Short Chapters* (London: Hazell, Watson, & Viney, 1890) and *The Elements of A Pictorial Photograph.* (Bradford, England: Lund, 1896); Photo Club de Paris founder Emile Puyo's *Notes sur la Photographie Artistique*, and W. I. Lincoln Adam's *Sunlight and Shadow: A Book for Photographers, Amateur and Professional* (New York: Baker and Taylor, 1898).

The decade saw creative experimentation with various print-making processes, both silver and non-silver, and technical advances led to new interest in and appreciation of photo-mechanical processes (in particular photogravure) as photographers tried to stretch the accepted boundaries of the conventional photographic print. Gum-bichromate was extensively used, as photographers could incorporate color or manipulate the process to painterly ends, and manuals and technical treatises appear to support this new interest, including Alfred Maskell and Robert Demachy's *Photo-aquatint, or, The Gum-Bichromate Process: A Practical Treatise on a New Process of Printing in Pigment Especially Suitable for Pictorial Workers* (London : Hazell, Watson, & Viney, 1897). A platinum based printing process called platinotype became very popular for its velvety blacks and long tonal range, leading to several new books including A. Horsley Hinton's *Platinotype Printing: A Simple Book On The Process.* (London : Hazell, Watson, & Viney, 1897) and William de Wivesleslie Abney and Lyonel Clark's *Platinotype, Its Preparation and Manipulation* (London : Sampson Low, Marston, 1895).

The Emerson-Robinson debate over photographic aesthetics, which reached its heighth in 1889 with P.H. Emerson's *Naturalistic Photography for Students of the Art*, continued, but the personal hostilities came to a startling finish in 1891. In that year Emerson published an article/pamphlet titled *Death of Naturalistic Photography*, where he rebuts his own theory and proclaims that photography cannot be an art. This was by no means the end of the debate, it was continued in the journals, and was an important focus of the period. Emerson continued to publish as well, issuing a third edition of *Naturalistic Photography* that included *Death of Naturalistic Photography* in 1899.

The publication of books and periodicals on specific applications for photography continues unabated as scientists, artists, archaeologists, and others employ photography in their work. Of special note is Alphonse Bertillon's *Photographie judicaire avec un appendice sur la classification et l'identification anthropométriques,* (Paris, Gauthier-Villars et fils, 1890), essentially a police manual on photographing criminals. Applications were varied: the discovery of x-rays by Roentgen in 1895 led to several new books on the subject; Etienne-Jules Marey used photography to analyze human and animal motion, resulting in several important publications; and the new popularity of bicycles and photography for leisure activities can be seen in their pairing in the journal *Cycle and Camera* ([London] : Jefferson and Welford, 1897–) and several manuals on these subject. And finally, on the lightest of notes, Walter Woodbury published *Photographic Amusements* (New York: Scovill & Adams, 1896) containing directions for manipulating and making new kinds of photographs using ordinary household materials. The popularity of this book continued through 11 editions in 41 years.

Photography was a part of modern culture and civilization by the 1890s and generally accepted as a pastime, a profession and a tool. Photographic technology fueled modernization as photography was applied to every kind of scientific endeavor, aided medical research, revolutionized publishing, and continued to contribute a visual component to research in less technical enterprises, from archeology to art. Books on photography for all these areas of endeavor continues at a prodigious rate, really a harbinger the explosion of publishing in the twentieth century.

BECKY SIMMONS

See Also: Robinson, Henry Peach; and Annan, James Craig.

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BOOKS ILLUSTRATED WITH PHOTOGRAPHS: 1840s

In October 1844, William Henry Fox Talbot and Nikolas Henneman, travelled to Scotland to undertake a project which would have an enduring effect on the future direction of photography. With support from Lady Elizabeth Fielding, Talbot had determined to publish a photographically illustrated book, *Sun Pictures in Scotland*, which would draw its inspiration from the life and works of Sir Walter Scott who had died twelve years earlier.

In publishing this volume, he not only gave the world its first themed photographically illustrated book, but also provided the inspiration for a publishing direction which endures and grows to this day—the travel book. It can be argued, however, that is not a book, but a portfolio, as it has no text, simply picture captions.

Sun Pictures in Scotland was published in an edition of one thousand copies, all subscribed for in advance, and required the production of twenty three thousand hand made salted paper prints from calotype negatives. Each print was pasted in by hand.

While the book can undoubtedly be recognised as the first photographically illustrated book published in a significant edition, it was not the first photographically illustrated publication.

There remains some debate over what constitutes a publication, and what distinguishes a book from an album. Claims have been made for L.L. Boscawen Ibbotson's *Le Premier Livre Imprimé par le Soleil* from 1839 to be accepted as the first photographically illustrated publication, but this was no more than an album of contact prints of grasses, flowers and ferns, circulated in a small edition. It was exhibited at the 1851 Great Exhibition at the Crystal Palace in London as being 'the first book published by the sun'.

Hill and Adamson's *A Series of calotype Views of St Andrews, Published by D.O. Hill and R. Adamson at their Calotype Studio, Calton Stairs, Edinburgh* in 1844 also falls into this category.

Similarly, Anna Aktins' meticulous volumes of contact prints of flowers, algae and ferns, illustrations and texts printed by the cyanotype process, cannot be seen as 'books' in the modern sense of commercial publications.

The case for identifying the privately published *Record of the Death-Bed of C. M. W.* privately (printed in January 1844 with a text by John Walker Jnr, and illustrated by a calotype by Nikolas Henneman of a bust of the deceased) as the first photographically illustrated publication, is problematic. It conforms to the modern conventions of publication—printed text accompanied by a photograph—but was not published in any real sense.

Photography's first illustrated publication was Talbot's *The Pencil of Nature*, published in six parts between 29th June 1844 and 23rd April 1846. It was also the world's first partwork.

Also in 1846, the German publisher Hermann Johann Kessler produced *Gedenblätter an Goethe*, the first photographically illustrated book outside the United Kingdom.

Perhaps more significantly in terms of scale and impact, the journal *The Art Union* illustrated its June 1846 issue with a salt print from one of Talbot's calotype negative. Seven thousand copies were produced, making it the largest photographically illustrated edition of the decade.

Talbot went on to produce sixty six calotype illustrations for a fourth volume to augment William Stirling's three-volume *Annals of the Artists of Spain* in 1848.

John Hannavy

See Also: Talbot, William Henry Fox; Henneman, Nikolas; Calotype and Talbotype; and Hill, David Octavius and Robert Adamson.

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BOOKS ILLUSTRATED WITH PHOTOGRAPHS: 1850s

As with the 1840s, many of the photographically illustrated publications of the 1850s were little more than portfolios of captioned photographs. In that era, publishers do not seem to have made the clear distinction that would be made today. As most were made available in significant and sometimes substantial editions, and were advertised and sold to the public, they were accepted as publications, and publishers did not differentiate between those with texts and those with captions. Thus the majority of publications by Joseph Cundall's London publishing house are seen today as albums. Titles included *The Photographic Album* edited by David Bogue and published each year from 1852 to 1854, containing albumen prints by Roger Fenton, Philip Delamotte, Hugh Owen, Alfred Rosling and others. He also published James Robertson's *Photographic Views of Constantinople* (1853) and *Photographic Views of the Antiquities of Athens, Corinth, Aegina etc* (1854). London publisher Charles Whittingham published a similar volume from the members of the Photographic Club in 1857, featuring the same photographers together with Francis Bedford, Hugh Diamond, Robert Howlett, John Dillwyn Llewellyn, William Lake Price and others.

A considerable number of books containing a single tipped-in photograph were also published—perhaps more to promote sales rather than using photography to expand and develop the ideas within the text. Amongst these, and also published by Cundall, was Philip Delamotte's textbook *The Practice of Photography: A Manual for Students and Amateurs*. Each of the three editions, published in 1853, 1854 and 1855, had a different albumen print tipped in as a frontispiece. David Frederick Markham's *A History of the Markham Family* (London: J. B. Nichols, 1854) had a single photographic copy of a painting as a frontispiece, while John Collis Warren's *Remarks on Some Fossil Impressions in the Sandstone Rocks of the Connecticut River* (Boston: Ticknor and Fields, 1854) included a salt print. Hugh Miller's *The Testimony of the Rocks, or Geology and its bearings on the Two Theologies, Natural and Revealed* (Edinburgh: Shepherd and Elliot, 1857) included a portrait of Miller himself by J. G. Tunny, the Edinburgh portrait photographer.

Amongst those books to make significant use of photography, were Hugh Owen's and Claude-Marie's. Ferrier's illustrations (printed in France) for the *Great Exhibition of the Works of Industry of All Nations. Reports of the Juries on the Subjects in the 20 Classes into which the Exhibition was Divided* (London: Spicer Brothers, 1853) ranks as one of the earliest. Within the four volumes, of which an edition of one hundred and fifteen copies was prepared, one hundred and fifty five photographic illustrations were used. Owen used post-waxed calotype negatives, while Ferrier took his photographs on albumenised glass plates. Of the edition, fifteen copies were reportedly given to William Henry Fox Talbot in return for his permission to proceed with the project, as he had patented the idea of publishing photographically illustrated books.

Photographic dealers Harvey and Reynolds of Leeds published their *Catalogue of Photographic Apparatus illustrated by Photographs of Such* in 1855, the earliest recorded use of photography in a sales catalogue, but few details of it survive.

Roger Fenton's photographs of the Codex Alexandrinus in the British Museum were used in *Photographic Facsimiles of the Epistles of St. Clement of Rome, made from the unique copy preserved in the Codex Alexandrinus* with a foreword by Sir F. Madden (London: British Museum, 1856), the earliest recorded photographically illustrated museum publication. Sir John Charles Robinson's *Catalogue of the Soulage Collection, Being a descriptive Inventory of a Collection of Works of Art, formerly in the possession of M. Jules Soulages of Toulouse, now exhibited to the public at the Museum of Ornamental Art, Marlborough House, December 1856* (London: Chapman and Hall/Marlborough House, 1856) is the earliest known photographically illustrated exhibition catalogue in the English language. Ten tipped in albumen prints were included. Three years later P. & D. Colnaghi in London, and Thomas Agnew in Manchester published the five-volume *Photographs of the Gems of the Art Treasures Exhibition, 1857, Ancient and Modern Series* with fifty illustrations in each volume by Caldesi and Montecchi, and Robert Howlett, later combined into two volumes with a total of two hundred photographic illustrations. No text was included, but each photograph was captioned.

During the decade, however, the emergence of the true photographically illustrated book can be chronicled alongside a growing number of published albums and portfolios of photographs.

Rivers, Mountains and Sea-coast of Yorkshire with essays on the climate, scenery, and ancient inhabitants of the county by John Philips (Oxford: probably self-published, 1854) may well be the first book in which tipped in photographic prints were offered as an alternative to the more conventional engraved illustrations. The ordinary edition was illustrated by thirty-six engrav-

ings, while in a deluxe edition these were replaced by the same number of albumen prints, from photographs taken by the author. He was, at the time, Keeper of the Ashmolean Museum in Oxford, and author of several books on geology.

Francis Frith's partwork *Egypt and Palestine photographed and described by Francis Frith* was originally published in portfolio form (London: James Virtue, 1858) but in 1859 was republished as two books, with a third volume published in the following year. The extensive text in both the partwork and the books offers a definitive and first-hand account of Frith's travels to Egypt and the Holy Land in 1857.

1858 also saw the publication of *Stereoscopic Views in North Wales photographed by Roger Fenton* (London: Lovell Reeve)—containing twenty-one stereoscopic views and an accompanying descriptive text—one of several collaborations between Fenton and Reeve which continued into the 1860s. 1858 also saw the publication by Reeve of Charles Piazzi Smyth's *Teneriffe, an Astronomer's Experiment* at 452 pp. with twenty stereographs, and *Narrative of a Walking Tour in Brittany* with text by Reeve and John Jephson, containing a stereo frontispiece and accompanied by a boxed set of ninety stereocards. Reeve's periodical *The Stereoscopic Magazine* was already well established, offering three stereo views and accompanying text per issue.

Seven illustrated books containing photographs of India by Captain Linnaeus Tripe appeared in the same year, published by the Madras Presidency.

Little more than a hundred English language publications appeared between 1850 and 1859. As the 1850s drew to a close, and the price of albumen prints reduced, the number of photographically illustrated books as we would recognise them today started to increase. That number was increased considerably during the following decade.

JOHN HANNAVY

See Also: Fenton, Roger; Delamotte, Philip; Owen, Hugh; Rosling, Alfred; Robertson, James; Bedford, Francis; Diamond, Hugh Welch; Howlett, Robert; Llewellyn, John Dillwyn; Price, William Lake; Leon, Moyse & Levy, Issac, Ferrier, Claude-Marie, and Charles Soulier; Henneman, Nikolaas; Talbot, William Henry Fox; Colnaghi, Paul and Dominic; Agnew. Thomas; Caldesi and Montecchi; Frith, Francis; Reeve, Lovell Augustus; Smyth, Charles Piazzi; and Tripe, Linnaeus

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BOOKS ILLUSTRATED WITH PHOTOGRAPHS: 1860s

The 1860s is considered as a 'Golden Age' in printmaking—particularly in Great Britain—and a plethora of reprographic processes were available. In 1859 William John Stannard listed no less than 156 in his privately published *Art Exemplar*. Photographically illustrated publications formed part of this great expansion in illustration during this decade.

Technological and economic aspects were influential in the rise during the 1860s of books and other publications illustrated by photographic processes. The 1860s saw an economic boom period and commercial photography benefited accordingly. Books became cheaper to manufacture through both new printing technologies and the economies of scale enabled by the increasing disposable income of the burgeoning middle class. A transition took place whereby photographically illustrated books moved from being the domain of the very rich to a wider and more diverse audience.

As a result of these conditions, it is likely that ten times the number of photographically illustrated titles were published during the 1860s than had during the 1850s. However, the scale, scope and significance of the 19th century application of photography to the illustration of books and other publications containing printed text largely awaits discovery and interpretation. Nevertheless, it is clear that the publishers of Great Britain, Germany and France were the leaders in producing books illustrated by photography.

The physical form of photographic illustration developed in the 1850s was continued in the following decade. Photographic prints were pasted onto one side of separate sheets of paper of heavier stock than the text pages, and these were inserted amongst the signatures. Frequently these folios were unpaginated though they might include letterpress captions and credits. There are few examples of photographically illustrated books in which photographs had been pasted into specifically created blank spaces on text pages, thus pointing to full integration of photographic image and text. One such title was William and Mary Howitt's *Ruined Abbeys and*

Castles of Great Britain published in 1862. However, this format remained uncommon.

Photographic publishers adopted a number of standard publishing marketing strategies. One was the use of pre-publication subscription, particularly for deluxe titles. The part work or serial was another hallmark of photographically illustrated publications. Frequently, once a full year of a serial had been published the parts were given a special title page, bound as individual volumes—often available in a variety of different bindings and sold to the Christmas market. These approaches were a mixture of the practical issues and challenges inherent in the nascent mass production techniques, marketing strategies to attract a wide range of buyers and attempts to limit financial liabilities. Thus prices of photographically illustrated books could range from a couple of shillings to several guineas. Nevertheless, from the 1860s advertisements in periodicals chronicle the path of unsold stock, via price reductions, remaindering and specialist auction houses offering the entire remaining stock of photographically illustrated books that had failed to sell.

Photographic publishers exploited the 19th century fascination for celebrity and biography. A total of some 125 portraits by A.A.E. Disdéri were published in Paris between 1860 and 1863 under the title *Galerie des Contemporains*. Some 144 portrait photographs by Ernest Edwards were co-published in London by Lovell Reeve and A.W. Bennett between 1863 and 1867 under the title *Portraits of Men of Eminence in Literature, Science and Art*. Other portraits by Edwards were published between 1865 and 1868 by Churchill in London as *Photographs of Eminent Medical Men of all countries*. The work of another leading portrait photographer—John Jabez Edwin Mayall—was published between 1867 and 1868 as *Mayall's celebrities of the London Stage, a series of photographic portraits in character*.

The photographically illustrated publications on works of fine and decorative art and architecture proliferated during the 1860s. The reproduction of engravings after paintings was common, though by the end of the 1860s photographic art publishers such as Adolphe Braun of Dornach began to photograph directly from paintings. Braun's Carbon prints of the frescoes of the Sistine Chapel published in 1869 form one of the landmarks in the influence of photography to change art historical scholarship.

In Great Britain photographic publishers included Samson Low, Bell & Daldy, A.W. Bennett, Day & Son, Seeley, Jackson & Halliday and Bickers & Son. Specialist art societies, such as the Arundel Society, also played a key role and in the late 1860s and early 1870s this society collaborated with the South Kensington Museum and the Department of Science and Art in a series of photographic publications titled *Art Workmanship of Various Ages and Countries*.

The 1860s also saw the limited introduction of a number of permanent photographic and photomechanical processes that were applied to book illustration. The Carbon print and the Woodburytype are particular examples. An advantage of the Carbon process was that the pigments that formed the photographic image could be tinted as a single colour. The Autotype Company, founded in Brixton in south London in 1868, became a key promoter of the Carbon process both as a printer and publisher of photographically illustrated books.

Photozincography was exploited by the Ordnance Survey Office in Southampton to reproduce the Domesday Book and other historic manuscripts. Photolithography began to be used to reproduce graphic art and line drawings in a variety of publications, including books, serials and periodicals.

Early examples of photogravure began to appear in the late 1860s such as Eduard Baldus' *Palais du Louvre et des Tuileries* that commenced publication in 1869.

By the later part of the 1860s photographic illustration had already encompassed a very wide range of human activity from medical treatises to local history. It ranged from cheap consumer titles, through de luxe volumes for the rich collector to the periodicals of scholarly societies, though this latter area was not large-scale.

ANTHONY HAMBER

See Also: *Galerie Contemporaine (1876–1884);* and Braun, Adolphe.

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BOOKS ILLUSTRATED WITH PHOTOGRAPHS: 1870s

The 'golden age' of photographically illustrated publications of the 1860s was consolidated during the 1870s. The number of photographically illustrated publications continued to rise, and compared to the 1860s probably by a factor of more than three times. However, the commercial success of photographically illustrated publications during the 1870s, and how this market was affected by the serious economic recession in the middle of the decade, has yet to be fully evaluated.

The 1860s had seen a very rapid rise in photographically illustrated publications and the scope of application was largely defined. In physical terms the vast majority of photographic illustrated publications of the 1870s continued to be in the form of pasted in Albumen prints. However, during this decade a wider range of photographic print processes was exploited for a variety of objectives. These included the Carbon transfer process, and a variety of photomechanical processes ranging from the Woodburytype through the Collotype to photolithography.

Sales and marketing strategies of photographic publishers varied during the 1870s. Some publishers aimed at the luxury end of the market and exploited the characteristics of the Woodburytype. Other publishers built on the industrialised production of the Albumen print, while others aimed to exploit photomechanical processes to improve productivity, cut costs and thus target a wider audience. The part work continued to be a staple.

The photographically illustrated art serial reproducing well-know paintings were popular during the 1870s. In 1875 the contemporary press reported that the 'artisan classes' of the principal manufacturing towns in the north of England flocked to obtain an issue of *The Picture Gallery* (published by Sampson Low, Marston, Low, and Searle of London) dedicated to the artist Sir Joshua Reynolds (1723–1792). Curiously, the photographic illustrations were in fact almost exclusively taken from engravings after the paintings.

The Carbon transfer process produced a permanent photographic print, which coupled to a broader tonal range differentiated it from the ubiquitous Albumen print. Since different coloured carbon 'tissue' could be used, the Carbon process was particularly well suited to reproducing artists' drawings created in a single colour. B.B. Woodward's *Specimens of the Drawings of Ten Masters, from the Royal Collection at Windsor Castle* published in London in 1870 contained a variety of different coloured and achromatic Carbon prints printed by Edwards & Kidd. However, a wide range of subject areas were covered by the Carbon print including medical treatises such as *On Tracheotomy, Especially in Relation to Diseases of the Larynx and Trachea* published in Philadelphia in 1876.

The Woodburytype, characterised by its rich, dark shadow detail, was patented in 1864 and rose to prominence during the 1870s. Though the prints were photomechanical, they were time consuming to print and then needed to be trimmed and individually mounted. This degree of labour intensity was to eventually lead to the processes demise. One of the most notable Woodburytype publications was *Galerie contemporaine* published in Paris between 1876 and 1884. The large sized portraits of eminent French men—almost exclusively from life—were printed by Goupil et cie, one of the pre-eminent photographic publishers.

The Collotype, patented in 1869, came of age during the 1870s, though the principles behind the process dated back to the mid 1850s. It differed from the Woodburytype since the image could be printed directly onto the paper support. However, as with the Woodburytype, the Collotype could not print both image and text together. The rotary Collotype was announced by the photographer and printer Joseph Albert (1825–1886) of Munich in 1873 and in the following year he made the first colour Collotype. The art critic John Ruskin (1819–1900) was an earlier adopter of the Collotype using the process to illustrate his *Aratra Pentelici. Six Lectures on the Elements of Sculpture* published in 1872. John Thomson's *Illustrations of China and its people* was published in London between 1873–1874 and its 218 illustrations were Collotypes.

In the UK two companies were prominent in their exploitation of Collotype for book illustration; The Autotype Company was the first firm to produce and market Collotypes through the brand 'Autotype' covered a variety of photographic print processes. The Heliotype Company, whose printing works was run by Ernest Edward (1837–1903), was also prominent. In 1872 Edwards moved to Boston to become manager of the Heliotype Corp., part of the James R. Osgood Co. that published a range of photographically illustrated books using the Collotype process.

Photolithography had based its commercial market on the reproduction of line drawing. During the 1870s the process was increasingly used to reproduce drawings that appeared as illustrations in architectural periodicals such as *Building News*. The London trade directories of the 1870s indicate that the number of photolithographers had more than quadrupled in this decade. James Akerman was one of the leading exponents. William Griggs (1832–1911) continued his pioneering photolithographic work. Perhaps the most important work photolithographed at his works in Peckham, south London was the reproduction of Pantanjali's *Mahabhashya*—one of the great Sanskrit grammars written in the 2nd century BC—from originals borrowed from Bombay. These were published in 1874 at a cost £6000 less than an estimate put forward by a firm who proposed to copy the manuscript by hand. Griggs, a pioneer of colour photolithography, also created many photolithographic illustrations for the influential periodical *Indian Antiquary* that commenced publication in 1872.

There were sporadic uses of photogravure during the 1870s. It was the introduction of the practical and commercially viable process of Karl Klič (1841–1926) in 1879 that spawned a new chapter in the history of books illustrated by photography.

ANTHONY HAMBER

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BOOKS ILLUSTRATED WITH PHOTOGRAPHS: 1890s

By the 1890s, book illustration had evolved from the old methods of using original photographs in books to include photo-mechanically reproduced illustrations. Many photographers continued to make valued and rarified objects containing tipped-in photographs while others looking for a wider audience relied on a variety of photomechanical reproduction processes.

The book topics benefiting most from the addition of photo illustration included scientific and ethnographic studies, promotional pieces for tourism or relocation, and children's stories and nursery rhymes. At turn of the century photographically illustrated books coincided with the first period of consistent development of art photography. Not withstanding photographers responded in a number of directions to imaginative and factual writing when coupling their images to the text.

Preserving memories and a nostalgic look at gentler times in the face of industrialization is what appears to have motivated many authors. When Naturalist photographer Peter Henry Emerson published *Wild Life on a Tidal Water* (1890) his images of Britain's East Anglia captured the disappearing rural lifestyle yet were reproduced in the new halftone printing process.

Perhaps inspired by an equivocal need for flight of the imagination, other photographers illustrated books about travel and people of the world. William Shepard Walsh produced *Around the World in Eighty* Minutes (1894) showing some of the most interesting monuments and beautiful scenes on the earth's surface. Books expressing to preserve family memories and mirror society's desire for more leisure time are enunciated in E. A. Allen's *A Jolly Trip: Or, where we went and what we saw last summer* (circa 1895), Frank G. Carpenter, *Travels Through North America with the Children* (1898), and Mary Abigail Fowler's *Snap Shots with Tales of Travel Truthfully Told* (1898) Lida Brooks Miller features a number of halftone reproductions of scenes taken in Africa, Europe American and Asia in *Round the World with Notebook and Camera* (1897).

Savoring the historic past and vastly changing present through the photographic image appeared to inspire some photographers. In New England, during the 1890s, a number of quite gifted regional photographers took pictures of people at work, interesting local events, and beautiful views. One such photographer, Henry S. Wyer, ca. 1890–95, published a number of books illustrating the sights and characters of his native Nantucket. Wyer's book, *Nantucket: Old and New* featured local townsfolk at their occupation.

Contrasting somewhat in purpose, photographically illustrated books about the American West aspired to attract new residents and tourism to the developing frontier. Illustrated government publications about the American West using the halftone printing process were widespread by the early 1890s. Most books of the West followed one of four main categories: private memorial projects to commemorate an individual or their adventure, commercial business enterprises geared to attract new pioneer settlement, historical documentation of local interest, and books or manuals aimed at promoting tourism.

Government published books on the peoples and places of the western frontier bring together historical and statistical data coupled with photographic illustrations. Two such books were published in conjunction with the demographic report of the 1890 census, *Moqui Pueblo Indians of Arizona and Pueblo Indians of New Mexico* (1893) and *Report on Indians Taxed and Indians Not Taxed* (1894).

During the final decade of the century, photographically illustrated children's books continued to be a popular form of expression among amateur photographers.

Photographic images advanced the narrative of nursery rhymes, poetic verse and prose. When illustrating a text, some photographers considered their subject by recording the story setting, while others enacted staged realities or *tableaux vivant*. Photographically illustrated children's books were popular as keepsake mementos and not necessarily intended for children even though children were the subject. Amateur photographers gravitated toward the genre of photographically illustrated books for children. Mary A. Bartlett produced three such books in the decade, *Old Friends with New Faces* (1892), *Mother Goose of '93* (1893), and *A Girl I Know* (1894). The first two featured allegorical narratives depicting young children within a domestic setting acting out nursery rhymes. Bartlett integrates calligraphic text with charming photographs printed in the gravure process on tipped-in Japanese rice paper. *Mother Goose of '93* was

promoted as a souvenir, available at three locations at the World's Columbian Exposition. *A Girl I Know* is an homage to Bartlett's teenage-daughter Madelon shown in cap and gown on the occasion of her graduation. Each of Bartlett's books was published in an edition of 500 by Joseph Knight Company of Boston who appears to have been a major producer of the children's book genre.

Photographically illustrated children's books appear to have been authored equally by men and women. Alexander Black produced at least a half-dozen in the 1890s; his *Captain Kodak: A Camera Story* published in 1899 references the craze for amateur snapshot photography. In addition to Black, two of the more highly recognized photographers producing books related to children's themes were Lewis Carroll, *The Story of Lewis Carroll* (1899), and Rudolf Eickemeyer, *In and Out of the Nursery* (1899).

The idea of combining photography with poetic verse was taken up by Helen E. Stevenson when she published a book, *Pictures from Nature and Life* (1894) of her photographs coupled with poetry written by her twin sister, Kate Raworth Holmes. In part a personal diary the book appears intended for a very private audience yet some of the themes are universal. The images recall the sisters' personal experiences traveling to romantic castles in England, a pair of happy lovers, a young bride dressed for her wedding day, and a mother cradling her child. Dedicated to their mother, the sister's drawing-room book offers a sentimental view of family life.

The late nineteenth-century interest in all things *japonisme* reached its apogee in the Mikado edition of J.B. Millet Company's *Japan: Described and Illustrated by the Japanese* published in Boston between 1897 and 1898. Possibly the last great book to be illustrated entirely by original photographs, the ten folio volumes, sumptuously bound in Japanese silk brocade and lace are illustrated with a plethora of tipped-in photographs. Published in 250 copies, each set featured ten brilliant full-page color collotypes of Japanese flowers by Ogawa Isshin (1860–1929), sixty full-page hand-colored albumen prints individually mounted and matted with tinted, and some two-hundred smaller hand colored albumen prints mounted within the text. This enormously complex publishing project was at once a summation of the cultural and political interchange between Japan and American in the late nineteenth century.

MARGARET DENNY

See Also: Emerson, Peter Henry; Dodgson, Charles Lutwidge (Carroll, Lewis); and Women Photographers.

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BOOL, ALFRED (1844–1926) AND JOHN (1850–1933)

Studio owners

The Bool brothers, Alfred Henry & John James opened two studios in London's Pimlico in the 1860s. In 1875 they were commissioned by Alfred Marks (1833 –1912) to take the initial series of negatives for the newly established Society for Photographing Relics of Old London. Each series consisted of 6 carbon prints, specially printed by the firm of Henry Dixon. Series 1, 1875, contained views of the Oxford Arms coaching inn; Series 21876, views of Lincoln's Inn; Series 31877 views in the Smithfield area; Series 4 views of Temple Bar & Gray's Inn Lane.

From Series 5 1879, however, both negatives and prints were made by Dixon alone. Each series was increased to 12 prints, and from 1881 brief texts were included with subscribers' copies.

Alfred Bool died in Wimbledon on December 91926; he was an early advocate of women's employment in photography. John Bool continued the brothers' Pimlico studio on his own until 1918; he died on the premises on December 14 1933.

DAVID WEBB

BOTANICAL PHOTOGRAPHY

A true history of botanical photography begins well before the 19th century, and even before the invention of photography as we know it. The desire for nature to be able to reproduce itself is ancient. Often credited with the one of the first observations of this phenomenon, Aristotle, during an eclipse, described seeing an image of the sun projected through tree leaves onto the ground. Acting as a primitive camera obscura, nature seemed to act out the title and philosophy of one of the earliest photographic books, "The Pencil of Nature."

As photography literally means "sun writing," it is no surprise then that some of its earliest subjects were of a botanical nature. A British scientist and one of photography's earliest practitioners, William Henry Fox Talbot (1800–77), used flowers during his first experiments. As he wrote to a botanist friend about his discovery, "I believe that this new art will be a great

von Gerlach & Schenk. Plum Blossoms.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

help to botanists…especially useful for naturalists since one can copy the most difficult things with a great deal of ease…I have practiced this art since the year 1834." Vegetation made for a perfect subject for typically long photographic exposures: they were inexpensive and they did not move. Prior to photography, woodcuts were the primary method for plant illustrations, yet most were not drawn from life and thus inaccurate.

At first one would think black and white photography less than ideal for reproducing such a vibrant entity as flowers. Although the autochrome process was not perfected until 1907, early experiments often used botanical specimens for their rich variety of hues. André Louis Ducos Du Hauron utilized leaves, stems, and flowers in an early attempt at a three color carbon assembly print. Later developments in light sensitivity allowed film, normally overly sensitive to blue, to more accurately reproduce more natural tones.

Botanical photographers drew from many sources—both scientific and aesthetic. Dutch painters had long turned to the exact copying of still-lifes. In French, still-life was literally "dead nature." Other prototypes for the botanical photographer included tromp-l'oeil paintings in the manner of William Michael Harnett and the Peale family. Meant to be hung in dining rooms, these pieces, like the Dutch "breakfast piece," were intended to speak of the bounty of nature as well as their host. The Victorians saw in flowers a symbolic vocabulary. Dubbed the "language of flowers," many ladies used small bouquets called "tussie mussies" to express their emotions. Like these varied precedents, 19th century botanical photograph also had a touch of "*vanitas*," or the brevity of life and, "*memento mori*," or a reminder of death. The photograph preserved forever short-lived blossoms. For this reason, documenting extravagant floral casket sprays was also common.

Relatively little is known about the small cadre of botanical photographers even at the height of their activity (1860–1880s). Pietro Guidi's stark albumen prints evoke subsequent examinations in their stark insistence on form. Richard Tepe's images share affinities with shadowy pictorialist studies. Other lesser names such as Eugène Colliau, Eugène Chauvigné, and Tony Boussenit, commingle with other anonymous artists working in the same vein. Some travel photography outfits based in exotic locations, such as Scowen and Co., specialized in recording rare specimens for museums. Numerous others, including British was photographer Roger Fenton, did at one time produce still-lifes as brief ventures into the realm, but few devoted their entire careers to the botanical. Four photographers, however, Anna Atkins (1799–1871), Adolphe Braun (1812–1877), Charles Aubry (1811–1877), and Karl Blossfeldt (1865–1932) seem to have come to define the genre.

Starting in 1843 and for the next ten years, Atkins collected and documented all the known species of algae in the British Isles with the help of her father, John Children, and her friend, Anne Dixon. Using the camera-less contact printing method of the cyanotype (also known as the blueprint), she made thousands of plates that were later bound into albums. The blueprint process not only recorded an exact replica to scale, but the intense color suited the subject well. The French textile designer Braun, also worked on a large project, yet for different reasons. Intending them as aids for the decorative arts, Braun completed a six-volume work of 300 photographic studies of flowers. His efforts met

with so much success at the 1855 Exposition Universelle that he left to pursue photography full-time, eventually opening a tourist photography firm. Like Braun, Aubry was trained as an industrial designer. As he explained in his *Studies of Leaves* (1864), his photographs were meant to "facilitate the study of nature, I caught it in the act, and I hereby offer to workers some models that may increase our productivity in the industrial arts."

Although most of his pioneering efforts occurred during the 20th century, mention must be made of German botanist, teacher, and sculptor Blossfeldt. Blossfledt began as an ironworker during the height of the German equivalent of the Art Nouveau movement. In 1890, he accompanied his professor to collect plant specimens for the purpose of lecturing on design. Self-taught in photography, Blossfeldt photographed primarily foliage for over thirty-five years. After taking his first photographs in 1896, he later reproduced his lantern slides in two books: *Urformen der Kunst* (Archetypes of Art, 1928) and *Wundergarten der Natur* (The Wonder Garden of Nature, 1932). Appearing against a background of either light or dark gray, Blossfeldt's studies emphasize sculptural form and graphic qualities.

During the waning years of the 19th century, flowers were used allegorically, in the manner of symbolist painting, or for purely formal modernist arrangements. Dreamy-eyed youths stared languidly into poppies in the works of F. Holland Day and lilies floated in bowls—all under the characteristic haze of the pictorial aesthetic. The linear quality of Asian prints also influenced photography in their inclusion of botanical motifs. It would not be until the 20th century, with photographers such as Imogen Cunningham, that the solo flower, namely the calla lilly, and its simple abstract quality would come to the fore.

LESLIE K. BROWN

See Also: Talbot, William Henry Fox; Still Lifes; Braun, Adolphe; Aubry, Charles Hippolyte; Expositions Universelle, Paris (1854, 1855, 1867 etc.); Day, Fred Holland; Anna Atkins; Charles Aubry; Books Illustrated with Photographs; Adolphe Braun; Cyanotype; Eugène Colliau; André Louis Ducos du Hauron; and William Henry Fox Talbot.

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BÖTTGER, GEORG (1821–1901)

German photographer

Georg Böttger was born in Hildburghausen, Thuringia on 9 July 1821. He was first a lithographer and engraver, before beginning as a portrait photographer in Nuremberg and Erlangen in 1850. In 1852 he moved to Munich, specialising in architectural images of monuments erected by Ludwig I and Ludwig II in Munich and Bavaria, and later teaching photography and selling collodion dry plates and photographic equipment. In 1854 he participated in the *Deutsche Industrieausstellung* [German Industrial Exhibition] in Munich. Named photographer to the Bavarian royal family in 1872, Böttger was well known for his landscape and city views as well as his art reproductions. One of his most famous works is a monumental 360-degree, 460-cm long panorama of Munich taken in 1858 from the tower of St Peter's church. Lesser known, but important was his documentation of railroad engineering and bridge building activity in Bavaria at the end of the 1860s. Much of his photographic work resides in the *Stadtmuseum* Munich and the *Deutsche Bahn* [German Railroad] *Museum* Nuremberg.

STEFANIE KLAMM

BOURDIN, JULES ANDRÉ GABRIEL (1832–1893)

French photographer and inventor

Jules Bourdin earned his place in photographic history with what has subsequently been recognised as the world's first 'instant picture camera'. Bourdin was a Parisian photographer who made little mark with his images, but a significant name for himself with his innovative camera designs.

The Dubroni No.1—the name is an anagram of Bourdin's own surname—which he invented and patented in 1864, was a novel camera designed for wet collodion photography which permitted the processing of the collodion plate to take place within the camera body, thus freeing the travelling photographer from the need to carry on location all the paraphernalia usually associated with wet plate operation in the field. In Britain, the smallest size Dubroni outfit, complete with an instruction book, could be purchased for £2. It was one of a significant number of camera designs which he marketed from the early 1860s until into the late 1880s, and by far the most important historically.

Contrary to many written accounts, however, it was not the first such design. William Henry Fox Talbot proposed a design for a daguerreotype camera with an integral processing facility as early as 1839, and Antoine Claudet suggested a similar design two years later. For collodion photography, the first camera with integrated processing was suggested by William Newton in 1851, and the inventor of the wet plate process, Frederick Scott Archer became the first to put such an idea into practice with his original camera design of 1853.

What made the Dubroni camera successful, when introduced a quarter of a century after such an instrument had first been suggested, was the compactness of its design, and the simplicity of its operation. While earlier suggestions involved designs in which large processing tanks were suspended beneath the back of the camera, Bourdin's design used the camera body itself as the sensitizing and processing chamber. So successful was the idea, that Bourdin eventually manufactured and marketed the camera in at least five different sizes, from the smallest which took a plate 45mm square, through quarter plate, to the largest which equated with a 'postcard' format of approximately 88 × 127mm.

The camera was of a simple wooden box design inside which was a ceramic or glass lining, with a bowl shaped recess at the bottom to contain the sensitising and later the processing chemicals. The glass negative plate, already coated with collodion, was placed against the open back of the ceramic lining, and held in place by the hinged back plate of the camera. The silver nitrate sensitizer was introduced via a pipette at the top of the camera, and allowed to flow over the collodion plate by tilting the camera on its back. The excess sensitizing solution was sucked out using the same pipette, and the camera was ready for exposure.

The camera was fitted with an f/4 lens, permitting exposures on the small plate of about three to five seconds outdoors, after which, the lens cap firmly back in place, the camera became the processing chamber.

Pyrogallic acid was used to develop the plate–again introduced through the top via a pipette–and the camera tilted on its back to facilitate development. As the camera back was fitted with a red or yellow glass inspection hatch, the progress of the development could be checked visually. After the developer had been sucked out, a conventional 'hypo' fixer was introduced, and the camera tilted on its back again.

The camera's major drawback was the rigorous cleaning which was required before a new plate could be fixed to the back, and a second exposure made as any trace of hypo left in the camera body would ruin the next exposure.

JOHN HANNAVY

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BOURNE, JOHN COOKE (1814–1896)

English engraver and photographer

John Cooke Bourne was born in London on September 1st 1814, the son of a hat-maker in Covent Garden. He became a pupil of the J M W Turner's favourite engraver John Pye in the 1830s, and was quickly recognised as an accomplished artist in his own right.

Bourne was commissioned to illustrate the construction of the London and Birmingham Railway, and later the Great Western Railway, and his plates, drawn with the aid of the camera lucida, have a quality which today would be described as photo-realistic.

In 1848 he was commissioned by the engineer Charles Blacker Vignoles, initially as an artist and later as both artist and photographer, to chronicle the construction of the first permanent bridge over the River Dneiper in Kiev. The project involved weekly photography of the project from late 1848 until the bridge's completion in October 1853. The images represent the first such use of photography to record progress. In 1852, Roger Fenton worked alongside him in Kiev. A small number of Bourne's images survive. They were exhibited in London in 1854 and 1855.

In 1855 Bourne was granted a patent for a novel camera design with integral processing which was lightweight and could be collapsed into a small case for travelling photographers. No images produced with such a camera have yet been located.

JOHN HANNAVY

BOYER, ALDEN SCOTT (1887–1953)

Born in Iowa on January 29, 1887, Alden Scott Boyer was an important and enthusiastic collector. His professional life began as a pharmacist, which led him to open a business in Chicago specializing in chemical products, perfumes, and cosmetics. Collecting dominated the pri-

vate sphere of his life. His collecting interests ranged from coins to curiosities, including photography and related publications. Boyer's collection, the "Alden Scott Boyer Museum for the Preservation of American Curiosities (Free)," was housed in a bank building in Chicago. His intense interest in photography began after reading *Photography and the American Scene* by Robert Taft in 1938. Boyer acquired many items from dealers and scouts in several countries. Additionally, he contacted the descendants of many photographers, such as Southworth and Hawes, to procure images, documents, and ephemera from their careers. Boyer also sought out relationships with photographic scholars and collectors. One such association with Beaumont Newhall led Boyer to donate his photographic collection to The George Eastman House in 1951. The 4½ tons of what Boyer called "photo junk" became a foundation for the history of photography. Boyer died on June 16, 1953 in the bank building that housed his remaining collection.

SARAH TEMPLETON

BRADY, MATHEW B. (1823–896)

American photographer

Few reliable facts are known about Mathew Brady's early life other than he was born to Andrew and Julia Brady circa 1823 in Warren County, New York. His father had immigrated to the United States from Ireland and made his living as a farmer in the southern Adirondacks. By 1840 Mathew had moved to New York City, and may have studied with the artist and inventor Samuel F.B. Morse. In 1843 he manufactured cases for jewelry, miniatures, and daguerreotypes. A year later, he opened his first daguerreotype studio on the corner of New York's Broadway and Fulton Streets, near P.T. Barnum's museum.

Among the dozens of daguerreotype studios operating in New York City in the 1840s, Brady's Daguerrean Miniature Gallery was one of the most prominent. Immediately after opening his studio, Brady received widespread recognition for his daguerreotypes. Beginning in 1844 and continuing throughout the decade he regularly received awards at the annual American Institute fairs. The New York City fairs, which promoted advancements in agriculture, commerce, manufacturing, and the arts, included exhibitors from across the United States. Indeed, in the 1840s and 1850s Brady's work was praised for its artistic qualities both nationally and abroad. Countless New York celebrities frequented Brady's studio. The portraits displayed on his gallery walls represented a "Who's Who" of American notables, including politicians, actors and actresses, writers and artists, and religious leaders. Through his association with these famous sitters, Brady became the first celebrity photographer. He lured famous sitters to his studio with the promise of a complementary daguerreotype, if they allowed him to keep one for display in his gallery. The general public flocked to his studio, excited to view portraits of famous personalities, and to be seen by the other visitors. His gallery provided an educational, experience for the emerging middle class who not only became more familiar with important Americans, but also joined them by having their own portrait made at Brady's studio.

Due to his poor eyesight, Brady usually did not operate the camera himself. Instead, he thoughtfully posed his sitters and made them feel comfortable during the procedure. In the January 1851 issue of *The Photographic Art Journal,* art critic C. Edwards Lester wrote: "While he offered inducements to the best operators and chemists to enter his studio, he superintended every process himself, and made himself master of every department of the art ..." Some of his camera operators and gallery managers became well-known photographers, including George S. Cook, who ran Brady's New York City gallery in 1851 when Brady traveled to Europe and Alexander Gardner who, in 1856, was hired to work in Brady's New York studio.

As his reputation grew, Brady moved his original New York studio to larger and more prestigious locations on Broadway. His later studios were celebrated for their richly appointed reception rooms and extensive portrait galleries. Photographs were displayed floor to ceiling, along with large portraits in oil of prominent Americans, their likenesses based on Brady daguerreotypes. The darkroom and finishing rooms were located away from public view. Brady pioneered in the use of skylights to increase the natural light entering the studio, reduce exposure time, and produce evenly lit portraits. Most of his daguerreotype portraits are bust-length, with the sitter's face angled slightly away from the camera. Brady's early images usually do not include props, but his later studio portraits regularly use a variety of props, including chairs, a table, an ornate gold clock, books, a column, and drapery.

In 1848 Brady opened a studio in Washington, DC, hoping to attract members of the U.S. House and Senate and to add to his growing collection of portraits. Among the personalities he photographed were President Zachary Taylor and his cabinet. Brady's original Washington studio was not financially successful and he was forced to close it within the year due to high operating expenses and competition from other experienced studios, such as the one run by John Plumbe, Jr. Ten years later, Brady was more fortunate when he opened a studio on Washington's Pennsylvania Avenue. Alexander Gardner successfully managed this studio, combining business skills with his talent as a photographer.

Brady met his future wife, Juliette Handy while in Washington, where they were married at the E Street Baptist Church. The exact date of their union is unknown. However, in 1851 he and his wife traveled to England, attending the Crystal Palace exhibition in London, where a group of his portraits of famous Americans was on display. He received a bronze medal for overall excellence.

During the daguerreian era, Brady's most significant undertaking was the publication of *The Gallery of Illustrious Americans*. This series of twelve lithographs by French artist Francis D'Avignon from daguerreotypes by Brady was among the most handsome publications of its time. Subjects included Daniel Webster, John C. Fremont, and Henry Clay. Brady's project differed from other series of printed portraits of the time, which were based on portraits in oil, and thus believed not to convey as truthful a likeness as those made from daguerreotypes. The publication received many positive reviews. The 2 March 1850 *Living Age* reprinted a review from the *Evening Mirror* of the first lithograph in the series, a portrait of General Zachary Taylor. It stated: "There are so many pompous announcements made of enterprises which are never carried out, and so many pledges given of this kind, which are never redeemed, that we can hardly express our satisfaction, on finding that the first number has more than made good on all the promises which were given." It continues: "... the whole work, surpasses anything that we have ever seen as a specimen of the art of typography." Subsequent prints were praised for their beauty as well as the lively and concise accompanying text. In spite of the quality of the publication and the extensive praise it received, sales were weak. The publication, which had planned to include twenty-four printed portraits, was discontinued after twelve.

In the mid-1850s photographic technology changed and Brady began to use glass plate negatives to produce multiple salted paper and albumen prints. He specialized in large "Imperial" portraits which were much easier to view than the mirrored surface of the small daguerreotype plate. (Imperial prints measured up to 22 × 17 inches compared with 6½ × 4¼ inches for a half-plate daguerreotype.) Later, when the *carte de visite* format became fashionable, Brady marketed his portraits of famous people to the general public who delighted in collecting these cards and placing them in albums.

Throughout his career, Brady's photographs were widely reproduced in the leading journals of the day. Both *Harper's Weekly* and *Frank Leslie's Illustrated Newspaper* used woodcuts based on Brady images to illustrate articles on politics and the arts. Both of these periodicals used Brady's first portrait of presidential candidate Abraham Lincoln, made on 27 February 1860, the day of the latter's pivotal lecture at New York's Cooper Union hall. Brady published this image as a *carte de visite*, and after his victory, Lincoln claimed: "Brady and the Cooper Institute made me President." The Brady studio frequently photographed Lincoln's family and his political associates during his presidency.

Brady, Matthew. Commodore Matthew Calbraith Perry. *The Metropolitan Museum of Art, Gilman Collection, Purchase, Joseph M. Cohen Gift, 2005 (2005.100.84) Image © The Metropolitan Museum of Art.*

Brady's most important contribution to American history was his documentation of the Civil War. In 1861 he began sending photographers into the field. Many of the best Civil War photographers got their start working with him. Alexander Gardner and James F. Gibson transferred their studio skills to working outdoors, making conventional portraits, scenes in camp, and views of the aftermath of battlefields. Photographers were outfitted with portable darkrooms to process their wet-plate negatives in the field. Actual battle scenes were technically impossible to photograph, but the devastating impact of the war was nonetheless documented. Photographs of dead soldiers after the battle at Antietam were displayed at Brady's Broadway gallery where visitors were shocked to see such graphic depictions of war. After the war, Brady's views were displayed at the New-York Historical Society. A 30 March 1866 review of the exhibit in the *New York Times* reported "The faithful camera ... has written the true history of the war .... It is not merely what these representations are to us, but what they will be to those that come after us." General Ulysses S. Grant

stated: "... the collection will be valuable to the student and artist of the present generation; but how much more valuable it will be to future generations." Brady hoped to market these images to the public, but after the war there was little interest in purchasing views of a conflict that most were ready to forget.

Brady's business began to suffer during the war. In an effort to obtain a more complete set of Civil War negatives for his use, Brady purchased or copied negatives from other photographers, and assumed credit for the images. This was a common practice at the time, but it alienated Brady from some of his peers. While Brady became famous, his talented operators remained anonymous. In 1862 lack of credit prompted Alexander Gardner to leave Brady's studio and start his own business. After the war, he published *Gardner's Photographic Sketchbook of the War*, dutifully crediting each photographer and printer on the photographic mounts.

In order to keep his photographers supplied during the war, Brady entered a relationship with Edward and Henry T. Anthony, a photographic supply and publishing firm. Brady acquired photographic supplies from the Anthonys, using his negatives as collateral. The Anthonys published *Brady's Album Gallery,* a series of *carte-de-visite* from Brady's negatives, making copies of Brady's portraits widely available to the public. Although Brady received royalties based on the sale of the *carte-de-visite*, the Anthonys retained the negatives. As Brady's financial situation deteriorated, the Anthonys acquired thousands of his negatives which they continued to print for nearly twenty-five years. Brady was never able to regain ownership of these negatives. Over the years, these negatives changed hands many times, until 1940, when they were purchased by the Library of Congress.

After the war, Brady's studio was unable to maintain its high standards, and it lost favor with the public. His former employee, Alexander Gardner, was now one of his main competitors. In debt and unable to pay his creditors, in 1867, after operating for nearly ten years in Washington, Brady was forced to sell a portion of the studio to James F. Gibson, his studio manager. Brady declared bankruptcy the following year, but was able to repurchase his Washington studio with the proceeds from the sale of his home in New York. By 1873, however, he had lost both his New York and Washington studios, and the following year his stored property was sold at auction. More than 2,000 of his glass plate negatives were purchased by the War Department and in 1875 Brady sold an additional group of material to the War Department for $25,000. Even the poet Walt Whitman supported Brady's effort to sell his collection to Congress. He wrote: "... these typical men gathered together from opposing parties and convictions, representing in their varieties and oppositions after all a Common Country-seems to me peculiarly appropriate to the Library of the Capital." In 1940 this material was transferred to the National Archives.

With the proceeds from his sales to the government, Brady remodeled his Washington studio. A few prominent political figures familiar with Brady's reputation visited the studio, but it never regained its earlier popularity. His nephew, Levin Handy, carried on the day-to-day business, but it was not long before Brady was in financial trouble again. In November 1881, Brady's National Photographic Art Gallery on Pennsylvania Avenue closed its doors permanently.

In 1895 while crossing one of Washington's busy downtown streets, Brady was seriously injured in an accident with a horse-drawn carriage. After he recovered, he moved back to New York City. Brady was scheduled to present a magic lantern show on Civil War photography at Carnegie Hall, but he became ill with a kidney ailment. He died on 15 January 1896 and was buried at Congressional Cemetery in Washington, D.C.

Brady's career spanned the early history of photography. He utilized most of the nineteenth century processes in vogue during this time period, including daguerreotypes, ambrotypes, salt prints, and albumen prints. Major holdings of Brady's work are housed at the Library of Congress, National Portrait Gallery, Harvard University, Chicago Historical Society, and the National Archives. Brady's work is also held in numerous private collections.

Carol Johnson

Biography

Mathew Brady was born circa 1823 in Warren County, New York. In 1844 he opened a daguerreotype studio in New York City. From the start of his career, Brady realized the historical importance of photography and concentrated his business on photographing society's elite. Beginning in 1844 and continuing throughout the decade, his work was exhibited at the annual American Institute fairs. Brady's daguerreotypes of criminals were used to illustrate *Rationale of Crime* by Marmaduke Sampson. In 1850 *The Gallery of Illustrious Americans,* a joint project between Brady, C. Edwards Lester, and Francis D'Avignon, was published. The following year, Brady's work was exhibited at London's Crystal Palace exhibition. In 1853 Brady's work was exhibited at the New York Industrial Exhibition. In 1857 Brady's Imperial photographs were exhibited at the American Institute. Brady's staff photographed extensively during the Civil War. In 1866 these photographs were exhibited at the New York Historical Society. Brady published a catalogue of his well-known personalities and Civil War views in 1869 entitled, *National Photographic Collection of War Views and Portraits of Representative*

Men. It listed 700 Civil War views and more than 2,500 portraits. His work was exhibited at the 1876 Centennial Exhibition held in Philadelphia. After three decades of financial difficulties, Brady died on 16 January 1896. He is buried at the Congressional Cemetery in Washington, DC.

Brady's career spanned the early history of photography. He utilized most of the nineteenth century processes in vogue during this time period, including daguerreotypes, ambrotypes, salt prints, and albumen prints. Major holdings of Brady's work are housed at the Library of Congress, National Portrait Gallery, Harvard University, Chicago Historical Society, National Archives, and the New York Historical Society. Brady's work is also held in numerous private collections.

See Also: Morse, Samuel Finley Breese; Cartes-de-Visite; Gardner, Alexander; Plumbe, John, Jr.; and Anthony, Edward and Henry T.

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BRAGGE, JAMES (1833–1908)
English photographer

James Bragge (1833–1908) was born in South Shields, England and moved to New Zealand with his family, arriving in Wellington shortly after it had been made the seat of Government in 1865. Having established a successful portrait business, he soon became known for his excellent landscape studies which were very popular with residents and visitors to the Capital whose business brought them to Wellington. Bragge not only made a feature of having on hand a constantly changing selection of Wellington views in whole plate and *carte-de-visite*, but he mastered large format photography. His largest camera took a plate measuring 16 × 14 inches. It was not long before civic dignitaries called upon his talents and commissioned him to make a series of views which were officially entered in the Sydney and Melbourne International Exhibitions of 1879 and 1880/1881. These submissions earned him several awards. He also made a spectacular series of views of a district close to Wellington called the Wairarapa. Using a horse-drawn van which he had fitted out in a fully equipped darkroom, he made over a hundred 10 × 8 inch to 12 × 10 inch views which were later bound into leather albums. These photographs did much to direct the attention of land investors to the district's potential, the negatives of which are currently housed in the Museum of New Zealand—Te Pap Tongarewa.

William Main

BRANDSEPH, GEORG FRIEDRICH (1826–1915)

Georg Friedrich Brandseph was born May 5, 1826, in Stuttgart as illegal son of Friederike Brandseph. He received training in lithography, and in 1851 he could be found in the city's address book as "lithographer, silhouetteur, and painter." Around this time he gained knowledge in the daguerreotype process through Karl Reutlinger who lived in Stuttgart as well. The idea of a professional career in photography occured to him while living in Hamburg between 1852 and 1853. Before opening his own studio in Stuttgart in late 1853, Brandseph went to Paris and visited a number of important studios including the one of Adrien Tournachon's. Brandseph's studio in Stuttgart grew to an extraordinary size in the 1870s and was handed over to his son Hermann Brandseph (1857–1907) in 1884. G.F. Brandseph retired to Kennenburg near Esslingen and died on Nov. 24, 1915.

During his involvement with photography, Georg Friedrich Brandseph was a true contemporary. He started his Stuttgart business in 1853, and starting with the Daguerrean process, switched to Collodion processes the next year, and then later introduced the carte-de-visite to Germany as soon as it was available in Paris. The extraordinary size of his company—around 1870 is reported to have had more than 40 employees and reflects the variety of his engagements. Of course, he had a portrait studio but there were printing departments, as well and a publishing house, which took care of the many photographs Brandseph produced of Stuttgart's edifices, streets, and places. In addition to this, Brandseph was an expert draftman and a painter, too. Typical for his time, Brandseph encouraged the Wurttemberg ducal family to collect photographs and to begin with their own experiences as amateurs. When Georg Friedrich Brandseph resigned in favor of his son Hermann in 1884, he handed over one of the biggest studios in the German speaking countries of his time. Unfortunately, Hermann was not as prosperous. When he died at the

age of 50 in 1907, the business had already shrunk to small size.

ROLF SACHSSE

BRANDT, CHRISTIAN FRIEDRICH (1823–1891)

Christian Friedrich Brandt was born on July 1, 1823, in Schleswig as the second child of the bookbinder Christian Wilhelm Brandt. From 1837 to 1840, he learned the craft from his father and went journeying subsequently throughout the German countries. It is likely that he learned more of the craft of the graphic arts when he was traveling. When he returned to take over the father's workshop in 1848, he already had some basic knowledge in the Daguerreotype method. From 1852, Brandt worked as a photographer and dealer in photographic equipment in the town of Flensburg. During the first decade he ran his own workshop, between 1852 and 1863, there was nothing remarkable about Brandt's work except that he produced good quality portraits. In 1863, he reproduced the altarpiece of Hans Brueggemann at the Schleswig cathedral. It was with this commissioned photograph that he immediately became one of the leading figures in the interpretation of late medieval sculpture. His idea was to take the altarpiece apart and have the scenes taken under daylight conditions in front of a dark cloth and sometimes even under sunlight giving the figures more expression through shadows. The images were not sold before 1865. Before Brandt expanded his business by photographing other altarpieces and private collections of medieval art, he received a commission to take photographs of the German troops at the final battle of the Danish-German war. These photographs were reprinted over and over in the years of 1865 to 1866 and were very successful economically. In 1865, he was commissioned to photograph the collection of medieval sculpture of Gustav Thaulow in Kiel being published relatively successful in 1867. He returned to large reproduction campaigns of altarpieces in the Rhinelands by 1868 but these compaigns suffered from being published more than a decade later when he was bankrupt. From 1869 to 1883, he worked as a portrait photographer in Flensburg. Closing his workshop in 1883 and unable to work, Brandt's last years remained in total poverty and he and his wife lived in a number of the city's poorhouses; he died on June 3, 1891.

ROLF SACHSSE

BRAQUEHAIS, AUGUSTE BRUNO (1823–1875)

French photographer

Braquehais was born in Dieppe on January 1823. After having studied at the Royale Institute of deafs and mutes of Paris, he worked as a lithographer in Caen. Back in Paris in 1850, he met Alexis Gouin, photographer with whom he joined to make portraits, reconstitutions, colored daguerreotypes and stereoscopic images on plates. His official photographer's beginnings dated from 1851, when he appeared on the *Bottin,* the Parisian commercial directories. 1852 marked his first collaboration with Gouin's daughter, Laure, who was as well a photographer and colourist trained by her parents. She did the colouring on his pictures printed on oil cloth. The same year, he moved to his own studio rue de Richelieu, 110.

In 1854, he proposed and registered—for copyright purposes—seven numbered copies of artistic female nudes, printed out by E. Péruche and entitled *Daguerrian Museum*. His deafness is shown through these pictures in which the models seemed to be "alone" and isolated notably because of their theatrical stances and the numerous accessories (statues, veils, armours, paintings…) around them. In *La Lumière*, E. Lacan, even if he regretted the recurrent appearance of a Venus plaster, mainly noted about these images that it was

> … impossible to handle collodion more skillfully. His prints are altogether limpid. The lines are finely marked without being hard, the tones are both highly translucent and remarkably forceful; the modelling is at once well-defined and mellowed; the lighting is deftly handled, thus conferring striking relief to the forms, which we are made to see down to the last detail….

He supposedly married Laure upon her father's death in 1855 (the sources don't come to an agreement about the exact date of their wedding) and took over Gouins' studio with her and his mother-in-law at rue, Louis-le-Grand, 37. Mrs Gouin continued her miniaturist work and decided to sell Gouin's colours. The couple worked in creating nude figure studies and producing stereoscopic portraits. They specialized in daguerreotypes, a process they would be the last to use in Paris. At this level, their works looked the closest to Alexis Gouin's.

From 1863, following the death of Gouin's widow, the Braquehais set up to Boulevard des Italiens, 11, at the sign of *La photographie parisienne*. Bruno Braquehais then lived an intense period of activity. In 1864, he presented with Despaquis some carbon prints warmly received at the Société française de photographie. He also participated to several exhibitions: he exhibited his images in Berlin in 1865 and at the Paris Exhibition in 1867 where he received a honorable mention. Two years later, he teamed up again with Despaquis, author of "Carbon photography for amateurs" (Lieber, 1866), who had been granted Poitevin's carbon process patents and proposed him to produce the paper for L'arbon prints.

However it is above all because of *La Commune de*

Paris (1870–1871), very first event to be photographed in France—photographs on the War of Crimée and the Secession War had already been produced respectively by Fenton, Brady and Gardner—that Braquehais' name is known today. Publicly rediscovered at the time of the Centenaire (1971), his singular pictures were put into light again by Musée d'Orsay and Musée de Saint-Denis exhibitions in winter 2000.

In spite of the many technical restraints (equipment difficult to move, slowness of the exposure time…) and of the censoring against "all images propicious to disturb the law and order," Braquehais "escaped" from his studio and made about 150 negatives (whose only 109 were registered) of the event. In a context in which the great photographers of the period were almost absent and the commercial images by the studios Hyppolite Collard, Alphonse Liébert, Pierre Ambroise de Richebourg or Jules Andrieu Disdéri focused on ruins and fires, Braquehais also chose to photograph people. Indeed, even if these pictures are marginal (about 30) compared to his whole work on the subject (quite similar to the common production), his bystanders portraits and negatives of Fédérés with their families posing in front of the barricades, gave *La Commune* a human face and some "public celebrations" ways where all the generations and social classes were represented. Therefore, Braquehais is considered as one of the first reporter, *the* precursor of photojournalism in France. Naturally, the affinities he felt for the communards cause as well as the authorizations he could obtain to photograph some scenes thanks to his connivances can't be ignored and give rise to interrogation. Although no document or evidence can prove that he was put in charge of some mission by *La Commune*, Braquehais' work could be related to an arranged and methodical account of the event in favour of the communards… Anyhow, the Versailles troops at the Tuileries and in the Minister of Justice interior yard, the Fédérés at Porte Maillot, the cannons in Montmartre, the Maison Thiers destruction and the Colonne Vendôme demolition on the same-named place offer another point of view and remain among the most significant pictures of the event.

Before disappearing from the *Bottin* in 1874, Braquehais signed an advertising order for a clocks-maker in 1873— because of a lack of work ?—which were doing very few photographers in the 19th century. He went bankrupt this same year and was condemned for abuse of confidence. Locked away in Mazas prison during 13 months, he died at La Celle-Saint-Cloud without known heir(ess) on February 1875, a few days after his release.

Like the erotic photographs of this period, his artistic nudes are sold as postcards and his pictures of *La Commune* illustrate the textbooks relating this historical event often anonymously… His works can be seen at the Bibliothèque Nationale (Paris, Département des estampes et de la photographie), Musée Carnavalet (Paris), Musée de Saint-Denis, Bibliothèque Historique de la Ville de Paris, Budapest Museum, Agfa-Photo Historama (Cologne), Printenkabinett (Leiden), and in several collections such as Mack's (New York) or Nazarieff's (Geveva).

FRÉDÉRIQUE TAUBENHAUS

Biography

Bruno Braquehais was Born in Dieppe in 1823. Previously lithographer in Caen, he joined Alexis Gouin's parisian firm towards 1851 and made portraits, reconstitutions, colored daguerreotypes and stereoscopic images on plates. In 1854, settled in his own studio, he proposed artistic female nudes collected on the title : *Daguerrian Museum*. He married Gouin's daughter, Laure, who coloured his images and with whom he worked since 1852. His photographs draw attention in several exhibitions among which the Paris Exhibition where he get an award in 1867. During *La Commune de Paris* in 1870–71, whereas his colleagues focused on ruins after the fights, Braquehais participated to the birth of photojournalism making a real report of the event with the demolition of the Colonne Vendôme and the portraits of Fédérés and bystanders. Condemned in 1873 for abuse of confidence, Braquehais was locked away during 13 months and died in 1875 at La Celle-Saint-Cloud, few days after his release.

See Also: Daguerreotype; Gouin, Alexis; and London Stereoscopic Company.

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BRASSEY, LADY (1839–1887)

English author, photographer, and patron

Lady Brassey, born Anna Allnutt on October 7, 1839, near London, England, was a world traveler, writer, collector, and photographer. She was raised by her grandfather and educated at home by a governess. In 1860, she married Thomas Brassey, the son of a wealthy railroad baron and an avid sailor. Lady Brassey wrote five books based on her travels with her husband: *A Cruise in the Eothen* (1872), based on their voyage to North America, *A Voyage in the "Sunbeam"* (1878), recording their trip around the world, *Sunshine and Storm in the East, or Cruises to Cyprus and Constantinople* (1880), *In the Trades, the Tropics and the Roaring Forties* (1884) that recorded a trip to the Bahamas and West Indies, and *The Last Voyage to India and Australia in the "Sunbeam"* (1889), which was published posthumously. Her trips enabled her to pursue her interests in photography and botany. Seventy albums, filled with 6,000 photographs that were either purchased or made by Lady Brassey, document sites of interest on her travels. She also collected specimens and artifacts, which comprised the Brassey Museum in London, opened by her husband after her death at sea on September 14, 1887.

Andrea Korda

BRAUN, ADOLPHE (1812–1877)

The career of Adolphe Braun illustrates the close relationship that existed between art and commerce in the early years of photographic practice. It offers insight into the manner in which photography became both a commodity and a force for cultural change. Braun and his company were involved not only in making photographs, but also in developing alternative reproductive processes that would make the camera image available well beyond the individual silver print. Braun's activities represent in microcosm photography's early shift from craft to manufacture.

Like many of his generation, Braun began his career as an artist-draughtsman. A designer of floral decoration for the textile industry in his native region of Alsace, he soon recognized the camera's potential for improving decoration on fabrics produced there. In 1853, he began to use the newly discovered collodion-albumen process, which entailed a glass negative coated with a mixture of soluble gun-cotton and silver salts and a paper positive coated with egg white and silver salts to make studies of botanical specimens. Issued as *Fleurs Photographiés*, consisting of 300 large format photographs of flowers, it was followed by some two hundred smaller scale images of similar material. Besides their practical use, the photographs were recognized by the art establishment as having artistic value on their own.

The artistic and commercial success of this venture necessitated the creation of a workshop to make exposures, develop the glass plates, and print the images. Employing his sons Henri and Gaston, and several additional workmen, the factory established at Dornach (a suburb of Mulhouse) eventually produced all the materials other than paper needed to produce photographic prints. Additionally, it used steam driven machinery to mechanize processes that formerly had been done by hand.

In establishing this facility, Braun recognized the necessity of producing other photographic commodities than floral prints. Among them were *carte-de-visite* and cabinet size portraits, stereographic views, and panoramas. It is estimated the company produced some seven thousand stereographs (double images taken by a camera with two laterally placed lenses), which required a special viewing device (stereoscope) to create the illusion of three dimensionality; they were mainly landscape views. The popularity of painted panoramas in the mid-nineteenth century undoubtedly influenced Braun's decision to make photographic panoramas. Using a camera called a pantascope, modeled on a device patented by the English inventors John R. Johnson and John H. Harrison and improved by David Hunter Brandon, in the mid-1860s the company began to produce expansive views of Alpine scenery. These appealed not only to tourists, but to patriots celebrating France's acquisition of the mountainous region of the Savoy.

Besides experimenting with a variety of formats, the Braun Company undertook to produce a diversity of subjects. The floral prints were followed by other saleable subjects. These included scenic landscape views of Alsace, Germany, and Switzerland, posed costume pieces of the distinctive dress of peasants in the Swiss cantons, and views of Parisian streets. By far the most successful and enduring project undertaken by Braun and Company was the photographic reproduction of works of art housed in major European museums. Starting in 1866 with a selection of the master drawings in the Basel Museum, the project eventually embraced collections of paintings and sculpture in Florence, Paris, Rome, and Vienna as well as works by contemporary artists. The Braun *équipe* negotiated rights, arranged for scaffolding, paid gratuities, and coddled art critics in order to photograph in the Louvre, the Vatican, and the Albertina, among other venues. The art reproductions were meant to improve the taste of the French middle-class, only recently elevated from peasantry, by introducing it to the masterworks of western European art. Commercially marketed in France, Germany and the United States, Braun art reproductions also enabled art students to become acquainted with works of art that otherwise would have been inaccessible. By making available throughout the world identical reproductions

of a unique work, this aspect of photography made possible the discipline of art history.

The reproductions of drawings were especially accurate because they were printed by special processes that replicated the color of the original and also did not fade. Recognizing the impermanence of albumen prints, which tended to discolor depending on how carefully they were processed and kept, the Braun Company experimented with non silver methods of printing. They turned first to Woodburytypes and then to carbon printing. Both methods were based on early discoveries by the amateur Scottish scientist Mungo Ponton that potassium bichromate (now called dichromate) hardened when exposed to light. The Woodburytype, named for its English inventor Walter B. Woodbury, used dichromated gelatin to form a relief matrix, from which a print could be produced under pressure. Made without screens or any particulate matter, it was exceptionally accurate, but required trimming, which increased production costs. Following improvements to the sensitivity of dichromated potassium by Edmond Becquerel and the addition of carbon black coloring matter by Alphonse Poitevin, the carbon process took shape. It was made practicable finally by the manufacture of carbon tissues in various colors by a company set up in London by Joseph Wilson Swan. In 1866, Braun purchased a franchise for carbon printing in Belgium and France, and the art reproduction business entered a period of growth. Despite three wars fought in the region of Alsace, the Company, which eventually substituted gravure printing for the carbon process, produced art reproductions up through the mid-twentieth century. In an effort to demonstrate the artistic potential of photography, Braun also produced a number of large-scale original compositions based on popular "after-the-hunt" scenes. The Braun enterprise symbolized the idealism felt by many nineteenth-century artists, inventors, and scientists that photography would bring untold cultural and economic benefits to ordinary people.

NAOMI ROSENBLUM

Biography

Jean Adolphe Braun was born on June 13, 1812 in Besançon, France to Antoinette Regard and Samuel Braun, a mounted police officer. He was the first of three siblings (Charles Nicholas Braun, born 1815 and Marie Barbe Madeleine, borne 1823). On the father's discharge from the police force in 1822, the family moved to the ancestral homeland in Mulhouse in Alsace. As an industrial center that specialized in the printing of textiles—especially cotton fabric—and wallpapers, Mulhouse offered young men training in design, chemistry and mechanics. The young Braun demonstrated talent as a draftsman and in 1828 was sent to Paris to complete his education in decorative design. In 1834, he married Louis Marie Danet, with whom he had three children, Marie, Henri and Louise. Also in 1834, with his brother Charles, he opened the first of several unsuccessful design partnerships, finally succeeding in 1840. Two years later he published *Recueil de dessins servant de matériaux, destinés à l'usage des fabriques des fabriques d'étoffes, porcelaines, papiers peints &. &. Dédiés à Mr. Daniel Dollfus par son ami A.Braun* [Collection of Designs Offering Materials Intended for Use by Manufacturers of Textiles, Porcelains, Wallpapers, etc. Dedicated to Mr. Daniel Dollfus by his Friend, A. Braun]. The dedication of the album, which consisted of thirty plates of drawings in black and white and some with color mainly of floral motifs reproduced by lithography, attests to his ongoing connections with the business community of Mulhouse, of which Dollfus was a member. On the premature death of his wife in 1843, Braun sold his Paris design studio and returned to Mulhouse. There, in the same year, he became chief designer in the studio of Dollfus-Ausset and married Pauline Baumann, the daughter of a famous horticulturist, with whom he fathered two children, Gaston and Marguerite. In 1847, Braun opened his own studio in Dornach, a suburb of Mulhouse, which became the headquarters for the expanding textile design business that counted English as well as French clients. In the early 1850s, Braun became interested in the newly announced collodion process of photography, which made possible the multiple reproduction of positive prints from the glass plate negative. To improve the floral decoration on textiles by presenting the actual appearance of botanical material, in 1854 Braun issued an album of three hundred photographic prints on albumen paper of cut flowers, shrubs, wreaths, fruit, leaves, and grasses entitled *Fleurs Photographiées* [Flowers, Photographed]. At the Universal Exposition held in Paris the following year, he exhibited a second series of prints. These were highly commended in 1856 in an article in *Le Moniteur universel* by Ernest Lacan, a leading critic of photography. In 1857, Ad. Braun et Cie, as the company was known, embarked on a project to photograph well-known sites and monuments in Alsace, completing *L'Album del'Alsace* [Album of Alsace] in 1859. From that date, also, the company began making stereoscopic views and landscapes taken in France, Germany, Italy, and Switzerland in various sizes and formats, including panoramas. These were taken by hired cameramen, among them his brother Charles and son Gaston. In 1867, Braun issued a series of large format images (32 × 24 inches) entitled *Panoplies de gibier* [After the Hunt Scenes], which were printed by the carbon method. Two years later, the company embarked on a project to produce small scale images in a variety of sizes and formats, entitled *Costumes de Suisse*

Braun, Adolphe. Deer and Wildfowl.
The Metropolitan Museum of Art, David Hunter McAlpin Fund, 1947 (47.149.54) Image © The Metropolitan Museum of Art.

[Costumes of Switzerland], a theme to which he returned in 1871 after the Franco-Prussian war when he portrayed two women costumed as Alsace and Lorraine. With sons Henri and Gaston supervising, a project to photograph artworks in museums occupied Braun from about 1866 on. The reproduction of works of art soon became the mainstay of the company, remaining so until well into the twentieth century. After Adolphe Braun died on December 31, 1877 (preceded by son Henri), Gaston Braun continued the work of the firm which underwent several name changes becoming Braun, Clément et Cie in 1889 and Braun et Cie in 1910.

See Also: Wet Collodion Negative; Woodburytype, Woodburygravure; Poitevin, Alphonse Louis; Collodion-albumen; Woodburytypes; Mungo Ponton; Walter B. Woodbury; Alphonse Poitevin; Joseph Wilson Swan; and Carbon.

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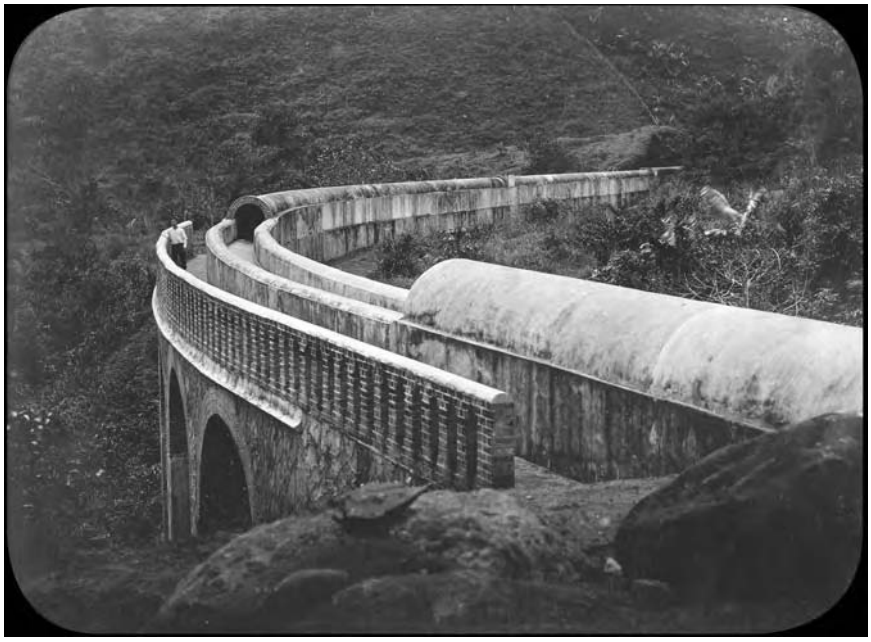
BRAZIL

The first reference in the Brazilian press to the invention of photography occurred on May 1st 1839, when the newspaper *Jornal do Commercio*, based in Rio de Janeiro, published an extensive article on the daguerreotype, which was officially unveiled in Paris later that year, on August 19th 1839. The new process of image-making was then introduced in Brazilian soil soon after its European announcement. In January 1840, the French abbot Louis Compte arrived in Rio de Janeiro on board the school-ship *L'Orientale* with a daguerreotype camera. He demonstrated the new medium by taking three pictures of the central area of Rio: one view of the Imperial Palace, another one from the Candelaria Market and a picture of the beautiful fountain nearby, designed by the Portuguese architect, Mestre Valentim. In March of the same year, the future Emperor of Brazil, D. Pedro II, who was then a 14-year-old boy, purchased himself a daguerreotype equipment, becoming the very first Brazilian photographer. Today we know very little about these early pictures taken by D. Pedro II. More significant is the fact that his great interest and enthusiasm for photography were fundamental to its development in Brazil. The Emperor not only supported various photographers around the country, granting the title of "Photographer of the Imperial House" to 23 professionals between 1851 and 1889, he was also the first Brazilian collector of photographs, accumulating during the course of his life more than 20,000 examples of Brazilian and international photos, representing a wide range of subjects. After being exiled from Brazil in 1889, D. Pedro II donated his precious collection to the National Library, based in Rio, where it is now kept, under the title of "Coleção D. Thereza Christina Maria," in homage to his wife.

The hallmark of the introduction of photography in Brazil is the fact that it was carried out mainly by foreigners—Americans and Europeans—who often changed their first names into the Portuguese version. Driven by the ambition of making money in a relatively new country, with very little competition, and lured by



Ferrez, Marc. The Curved Bridge of the St. Anthony River Aqueduct. *The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.*

the adventure of traveling to a tropical land, the first generation of foreign photographers found Brazil a virgin market. This situation determined much of the genres practiced in early Brazilian photography, mainly portraiture and landscape. And despite the technical difficulties of the times, they left some valuable bodies of work, still to be appreciated by a wider public. It is believed that the total production of photography in Brazil, in the 19th century was much bigger than what we know now. It is possible that many works were taken by the photographers back to their home countries or simply deteriorated due to neglect in public or private archives.

Many of these pioneer photographers spent just a few months or years in Brazil, establishing studios in urban centers and/or traveling through the provinces, in the search of casual clients. In the 1840s and 1850s, when the daguerreotype reigned as the dominant photographic technique, some of the most outstanding photographers were the American Augustus Morand, the German Francisco Napoleão Bautz, the Swiss Louis-Abraham Buvelot, the Portuguese Joaquim Insley Pacheco and the Hungarians Birayi and Kornis. Other exponents in the dawn of Brazilian photography were the German Revert Henrique Klumb, an early practitioner pioneer of stereoscopic photography in Brazil, and Frenchman Victor Frond, who in 1861 published the album 'Brazil *pittoresco*,' the first book with photographs made in Latin America.

In the 19th century, Rio de Janeiro, the capital of the Empire and a vibrant economical and artistic center, became invariably the main spot for making, selling and learning photography in Brazil. Also in Rio, photography made a very early appearance in the traditional arts frame, taking part in the 3rd General Exhibition of the Imperial Academy of Fine Arts, in 1842. On that occasion, owing to the lack of a specific category, like painting and sculpture, daguerreotypes were simply shown in the office of the Academy's director, the French artist Felix Emile Taunay.

In addition, the business of photography also flourished beyond the capital. Thanks to the brave initiative of a few individuals, it also spread out in more provincial cities and villages like São Paulo, Salvador, Porto Alegre, Recife and Belém. Some of the finest photographers who worked outside Rio are Albert Frisch, Militão Augusto Azevedo, Alberto Henschel, Guilherme Gaensly, Charles DeForest Fredricks, and Benjamin R. Mulock with his work on the building of the Bahia Railway.

From Rio de Janeiro emerged probably the most prolific and talented Brazilian Photographer of the 19th century, Marc Ferrez. Son of the artist Zepherine Ferrez, who came to Brazil in 1816 as member of the French Artistic Mission, Marc Ferrez learned his profession with German Franz Keller, from the prestigious studio Casa Leuzinger) and was appointed in 1860 as the official photographer to the Court. In 1865, he opened his own studio in Rio downtown, at the age of 21 years old. Ferrez produced an extraordinary amount of photographs, mainly portraiture and topographical work, the result of 50 years of intense activity. He is best remembered for his stunning views of Rio de Janeiro, but Ferrez was also an indefatigable traveler and recorded with his camera images of the large and diverse country.

It is a descendant of Ferrez, the historian Gilberto Ferrez, who can be regarded as the first great researcher of 19th century photography in Brazil. Gilberto Ferrez

started studying this subject in the 1940s, in a time when still very little was written about Brazilian photography. In 1953, G. Ferrez published an essay entitled "Photography in Brazil and its most dedicated user Marc Ferrez (1843–1923)," a seminal text that inspired Brazilian historians to investigate further and shape Brazil's own history of photography. Since then, and especially in the last two decades, studies of 19th century photography in Brazil have progressed and expanded, with new achievements in the form of publications and exhibitions, making the public more aware of the country's photographic heritage.

FABIO ADLER

See Also: Daguerreotype; Hentschel, Alberto; Mulock, Benjamin; and Ferrez, Marc.

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BRESOLIN, DOMENICO (1813–1899)

Italian painter and photographer

Domenico Bresolin was born in Padua in 1813. His father, also named Domenico, was a bricklayer. Domenico the son worked as a decorator and in 1841 enrolled at the Academy of Fine Arts in Venice. Here he studied with the architect Francesco Wucovich Lazzari, the painters Francesco Bagnara and Tranquillo Orsi, the sculptor Luigi Zandomeneghi. Around 1845 he studied in Florence with the Hungarian landscape painter Kardis Markò (1791–1860). During the same period he worked in Rome, where he showed his paintings in various exhibitions. Subsequently he continued working in Milan and in Venice as a landscape painter. After 1850 he began to take photographs using the calotype process and became famous for the clarity of his positive prints of Venetian palaces and monuments. His works became known mainly through Carlo Ponti, the photographer and publisher of famous Venetian photographers such as Carlo Naya and Antonio Perini. In 1864 he gave up photography and began teaching landscape painting at the Academy of Fine Arts in Venice. In the same year he transferred his photographic archive to Carlo Ponti. He had many pupils who later became famous painters, such as Guglielmo Ciardi, Giacomo Favretto, Alessandro Milesi and Luigi Nono. Domenico Bresolin died in Venice in 1899.

SILVIA PAOLI

BREUNING, WILHELM (1816–1872)

Friedrich Wilhelm Philipp Breuning was born on Dec. 20, 1816, as the son of a bookseller in Erlangen. After unfinished studies he pursued his first career as an actor, mostly in neighboring cities, like Nuremberg, Bamberg, and Wuerzburg. He seems to have taken up photography in 1843. In 1846, Breuning asked for permanent residency in the town of Hamburg where he already had opened a ball room in 1844. According to personal records, he may have spent a few weeks as an assistant to Carl Ferdinand Stelzner in 1844. Well known for his perfect production of daguerreotypes, Breuning was the first to announce the introduction of the calotype process in Hamburg. In 1847, W.B. moved to a large studio in St. Georg, Hamburg, where he stayed until his death on August 1, 1872. His studio was well kept by his widow Sophia Auguste until 1895.

Wilhelm Breuning is best remembered for a large number of daguerreotype images of people of prominence in Hamburg, e.g. the singer Jenny Lind, a numbered of famous actors, as well as scientists and visual artists. Compared to work of his contemporaries, the photography look astonishling friendly and well-tempered.

ROLF SACHSSE

BREWSTER, HENRY CRAIGIE (1816–1905)

Scottish soldier and photographer

Henry Craigie Brewster was the youngest son of Sir David Brewster. A career soldier, he joined the 76th "Hindoostan" Regiment of Foot in 1833. Brewster appears to have shared his father's scientific interests, for he was elected an honorary member of the St Andrews Literary and Philosophical Society in November 1840. He is first mentioned in the context of photography in July 1842 in a letter from Sir David to William Henry Fox Talbot. In this letter, sent from Leamington Spa, Sir David mentions that he is about to return to St Andrews, because his son, "a Captain in the 76th," has been granted leave from his regiment.

During this leave, Captain Brewster took part in the photographic experiments being carried out by the group of enthusiasts that had gathered around Sir David at St Andrews—Dr John Adamson, Robert Adamson,

William Holland Furlong and Hugh Lyon Playfair. In *The Home Life of Sir David Brewster,* a memoir of her father, Margaret Gordon records that Henry practised photography under his father's "superintendence." "It was one of [Sir David's] means of relaxation from heavier work," she recalls, "to take positives from the negatives of his son and others."

A letter of 22 October 1842 from Sir David to Talbot suggests that Captain Brewster played an important role in the early development of photography at St Andrews. In additon, this letter establishes that Brewster continued to practise photography after rejoining his regiment in Ireland. Sir David informs Talbot that his son, "who has got a fine camera from [Thomas] Davidson is now practising the Calotype with great success at Cork with his Regiment and I hope to send you soon some of his works." He mentions also that he himself had been very busy in the "secondary department" of taking positives from his son's negatives and that he had made "some essential improvements" in the process. Sir David goes on to mention Henry's "many successful experiments in applying *oil* to the *negatives*." "We have all tried this here," he continues, " but not successfully." "He, however, got into the way of doing it; and independent of the quickness with which it gives a positive in the darkest day, he finds that the *grain* of the tint is much finer, resembling the finest aquatints. There is great risk, however, of spoiling the negative, and he lost several before he succeeeded." Sir David concludes: "I regret that I cannot send you two of himself which my son and I took, he being the manipulator; because one of these has been thought by Dr Adamson and Major Playfair the best portrait done here, but I will desire him to send you them."

In a subsequent letter to Talbot, written on 2 November, Sir David writes: "Dr Adamson was here today with his little book of Calotype Gems for you, but he still requires to get a good positive of one of me before he can send it. What is the strength of your saline solution …? Do you *dip* the paper in the solution or *wash* it? And do you dry it in blotting paper, and is this blotting paper always new? Be so good as to answer these questions."

"My son writes me," he reports, "that he *never* fails in taking positives, by dipping in the solution." Six months later, on 1 May 1843, Sir David exhibited two series of calotype portraits at a meeting of the St Andrews Literary and Philosophical Society, "the one executed by Mr Henry Collen, London, and the other by Capt. Brewster 76th Regiment." Eight days after this meeting, he mentions his son once more in yet another letter to Talbot, writing: "My son Captain Brewster of the 76th has gone with his regiment to Plymouth; and he has been told that it is not lawful for him to practise the art in England.… I therefore promised to write to you to ask permission for him to Calotype for his amuseument." This is the last reference in Sir David's correspondence with Talbot to the photographic activities of Captain Brewster.

A self-portrait by Captain Brewster is preserved in the Graphic Arts Collection at Princeton University. This is presumably one of the portraits mentioned by Sir David in the aforementioned letter of 22 October 1842. Contemporaneous with this photograph is a portrait of Dr John Adamson, dated September 1842. This exists in several versions, including one in the Royal Museum of Scotland in Edinburgh. The principal collection of photographs by Captain Brewster is contained in the Brewster Album in the J. Paul Getty Museum. This group contains ten portraits of Brewster's fellow officers in the 76th Regiment of Foot and several architectural views depicting their barracks at Cork and at Buttevant. The portraits exemplify military bravado and discipline in equal measure, while the architectural views show a complex and sophisticated approach to light, space, and surface. In one of the views of Buttevant Barracks there appears to be snow on the ground and on the roofs of the buildings. The majority of these photographs must have been taken between October 1842, when Captain Brewster rejoined his regiment, and 1 May 1843, when Sir David exhibited them at the St Andrews Literary and Philosophical Society. The uniform worn by William Hugh Barton in one of these photographs suggests, however, that it must date after 6 October 1843, when Barton was promoted to Lieutenant. Also in the Brewster Album is an unattributed group portrait, in which Sir David appears with his daughter and with his son Henry, the photographer. This photograph was probably taken in St Andrews in 1845, when the 76th Regiment of Foot was stationed at Edinburgh.

GRAHAM SMITH

Biography

Henry Craigie Brewster was born in Edinburgh in 1816. An obituary published in *The Times* on 21 September 1905 records that he died at the Marine Hotel, North Berwick. "He was an enthusiastic golfer," remarked his obituarist, "and had a wide circle of friends, both in England and Scotland." The obituary records that Brewster formerly commanded the 76th "Hindoostan" Regiment of Foot and retired in 1872 without having seen war service. Brewster joined the 76th on 18 October 1833, his seventeenth birthday. His record shows that he was promoted to Lieutenant in 1836, to Captain in 1839, and to Major in 1858. He was appointed Lieutenant Colonel in 1863 and retired with the honorary rank of Major General. During the period he was active in photography, Brewster was stationed at Newry, Cork, Portsmouth, and Edinburgh. He served abroad in the West Indies, Bermuda, the Ionian Isles, Malta, and the East Indies.

See Also: Sir David Brewster; William Henry Fox Talbot; John Adamson; Robert Adamson; Thomas Davidson; and Henry Collen.

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BREWSTER, SIR DAVID (1781–1868)

Recognised as a pre-eminent natural philosopher far beyond the borders of his native Scotland, Sir David Brewster's reputation suffered in the course of his lifetime, until eventually he became a relatively forgotten figure in the history of science and photography.

David was the third of six children and the second of four brothers. His father, James Brewster (c.1735–1815) was a tutor at Dundee Grammar School and later became Rector of Jedburgh Grammar School. His mother, Margaret Brewster (1753–1790), died soon after the birth and death of her sixth child. David was only nine years old at the time. David and his three remaining brothers were then brought up by their sister, Grisel. All of David's brothers, James, George, and Patrick, were educated for, and eventually took, careers in the Church of Scotland.

The Brewster family considered education to be important, and from an early age David's appetite for learning was encouraged by adult scholars close to the Brewster family. As a boy, David read his father's old university lecture notes on physical science, and at the age of ten he built his first telescope with the help of astronomer, James Veitch (1771–1838), who lived nearby. As a youth David also became an aide to Dr Thomas Somerville, a local minister, scholar and author. All of this helped David acquire skills that would be of use in his future career as a writer and editor.

At the remarkably tender age of twelve, David began to attend the University of Edinburgh. Up until then it would have been fair to assume that David, like his brothers, was destined for a career in the Church. However, David was no public speaker. It is said that on one occasion he fainted, having being asked to say grace at a dinner party. This impediment may have helped lead towards a career in academia. In 1799 he began contributing to the *Edinburgh Magazine*, and in 1800 he graduated from university. In 1802 Brewster progressed to become editor of the *Edinburgh Magazine*, and remained so until around 1807. About this time he began experimenting in optics, and made unsuccessful applications for posts in mathematics at the universities of both Edinburgh in 1805, and at St Andrews in 1807. In 1808, poised on the brink of a successful scientific career, Brewster became the editor of the newly published *Edinburgh Encyclopaedia*. This was a useful post for Brewster. Not only did it put him in touch with other scientists who contributed to the encyclopaedia, it also helped him keep him up to date with new developments in the field.

Brewster contributed to the fourth, fifth, sixth, seventh and eighth editions of the *Encyclopaedia Britannica*, which was published in Edinburgh at that time.

Brewster's writing was not always intended for a specialist audience. His 'Treatise on Optics,' published in *Dr Lardner's Cabinet Cyclopaedia* (1831) was written for a general audience. As was his *Life of Sir Isaac Newton* (1831). This was followed by the larger, more scholarly *Memoirs of the Life, Writings and Discoveries of Sir Isaac Newton* (1855), which remained the best biography of Newton until recent years (1980).

On the 31 July 1810, Brewster married Juliet Macpherson (c.1776–1850), the youngest daughter of the alleged translator of Ossian's ancient poetry, James Macpherson (1736–1796). The couple had four sons and a daughter together. It was their daughter, Margaret Brewster (later Margaret Gordon, 1823–1907), who published a candid biography that is the main source of information on what Brewster was like as a person. Capable of charm, but also difficult at times, she describes Brewster as having a strong personality. Incidentally, he was knighted in 1832.

The beauty of the daguerreotype did not beguile the pragmatic Brewster. He considered Talbot's calotype to be superior because copies could be generated easily using cheap and simple materials.

Brewster was involved in photography from its very beginnings: he was in correspondence with W.H.F. Talbot from a number of years prior to when Talbot published his findings in 1839, and Talbot sent Brewster examples of his early photographic work from an early stage in its development. This association meant that the first place outside England to practise the calotype was St Andrews in Scotland. Also, Talbot did not patent his invention outside England on Brewster's advice. Although Brewster collected photographic prints and wrote fairly extensively on the subject he does not appear to have practised photography himself.

Throughout his life, Brewster was involved in setting up numerous societies, including the Society of Arts in Edinburgh, which later became the Royal Scottish

Society of the Arts, and the Edinburgh School of Arts which was the first of many mechanics' institutes which were to later be set up all over Britain. He also played an important role in the founding of the British Association for the Advancement of Science, which was founded in 1831 with the aim of lobbying the government to promote science in Britain. Brewster became its president in 1850, despite his old fashioned views on the wave theory of light. Brewster believed that science in Britain was in decline, while it was on the ascendancy in Europe, and wanted the government to help remedy the situation by financially supporting science and scientists. In 1838 he set up the St. Andrews Literary and Philosophical Society, where Talbot first displayed his calotypes. Talbot sent examples to Brewster through the post, thereby stimulating Brewster's interest in photography. Arguably, one of Brewster's greatest contributions to the history and development of photography in Scotland was the fact that Brewster helped teach Robert Adamson how to take photographs using Talbot's new calotype process, and then introduced Adamson to the painter, David Octavius Hill, thereby initiating a partnership that bore one of the most remarkable bodies of photographic images ever to be produced.

Brewster succeeded in increasing the resolving power of microscopes by using jewels for lenses instead of glass, but the development proved to be impracticable because of the increased costs involved (successful, but expensive).

Today Brewster is remembered for his work on stereoscopy, [and for the invention of the kaleidoscope]. He was not the first to invent a stereoscopic viewer, but Brewster did study the physiology of binocular vision, and did develop a device which made the viewing of stereoscopic photographs viable. Brewster's stereoscope was pre-dated by Charles Wheatstone, who was also interested in binocular vision. Wheatstone had succeeded in inventing a stereoscopic viewer prior to Brewster, and even before the invention of photography itself, in 1832. But Wheatstone's apparatus was large and relatively cumbersome compared to Brewster's stereoscopic device. Prior to the invention of photography, stereoscopic images had to be drawn, or created in a manner other than photography. But there was enough of a similarity between the two creations to cause conflict, and Brewster let his feelings towards Wheatstone be known when he published papers on his lenticular stereoscope, and his binocular camera, in 1849. In 1850 he took prototypes with him to Parisian opticians, Françoise Soleil and Jules Duboscq. They built a rudimentary stereoscopic camera, which produced daguerreotype photographs, and constructed a stereoscope viewer to accommodate them. They displayed these in London at the Great Exhibition in 1851, where they attracted the attention of Queen Victoria. So, an example was made and presented to Victoria by Brewster, in Soleil's behalf. This 'Royal Patronage' led to public demand and commercial success for Brewster's stereoscopic viewer. But Wheatstone and Brewster entered into a public quarrel conducted through the letter pages of *The Times*, over priority. Sir John Herschel summarized the situation when he said, 'Wheatstone invented the stereoscope; Brewster invented a way of looking at stereoscopic pictures' (N. J. Wade ed., *Brewster and Wheatstone on vision*, 1983, 36).

Brewster influenced the development of scientific instrumentation by improving existing devices, inventing new ones like the kaleidoscope and lenticular stereoscope. As a major figure in optical research he was able to influence patent law reform, and was invited to be part of the jury for the Great Exhibition of 1851 and for the Paris Exhibition of 1855. In his lifetime he published around 300 scientific papers, and over 1,200 books, articles and reviews. He was instrumental in enabling Talbot's new photographic process to be used free of patent restrictions in Scotland. In 1808 he was elected a Fellow of the Royal Society of Edinburgh and was its General Secretary from 1819 to 1828, and its President from 1864 until his death. In 1815 he was elected Fellow of Royal Society and was awarded its Copley medal (1815), Rumford medal (1818) and Royal medal (1830) for his work on optics and the nature of light. In 1820 he became a member of the Institution of Civil Engineers. In 1816 the French Institute awarded him a cash prize. In 1849 he was made one of only eight foreign associates of the Académie des Sciences. He was made a corresponding member of the French Institute, and of the Royal Societies of St. Petersburg, Berlin, Brussels, Copenhagen, Stockholm and Vienna. In 1847 he was awarded an Order of Merit by the King of Prussia. In 1855 he was awarded the Cross of the Légion d'Honneur by Emperor Napoleon III. This list of honours is not exhaustive.

Brewster's reputation as a scientist was considerable, until he began to outlive his contemporaries, and found himself unable to accept the new ideas coming from a younger generation of scientists, until eventually his refusal to relinquish an outmoded position based on a Newtonian theory of light became untenable. From then on his reputation began to suffer, until eventually, towards the end of his life, he was marginalized, and much of the important work he did was subsequently not attributed to him.

At the age of seventy-four, Brewster re-married. Jane Kirk Purnell (b. 1827) was the second daughter of Thomas Purnell of Scarborough. David and Jane had a daughter together. On the 10 February 1868, at the age of 87, Brewster died of pneumonia and bronchitis at *Allerly*, the house he had built outside Melrose, in the Scottish borders.

The principles of reflection that Brewster's kaleido-

scope make the most of had been known since antiquity, but Brewster attempted to patent the construction of a device manufactured in the from of a brass tube and sold as a toy (1819?). He foolishly entrusted his prototype to a London instrument maker, and the idea was leaked before Brewster had a sound patent in place. The result was other people made a lot of money on the back of Brewster's invention.

The kaleidoscope is a toy which uses simple principles of reflection noticed by Brewster when experimenting in 1816 … but." Brewster defended his "brainchild" in print, in a series of articles that appeared over the next few years in encyclopaedias and journals [to bolster his claim], culminating in the "grand" *Treatise on the Kaleidoscope* (1858). A patent was "expensively" obtained "which was negated when the enthusiasm of the London instrument maker to whom he had entrusted the prototype led to the principles of the device becoming known." His expensively produced brass tube was copied—he wrote to his wife, 'had I managed my patent rightly, I would have made one hundred thousand pounds by it!' (M. M. Gordon, *The Home Life of Sir David Brewster*, 1869, 97) … "first example of a national / fashionable craze … creation of markets in newly industrialized society.

Brian Liddy

See Also: Daguerreotype; Calotype and Talbotype; and Stereoscopy.

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BRIDGES, REVEREND GEORGE WILSON (1788–1863)

English photographer

George Wilson Bridges was born to an old established Essex family and like many eldest sons of the landed-gentry trained to become a member of the clergy. However, Bridges confounded his family by eloping to Scotland with Elizabeth Raby Brooks, marrying on 24th October 1815 at Gretna Green. The elopement and the fact that their first child, Henry, was conceived out of wedlock appears to be the major cause of his banishment to the colonies, becoming ostracized by his own family and eventual marital breakdown.

In 1816 Bridges accepted an appointment from the Governor General of Jamaica, William Montagu, to become the rector of St Ann's parish. Bridges was highly paid during his incumbency, according to William Henry Fox Talbot's mother, Lady Elizabeth Fielding (who knew Bridges); he was paid the then huge sum of £3,000 per annum (almost certainly an exaggeration). When in Jamaica Bridges wrote *The Annals of Jamaica* (1828) which was a history of the island and slavery and the British attitudes to it. Evidently Bridges was a staunch supporter of the slave trade and the book caused some controversy.

In 1834 Bridges' wife suddenly left Jamaica taking their son Henry and leaving Bridges to look after three daughters (another daughter was at school in England) and an infant son. Eight month's later Bridges returned to England to collect his eldest daughter and to try and find his wife. He stayed in Ireland with former Governor of Jamaica, Lord Belmore, for nearly a year and then returned to Jamaica. More tragedy was to follow when all four young daughters were drowned during a boating trip on New Year's Day 1837. Deeply distressed after this tragic event Bridges took his young son, William, who survived the boating accident, to Upper Canada (which was still a British Colony) where in 1837 he built Wolf Tower, an octagonal wooden tower house on the south shore of Rice Lake near Peterborough. In 1842 he left Canada with William, who was ill, for England. They took first ship they could find from Quebec, which took the pair to Palermo, Sicily; eventually returning to England via Naples and Malta in 1843.

On his return Bridges became rector of Maisemore near Gloucester and his son attended Maisemore School. Talbot's half-sister Caroline and her husband Lord Valletort, the Third Earl of Mount Edgcumbe (1797–1861) had a son, William Henry (1832–1917), who attended Maisemore School and became a great friend of Bridges' son, William. It was at Maisemore that Bridges first saw a copy of *The Pencil of Nature.* It was through the Mount-Edgcumbe family Bridges became known to Talbot.

Keen to take up the new art of photography and to travel to the East, Bridges sought advice in the new art of photography from Talbot, who arranged for his assistant Henneman to give him basic instruction as well as providing him with the prepared paper on which he would make his first calotypes. Talbot hoped for a return on his investment and Bridges agreed to send back his studies to be printed at his Reading printing works.

In January 1846 Bridges left Britain on his seven-year photographic odyssey, stopping in Paris where he had a camera made for him by the optician Charles Chevalier (1804-1859). Chevalier had already made an instrument for Calvert Richard Jones, who Bridges was to shortly to meet and take instruction from in Malta. While in Paris Bridges met the American merchant, poet and traveler Richard K Haight who was also having a camera made before traveling to England. Bridges, attracted by the American's plans for using the calotype in the United

States, wrote to Talbot to introduce his new friend and suggest the two should meet in England.

Bridges arrived in Malta on the 2nd March 1846 armed with his new camera. He met up with Calvert Jones, who had been asked by Talbot to help Bridges, and Talbot's wealthy Welsh cousin Christopher Rice Mansel Talbot (1803–1890) who were on a yachting tour of the Mediterranean.

Bridges wrote to Talbot from Malta on March 30th 1846 telling of the death of Kit Talbot's wife, Lady Charlotte Butler, and also sends condolences to Talbot on the loss of his mother, Lady Elizabeth Feilding. A further letter, in April 1846, tells of Bridges' first success, producing negatives of the local landscape, often including figures in his compositions. In his letters Bridges asks for any further technical advice Talbot can offer as well as constantly requesting further prepared paper. He often laments on the quality of the paper he receives, complaining that many iodized sheets are "specky."

Bridges left Malta for Sicily in mid 1846 where he made many studies, including the Benedictine Convent at Catania (where he stayed) and Etna. Generally he made two exposures of each subject, one example of which was returned to Talbot's "Reading Establishment" where Talbot's business agent and land agent, Benjamin Cowderoy (1812–1904), arranged for them to be printed. Bridges generally signed and titled his negatives in ink and copies were returned to the photographer at Malta for display and possible sale there, although it appears that Bridges' work met with little commercial interest both at home and abroad.

In October 1846 Bridges sent at least 73 negatives of Sicily to Talbot and in a covering letter mentions photographing an erupting Mount Etna, exposing the negative for three and a half minutes. Other exposure times mentioned were as long as seven minutes. As well as negatives Bridges often sent seeds taken from native plants to Talbot, who was a keen botanist.

During his photographic travels Bridges also visited Greece, where he made many studies of the Acropolis, Constantinople, The Holy Land and Egypt. By November 1850 Bridges had arrived in Jerusalem and by January 1851 he was in Egypt on the final leg of his seven year journey.

He returned to Gloucestershire in 1852 where he was appointed private secretary to the Bishop of Gloucester and Bristol, James Henry Monk (1784–1856), who was a former tutor of Talbot at Cambridge University. Bridges later became Vicar of Beachley near Chepstow, where he received a stipend of £40 per annum.

Bridges attempted to publish selections of some of the 1,700 photographic studies that he had struggled to make over the previous seven years. A Cheltenham print-seller named Alder had a selection of his views for sale, however Bridges complained that the studies of Syria and Egypt were ignored, although the "more picturesque Athens, Pompeii, Sicily and Naples sell." Bridge's pictures never really appealed to the public; people were wary of buying photographs and his views of parched landscapes weren't to all tastes.

Bridges had a selection of his work published locally: *Selections from seventeen hundred genuine photographs: Views-Portraits-Statuary-Antiquities taken around the shores of the Mediterranean between the years 1846–1852, with or without notes, historical and descriptive by a Wayworn Wanderer.* Mary Hadley, Cheltenham (containing 12 calotypes). This, along with a two-part supplement showing a total of 65 studies of The Acropolis, is listed by Gernsheim (Incunabula nos. 11–13).

There was a proposed series depicting views of Palestine, due to be published in 20 monthly parts, with four prints in each, by the Hogarth Press, beginning in December 1858, but was probably uncompleted.

On the death of his estranged wife in 1862 Bridges had a booklet privately printed in which he tried to explain the breakdown of his marriage: *Outlines and Notes of Twenty-Nine Years* is a sorry tale of life without his wife from 1834. Bridges himself died in 1863 and his remains were placed with those of his wife beneath a rock inscribed with an epitaph remembering their daughters, in the churchyard at Beachley.

IAN SUMNER

Biography

George Wilson Bridges was an English clergyman, author, traveller and early photographer. Married Elizabeth Raby Brooks, they had six daughters (two died in infancy, four drowned Jan 1st 1837) and two sons. Lived in Jamaica and Canada and produced 1,700 calotype negatives during seven years' travels (1846–52) in the Mediterranean and Middle East.

See Also: Talbot, William Henry Fox.

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BRIGMAN, ANNE (1869–1950)

American author, photographer, and studio owner

Anne Brigman was born Anne Wardrope Nott on December 3, 1869 in Honolulu, Hawaii to Samuel and Mary Ellen Nott. She moved with her family to Northern California as a teenager, and was married in 1894 to Martin Brigman, a sea captain. She took up photography in 1901 and began working in the Pictorialist style. She became an associate member of the Photo-Secession in 1903 and was elected a fellow of the group in 1906. After separating from her husband in 1910, she spent eight months in New York City where she participated in Clarence H. White's first summer photography class. She took many of her photographs during yearly camping trips to the Sierra Nevada mountains of Northern California between 1904 and 1927, and would later rework and print the negatives in her studio.

She is best known for her photographs of nude women in the landscape, such as "The Soul of the Blasted Pine" (1908) and "The Bubble" (1910). In 1929, she moved to Southern California and began producing abstract studies of landscape. In 1949, she published a book of her poems and photographs entitled *Songs of a Pagan*. She died on February 18, 1950 in Southern California.

Andrea Korda

THE BRITANNIA WORKS COMPANY

British materials manufacturer, established 1879

The Britannia Works Company, which later became Ilford Limited, grew out of the decision by Alfred Hugh Harman (1841–1913) to turn his back on a successful photographic service business—he was one of the first to offer printing and enlarging services to professional studio photographers—and devote his energies instead to the manufacture of dry plates.

In 1879, he moved from Peckham, London, to Ilford, Essex—because of the clean and dust-free atmosphere there—and established his new business in a converted house. With a five employees, Britannia Works—as the operation became known—produced all its plates by hand, eschewing early coating machines and instead opting for hand-poured emulsion from large teapots!

The first successful formulation for the gelatin dry plate had been published in 1871 by Richard Leach Maddox, and subsequently improved and refined by others, significantly Frederick Wratten, John Mawson, Joseph Swan and Hermann Vogel.

By 1879 several companies in Britain were making dry plates, most significantly Wratten & Wainwright, Mawson & Swan and the Liverpool Dry Plate Company. Undaunted by established competition, Harman quickly built up a successful business, mixing the emulsion himself to ensure the secrecy of his formula. Initially supplying his products direct to professional photographers, within little more than a year, Harman had appointed Marion & Company as his exclusive agents for the distribution of his "Britannia Dry Plates." Marion subsequently registered "Britannia" as a brand name, the ownership of which later became a source of contention when Harman fell out with them in 1885.

Harman was determined that only the highest quality plates left his works, and consistent quality control with early coating machines was not guaranteed. Coating plates individually by hand may have been labour-intensive but, followed by individual inspection, the required quality was assured. Using the large teapot for delivering the liquid emulsion because a teapot spout pours from the bottom, he ensured that a bubble-free emulsion reached the plate. Any froth floated on the surface of the liquid in the pot and stayed there. As was normal practice at the time, whole plate or oversize whole plate sheets of glass were coated, and once dried were cut down to half or quarter plate. Until 1894, cutting was also done by hand. Harman's original team of six—two men, three boys and himself—could produce several thousand plates per day with these primitive techniques.

The success of the "Britannia" dry plate was rapid and considerable, and in little over a year he had outgrown his original property and bought a nearby cottage where coating could take place. Further premises were added until, in 1883 a factory was built on the site of one of his houses, and the entire production process moved under one roof.

Two years later, after the rift with Marion & Company and an acrimonious court case in which he eventually lost the right to the "Britannia" title, the company was renamed the "Britannia Works Company," and the plate renamed the "Ilford Dry Plate." The introduction of a new logo on all plate boxes—a paddle-steamer with an "Ilford" flag streaming from its forward mast—provided a new identity for the company and its products. Competitive price-cutting—reducing the cost of a box of one dozen quarter plates from two shillings to one shilling—gave photographers a powerful incentive to try the newly branded plates.

Marions continued to market "Britannia" plates, but from 1887 their formulation was changed, and they were manufactured at Marion's new factory in Southgate.

From 1879 the Britannia Works Company produced only one type of plate until a second "Rapid" plate, only slightly more sensitive than the "Ordinary," was added in 1886.

1888 saw the introduction of two new emulsions, "Ilford Red Label" at twice the sensitivity of the ordinary

plate, and the similarly speeded "Ilford Isochromatic Instantaneous" plates. The isochromatic plate, dye sensitised with erythrosin extended sensitivity into the green and yellow bands of the spectrum, giving Harman his first orthchromatic emulsion.

Since 1884, before the split with Marion, he had also been developing a range of printing materials, and by 1889 had a range of bromide emulsions available on paper, opalescent glass and lantern slides.

With the company well established, and with a growing business, Harman set about expanding his workforce. In 1889 he appointed Andrew Agnew to supervise quality control, and John Howson as his first business manager. Howson was responsible for raising the company's profile through advertising and through publications such as *Photographic Scraps*, a magazine offering tips to photographers and promoting Ilford plates, which appeared within a year of his appointment. His most enduring contribution was *The Ilford Manual of Photography* which first appeared in 1891 under the editorship of Charles Herbert Bothamley, ran to many editions, and became the standard primer for generations of photographers and photographic students. Over 300,000 copies had been sold by 1920, and its successor, *The Manual of Photography* remains in print to this day.

By 1891, the Britannia Works Company claimed to be the largest manufacturer of photographic plates in the world, and in that year it became a limited company, with an innovative structure which extended the possibility of share ownership to Harman's employees. The share capital in the new company was £120,000, and of the 24,000 ordinary shares however, employees acquired only 46, while Harman held 23,540!

The acquisition of a smaller manufacturer in 1895 expanded the company's product range to include sheet film, and over the next two years, Harman's chemists experimented with cellulose rollfilms. In 1897, he rejected a proposal from George Eastman that their two companies should merge their interests, and Eastman went on to establish a manufacturing facility in London. In the following year, with profits rising rapidly, Harman converted his company from a private to a public limited company under the name of "The Britannia Works Company (1898) Limited."

Shortly thereafter, Frank Forster Renwick (1877–1943)—who as Scientific Director of Ilford Limited would later pioneer multigrade printing papers—joined the company.

One further company name change, in 1901, established "Ilford Limited."

JOHN HANNAVY

See Also: Maddox, Richard Leach; Wratten, Frederick; Swan, Joseph; and Vogel, Hermann.

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BRITISH JOURNAL OF PHOTOGRAPHY, THE

First published in Liverpool, *The British Journal of Photography* began as the *Liverpool Photographic Journal* on 14 January 1854 and continued through to December 1856 (vols 1–3). It continued as the *Liverpool & Manchester Photographic Journal* from January 1857 to December 1858 (vols 4–5). Following this it continued as the *Photographic Journal* from January to December 1859 (vol 6) and then as *The British Journal of Photography* from January 1860 (vol 7) to the present. Initially a monthly journal belonging to the Liverpool Photographic Society, it was sold during 1856 to Henry Greenwood, the printer and publisher since inception. The firm moved from Liverpool to London in 1864 remaining as the journal's publishers. From 1 January 1857 the *Journal* became a fortnightly and from 1 January 1865 a weekly publication. At the same time, the earlier size of large 8vo also changed to 4to.

The Liverpool Photographic Society and later the Liverpool Amateur Photographic Society included amongst its membership; Francis Frith, then a printer; George Berry, a professional photographer; Henry Greenwood, a printer; as well as B.J.Sayce, W.B.Bolton, Peter Mawdsley and later Vero C. Driffield. It was a suggestion made by George Berry that led to the publication of the Journal. The first editors were members of the Liverpool Photographic Society; Charles Corey, Frank Howard and George Berry. For a short period it was edited by William Crookes, and from June 1857 to February 1858 by T. A. Malone, one-time assistant to William Henry Fox Talbot. With the March issue of 1858 it came under the editorship of George Shadbolt, and from January 1865 William Crookes and George Dawson edited it for a few months until J. Trail Taylor took over in the same year. Taylor remained editor until 1879 when he left for New York to take over the *Photographic Times*. W. B. Bolton held the reins until 1886 when Taylor returned to his previous post, remaining editor until shortly before his death in 1895.

The British Journal of Photography was far more informative than its contemporary, *The Photographic Journal* published monthly by the Photographic Society of London. The scope of contributions and contributors were both national and international and was admired wherever English was spoken. This was due in part to the magazine's separate Colonial and Overseas edition;

a quarterly containing all the best articles featured in the *Journal*. With the increased popularity of lantern slide lectures, from October 1892 onwards the *Journal* publishe d a monthly supplement *The Lantern Record*, which added considerably to the already substantial bulk of information.

During the able editorships of Taylor and Bolton the *Journal* grew in importance and pages. A volume in the 1880s and 1890s typically contained over 800 quarto pages and these pages were frequently used to announce the progress of photography. The important developments in the gelatine dry plate as well as other processes were first published in its pages. Since 1860 *The British Journal of Photography* has retained the enviable position of being one of the most influential photographic journals in the world.

MICHAEL HALLETT

BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, THE

The British Journal Photographic Almanac is the oldest photographic yearbook in the world and was first published as a wall calendar for the year 1860, and given away as a supplement to the 15 December 1859 issue of *The British Journal of Photography*. It was issued free of charge to subscribers of the *Journal* and could be bought by non-subscibers for 3d. The *Almanac* for 1861 was a small pocket-book, 16mo (4 × 2 ½ inch) size, containing in addition to the calendar a miscellany of photographic information including meetings of societies, formulae and tables. With a subtitle *Photographer's Daily Companion*, it was edited by Samuel Highley. The 1886 issue was produced in Crown 8vo format, 4½ × 7 in., and sold as a separate publication with 118 pages of text and 44 of advertising, priced 6d.

The editorial chair most frequently mirrored that held by the *Journal*. Highley was editor for 1861 and 1862. He was succeeded by James Martin in 1863 and by Emerson J. Reynolds in 1864. J. Trail Taylor was editor between 1865 and 1879 and again between 1887 and 1896, while W. B. Bolton was editor in the in-between period of 1880 and 1886. Thomas Bedding was in the chair from 1897 to 1905.

Introductory remarks made by Taylor in the 1871 edition of the Almanac typifies the attitudes of the period. "… the first feeling is that something has been done, although not very much; but this is almost immediately followed by the rather ludicrous thought that almost ever since photography was practically introduced the same has been said year after year. And, looking back from this point of view, at the close of 1870 we were rather gratified to discover that in no previous year had any startling discovery been made, no great advances been effected." Articles in the *Almanac* reflect the progress of the period and demonstrate the high regard with which the publication was held and still is held as a point of reference. They includes M. Carey Lea on the development of the chlorobromide process, modifications of the collodio-bromide process by Bolton and Sayce and Walter Woodbury's perfected system of photo-engraving.

By 1891 Taylor had returned to England and was again in the editorial chair. The *Almanac* had 1,144 pages of which 327 were editorial and boasted a frontispiece of "Conway Castle," "an example of an average print on bromide paper." Alfred Watkins considers the "Standards for factors affecting exposures" while F.T. Bennett offers a specialist formula for "Portraiture and hydroquinone." There is "Hints for Retouchers," a discussion about "Artistic Landscape Photography" and a tale of "A trip of 25,000 miles with the Camera." Additionally there is an eclectic collection of short articles that make up the 'epitome of progress' with 'notes of passing events, original and selected. In this particular year it includes 'copying glass positives,' 'pin-hole photography' and more reference to the 'composition of pictures.' A continuing list of patents, formulary, tables and equations complete this increasingly essential compendium of reference in the nineteenth century.

MICHAEL HALLETT

See Also: Lea, Matthew Carey; Sayce, B. J.; and Woodbury, Walter Bentley.

Further Reading

(various editors), *The British Journal Photographic Almanac*, annually from 1860 onwards.

BRITISH LIBRARY

The British Library was formed in 1973, bringing together the collections of the British Museum Library, the National Central Library, and the National Lending Library for Science and Technology. The British Museum Library, established in 1753 as the Museum's Department of Printed Books, itself amalgamated several significant collections. Formed from the library and natural history collection of Sir Hans Sloane, the manuscript collection of Robert and Edward Harley, the first and second Earls of Oxford, and Sir Robert Cotton's collection of manuscripts and antiquities, the British Museum Library specialized in printed books, manuscripts, and papers of historic and scientific importance.

The public announcement of Louis Jacques Mandé Daguerre's and William Henry Fox Talbot's photographic

processes in 1839 did not have an immediate impact at the British Museum. Although individual Museum Trustees and staff became interested in photography over the course of the 1840s, photography was not embraced at an institutional level as quickly as it was, for example, at the South Kensington Museum. The first demonstration of photography at the Museum was undertaken by Talbot, inventor of the calotype process. In the summer of 1843, when Charles Fellows considered using the calotype process on an archaeological expedition, Talbot was invited to the museum to conduct experiments. However, because of the difficulty in producing good results, the process was deemed unsuitable for the harsh conditions of the journey.

It was the 1850s when the British Museum became significantly involved in photography. By the early part of the decade, the Museum had received donations of photography, including books illustrated with calotypes, and Museum officials had received requests from photographers seeking to take pictures of objects in the collection. Museum Trustees gave serious consideration to the reproductive possibilities of photography in 1852, and they agreed that photographs would be useful for scholars interested in deciphering the cuneiform inscriptions on tablets in the Museum's collection. In 1853, Edward Hawkins, Keeper of Antiquities, pressed Museum Trustees and Principal Librarian, Henry Ellis, to support the in-house production of photographs. Plans to build a photographic studio on the roof of the Museum were discussed, and equipment and cost estimates were solicited from two photographers, Roger Fenton and Philip Henry Delamotte. On the recommendation of Sir Charles Wheatstone, inventor of the stereoscopic camera, Fenton was given a temporary appointment as museum photographer in the fall of 1853. The Trustees gave Fenton permission to purchase equipment, and they asked him to produce a trial series of photographs. The first results of Fenton's work, produced in early 1854 using the wet collodion process, were photographs of recent acquisitions of antiquities and Assyrian tablets from the collection.

Fenton's relationship with the Museum was productive and, from his point of view, profitable, but it was not without interruptions and disputes. The Trustees approved further expenditures on photography after the initial trial, however Fenton's excursion to the Crimea in the summer of 1855, and his subsequent illness, meant that he was absent from the Museum until 1856. Upon his return, Fenton earnestly resumed producing photographs of items in the collection. One significant undertaking was the reproduction of the Clementine Epistles in an early Christian manuscript, the *Codex Alexandrinus*, for divinity professors at Oxford and Cambridge. The professors proposed that reproductions of the epistles should be published because they had been omitted from recent editions of the codex. With Fenton's expertise, fifty copies were produced for sale by a London dealer. Despite the scholarly value of photographic reproductions, mounting costs from photography and failed attempts to recoup expenses through the sale of prints signaled the commercial failure of photographic operations at the Museum. Ultimately, the Trustees decided that photography was too costly, and they suspended Fenton's work in 1858.

Another figure who had a significant impact on photography at the Museum was Anthony Panizzi. As Keeper of Printed Books, he suggested new applications for photography. He proposed that photographs could replace missing plates and pages in incomplete copies of books and that photographs of pages from selected rare books could be consulted by researchers. Upon his appointment to Principal Librarian in 1856, Panizzi became increasingly involved in photographic work. Enthusiastic about photography's potential as a reproductive tool, Panizzi was nonetheless challenged by the administrative task that the photographic operations presented. In response to the Trustees' concerns about high costs, Panizzi began to monitor all photography requests. When Trustees decided to terminate the arrangement with Fenton in 1859, Panizzi organized the transfer of photographic reproductions to the Department of Science and Art at the South Kensington Museum. The agreement only lasted from 1860 to 1863, but it caused Fenton's association with the Museum to end bitterly.

In subsequent years, the Principal Librarian continued to administer arrangements with the many photographers requesting to photograph objects in the collection. While photography continued to serve primarily as a means of reproducing objects in the Museum's collection, photographic reproductions of carefully selected documents were purchased in an effort to build comprehensive collections in various British Museum departments. One instance of this was the purchase of a photographic copy of a sixteenth-century French *mappemonde*. Throughout the 1890s, a high demand for photographic work meant that library staff spent a great deal of time supervising photographers. Richard Garnett, Keeper of Printed Books at the time, recommended establishing a photography department to handle the work; however, it was not until 1927 that a new museum photographer was hired.

Today, the British Library has an impressive collection of photographs and photography-related materials. Among the Library's holdings of nineteenth-century texts are significant works in the history of photography. Notable examples include Daguerre's *Historique et description des procédés du daguerreotype* (1839), Talbot's *The Pencil of Nature* (1844), Eadweard Muybridge's eleven-volume *Animal Locomotion* (1887), and

a presentation copy of the official catalogue of the Great Exhibition of 1851, illustrated with over one hundred and fifty calotypes. The Library's collection of nineteenth-century photographs is particularly rich in work from the Indian sub-continent and Egypt. Highlights include hand-colored photographs from the early 1850s, taken in Calcutta, Madras, and Ceylon by Frederick Fiebig; photographs of monuments, architecture, and sculpture, produced for the Archaeological Survey of India between the 1850s and 1920; and photographs of the monuments of Egypt by Maxime du Camp, Felix Teynard, and Francis Frith. Public access to the British Library's collection of nineteenth-century photographic material improved with the conservation and electronic cataloguing projects of the 1990s.

SARAH BASSNETT

See Also: Talbot, William Henry Fox; Fenton, Roger; Wheatstone, Charles; South Kensington Museum; and Wet Collodion Positive Processes.

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BROGI, GIACOMO (1822–1881), CARLO (1850–1925) AND ALFREDO (d. 1925)

Italian photographers

A novice in Achille Paris's studio, a calligrapher in Florence, and then a retoucher of chalcography in Luigi Bardi's, Giacomo Brogi became a photographer in 1856. He established his studio in 1860 under the name "Giacomo Brogi Fotografo" (1 via Tornabuoni) and took part in the international exhibition in Florence the following year.

In 1862, he organised a photographic campaign in the Holy Land (where he will return in 1868) and publish a sixty views in his *Album of Palestine.* He began to photograph works of art and edited his first catalogue *Dei Soggetti artistici* in 1863. In 1865, he transferred his portrait and reproduction studio to 15 Lungarno alle Grazie and opened a shop at 79 Corso dei Tintori. He showed his work in several exhibitions (Forli 1871, Vienna Universal Exhibition 1873) and offered his Palestine Album to Victor Emmanuel and to Umberto I, who nominated him "Photographer of the Emperor." Brogi developed a chain of shops in the tourist cities of Italy, first in Rome at 419 via del Corso, then Naples in 1879, at 61–62 piazza dei Martiri and later in Sienna in 1909 at 6 via Cavour.

In all likelihood, Giacomo published his first catalogue entitled *Firenze e Toscana catalogo* in 1878. He sold his print collections in France and Europe in 1880 thanks to Adolphe Giraudon, who was established at Bonaparte Street in Paris, in front of the Art School.

In 1879 and 1880, he created the first photographic campaign of Pompeii. The next year, he exhibited these photographs with his son Carlo in Milan. He won a silver medal and received the first prize of landscape and architecture Photography in Melbourne. Soon after achieving those accomplishments, Giacomo died.

Giacomo's son Carlo (1850–1925), helped by his brother Alfredo (?–1925) managed the firm. Together they specialised in painting reproductions, and published in 1893–1894 a new three volume catalogue filled with photographs of frescoes, mosaics and drawings of the great masters from the royal galleries of the Offices of Pitti Palace and the Ambrosian Library. They also developed new photographic campaigns in Naples and Pompeii, but kept the same catalogue numbers, which makes dating the prints difficult. Two other catalogues were published on this subject in 1895 and in 1902, entitled *Supplément au catalogue spécial des photographies de Naples et environs publiées par la maison Brogi: peintures, vues, sculptures, etc…*

Concerned by copyright and reproduction rights, Carlo took an active part in the Photographic Italian Society, of which he became vice-president. In 1885 he published two brochures entitled *Sulla proprieta delle Fotografie* in Florence and *In proposito della protezione legale delle fotografie* in Rome, discussed with colleagues an international approach. He was one of the first to establish the interdiction of reproduction without authorisation by inscribing on negatives the two letters "R.I." ("Riproduzione Interdita"). Carlo displayed his images in 1886 in Florence, and organised the first photographic exhibition there in 1887.

In 1889, Carlo Brogi published a catalogue of 308 pages in several languages entitled *Catalogo delle Fotografie artistiche dallo stabilimento Giacomo Brogi,* listing the prints he had available. This catalogue was

be republished and completed by supplements in 1899, 1903, 1907 and 1912.

Brogi travelled to and participated in, with his colleagues Alinari and Anderson, the Berlin International Exhibition of Amateur Photographs in September 1896. There he showed panoramas of Florence, paintings and sculptures of the Uffici Museum. With the intention of satisfying the new tourist bourgeois and following the market tendency, Carlo published in 1898 a special catalogue of stereoscopic views of paintings, sceneries and sculptures. Less expensive and smaller in dimension, those images of popular entertainment were more attractive for the larger public, and in 1900 at the Universal Exhibition in Paris, Carlo received a gold medal for this work.

During this time, Carlo kept publishing photographs separately and in albums on specific subjects and in exhibitions. In 1904, the drawings of civil and military Italian architects from the 15th to 18th centuries from the Offices museum were displayed in a fourteen page catalogue with one hundred and twenty six illustrations. That year at the exhibition in Florence, he documented the antics and works of art from Sienna. In 1909, he reproduced the museum of Sienna and in 1911 an exhibition of portraits. From 1911 to 1919, Carlo edited a monthly bulletin that covered the publications of his firm's "Giacomo Brogi, Fotografo-editore," as the Braun company did in the 1930's. This self-advertisement provided an effective method to communicate to the public and his clients.

Carlo died on April 25, 1925, a few weeks after his bother Alfredo. Their sister Eugenia took over as the manager with her husband Laurati who died in 1926. In the 1940, their son Giorgio and his operator Gino Malenotti, very appreciated for his sculpture reproductions, gave a new impetus to the firm. Subjected to the competition with Alinari, to the 1944 bombardment and to the Arno flood 1966, which destroyed a part of the archives, the prosperity of the firm collapsed.

Almost 50,000 negatives were given up to Earl Vittorio Cini, who also bought both Alinari and Anderson in 1963, which placed the three most prestigious collections into one. A hundred of prints of various techniques from the Brogi production of the end of the 19th century and from the Giorgio Laurati settlement were added to this collection in 1988. Brogi's archives are kept in the Alinari Museum in Florence. One can also find a large number of his photographs all over Europe and the United States in 19th century tourists albums, libraries photographic collections, artists' private collections, Gustave Moreau and Rodin for instance, and in University collections. These images remain an important source of documentation of Italian art and architecture from antiquity to the modern age.

LAURE BOYER

See Also: Fratelli Alinari.

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BROMIDE PRINT

Silver-based photographic materials depend on a compound of silver nitrate and a halogen such as chlorine, iodine, and/ or bromine. This produces a chemical reaction, apparent as a darkening of the sensitised area in the presence of actinic light. Silver bromide paper uses the most sensitive of these halogens, and was derived from Richard Leach Maddox's formula for dry plate negatives; silver nitrate and cadmium bromide in a gelatin binder, exposed for a latent image and amplified through chemical development. In 1874, gelatin silver bromide paper was advertised by Peter Mawdsley's Liverpool Dry Plate Company, but the paper was not successful. In 1879, Joseph Wilson Swan patented and initiated the manufacture of 'bromide printing paper,' as did E. Lamy in France. Improvements in coating technology were introduced by Eastman and Company in Rochester in 1884, and gelatin bromide paper was perfected over the following twenty years. By the 1920s, it had become the standard paper for black-and-white photographs, modified in the 1970s as a mixed emulsion variable contrast paper, combined with silver chloride.

Pure silver bromide paper had commercial and industrial applications, but was initially too finicky for amateurs: its sensitivity required a safelight for the darkroom, and it printed so rapidly that the correct exposure was difficult to judge. Photographers were accustomed to daylight contact printing-out paper; developed-out paper produced only a latent image and so could not be printed by inspection. Although the timing was crucial, mechanical timers were rudimentary. Furthermore, each manufacturer made paper of a different sensitivity, so that exposure times varied and had to be determined through trial and error. For these reasons, the first commercial bromide paper was effectively contact-speed. It was used for enlarging from the early 1890s, once photosensitivity could be gauged and timers improved.

While many art photographers wished for prints with a plain or laid surface like that of drawing or watercolour paper, this was hard to achieve with contact papers, which needed a relatively smooth finish to provide a good contact with the glass plate negative and a reasonable resolution in the positive print. A bumpy surface would scatter the light, soften outlines and break up detail. Projection-speed papers addressed the problem, as they did not need a smooth surface for contact printing, and this encouraged the production of rough or textured papers. Although a number of companies introduced rough papers in the 1890s, they were not widely available, as the demand was limited. Rough papers were hardly suitable for small format portraits, and these made up the bulk of the photographic market.

Until the early 1890s, matt silver papers had only a thin gelatin silver emulsion and often omitted the baryta (barium sulphate in a gelatin binder) subbing layer. Baryta, once adopted for bromide papers, could be embossed for a textured surface. 'Platino' bromide papers used added starch flour for a matt finish. Bromide papers did not adopt the pastel pink, blue, and purple bases of silver chloride printing-out papers, as these clashed with the neutral image colour; instead, the baryta subbing layer was tinted cream or ivory.

Bromide developing-out paper tends to a grey-black image colour, because developed-out silver is deposited as a tangle of filamentary silver whose light absorbing properties gives the appearance of a neutral image. From 1892, Eastman produced an 'Extra-Rapid Bromide Paper' advertised as producing a range of hues from black to sepia. Sepia toning with sodium sulphide was not common practice until the early 1900s, but by 1890, uranium nitrate was used as a toner for brown hues on matt silver bromide paper. In the nineteenth century, the most common toner for bromide papers was platinum.

Although John Herschel's early work with platinum chloride had focused on its suitability for toning, this application was not perfected until the late 1880s, when Lyonel Clark adapted William Willis's cold-bath platinotype process for toning commercial gelatin silver and home-made salted papers. Valentine Blanchard introduced other formulas for a warm brown or black image colour, and represented 'Blanchard's Platino-Black Paper' with eleven prints at the 1890 exhibition of the Photographic Society of Great Britain. Others, including Alfred Stieglitz, announced similar methods, and Lyonel Clark published a book on the subject. Platinum toning of silver bromide was most common from about 1895 until the early 1920s. Platinum was sometimes combined with palladium, particularly for toning homemade silver chloride papers. Pure palladium was also used for toning, but the results were unreliable and not believed to be any better than the combined platinum-palladium or uranium toning.

In the 1890s, the escalating price of platinum encouraged cheaper substitutes, and 'platino' bromide papers were manufactured with a matt finish and cold-neutral image colour to mimic the visual characteristics of platinotypes. In 1891, the Fry Manufacturing Company introduced a 'Naturalistic' Bromide Paper on a rough-surfaced Whatman base, which the *Amateur Photographer* reported as readily producing "soft tones, almost equalling those of a platinum print."

Increasingly, manufacturers made this comparison explicit: in 1894, Eastman brought out 'Platino-Bromide' paper, and Wellington and Ward followed with 'Platino-Matt Bromide.' This advanced the acceptance of silver bromide paper for art photography and exhibition prints. But bromide prints were vulnerable to the residual sulphur compounds from the thiosulphate fixing bath, which led to yellowing and fading of the metallic silver image. Indeed, many 'platino-bromide' papers were intended to be toned with platinum, which substantially enhanced their stability and more nearly approximated the hue and tonal characteristics of platinotypes.

Silver bromide papers are susceptible to oxidative-reductive 'tarnishing' from acids (from handling or airborne contaminants) and staining and sulphiding from residual fixing chemicals. The gelatin binder may show damage from moisture, evident in spots of mould and in delamination from the paper base. These issues persist in modern gelatin bromide paper.

HOPE KINGSLEY

See Also: Blanchard, Valentine; Dry Plate Negatives: Gelatine; Dry Plate Negatives: Non-Gelatine, Including Dry Collodion; Enlarging and Reducing; Herschel, Sir John Frederick William; Maddox, Richard Leach; Photographic Exchange Club and Photographic Society Club, London; Platinotype Co. (Willis & Clements); Stieglitz, Alfred; and Willis, William.

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BROTHERHOOD OF THE LINKED RING

The Brotherhood of the Linked Ring was an elite international society founded in London in 1892 to promote photography as a fine art. The style of art photography then in vogue was known as pictorialism. The Brotherhood was the first group in England with a vision of art photography broadly shared with others in Europe and the USA. The Vienna Camera Club exhibitions started in 1891 and the salon of the Photo-Club de Paris was formed in 1894, both groups becoming affiliated to the Linked Ring by 1895. In the United States, art photographers in Boston, New York and Philadelphia invited foreign photographers to their sixth exhibition in 1893. Crucially, Alfred Stieglitz founded the Photo-Secessionists in New York in 1902. By then, many of his group were already in the Brotherhood.

Art photography in Britain, as elsewhere, tended towards domestic and conventional genre and landscape subjects, and scarcely recognised contemporary radical fine art movements such as Aestheticism and Symbolism. The determination to stay with gentler subjects eventually destroyed the Brotherhood in 1908-10, as it tried and failed to eradicate the influence of those Photo-Secessionsits who did engage with Aestheticism and Symbolism.

But those battles lay in the future. In the 1890s, before the Brotherhood existed, the growing interest in modern art photography in England had little support from the medium's oldest institution, the Photographic Society of London (founded in 1853 and named the Royal Photographic Society of Great Britain from 1894). Instead of actively supporting art photography, the Photographic Society had, for most of its existence, favoured science and technology, and resisted changes in its art photography salon.

The Brotherhood was formed as a result of a squabble among members of the Photographic Society over what pictures to include in the salon. The row took place in 1891 when The Hanging Committee rejected George Davison's "The Onion Field" (1889) on the grounds of late submission. But this was a nit-picking attempt to sidestep the real issue. The Hanging Committee rejected "The Onion Field" because it was a soft-focus, impressionistic pin-hole photograph made without a conventional camera and lens. The impressionism and the lack of technology clashed with the Committee's established ideas on art photography, which required beautifully composed scenes of known subjects and of recognisable artistic merit in the manner of eternal standards. In their view, Davison's work stood for transient and unskilled whimsy. Davison was a new type of artist—but the die-hards on the Hanging Committee were either uninterested in modern art photography or were determined to stop its progress in the Photographic Society.

The vice-president of the Society, Henry Peach Robinson, though not a member of the Hanging Committee, ensured that Davison's work was after all given pride of place. Someone then complained and officials removed the work, insisting that Robinson leave the gallery. Robinson and Davison resigned from the Society and, along with Ralph Robinson, William Willis, Alfred Horsley Hinton, Henry Herschel Hay Cameron and nine others, founded the Brotherhood of the Linked Ring.

The name was derived from the gimmal ring, a jointed finger-ring which could be worn by two people at the same time, linking hands. The Brotherhood was deliberately exclusive, and the circle could only increase when existing Links (as members were known) proposed and unanimously approved new names. The total number of different Links was 114, though the estimate for the greatest number in one year is 74 (in 1902). There were about 50 Links when the group disbanded in 1910.

Apart from membership by invitation, there were few rules in the Constitution. The Links were held together by their enthusiasm for pictorialism, which encouraged individual expression while expecting practitioners to be familiar with optics, chemistry and the mechanics of photography. Of course, there was never one single style of pictorialism and, increasingly, different approaches divided the fraternity. Though Robinson and Davison were founding members, their differences summarise the arguments that eventually wrecked the Brotherhood. Robinson was the greatest exponent of combination photography of a moralising or narrative kind, whereas Davison (despite his pin-hole experiment) preferred to compose naturalistic scenes in the viewfinder and print in photogravure. His opposition to storytelling and darkroom "faking" made him a natural ally of Alfred Stieglitz, who became a Link in 1894. The Links agreed that a photograph was not artistic if (in the words of Stieglitz) it was technically perfect but pictorially rotten. So although the Links became expert in techniques, the artistry lay in the evocation of mood rather than the statement of fact.

Despite the importance of the final effect, the Links engaged in often bitter disputes over processes. Some advocated print manipulation in the darkroom while others believed the photograph should be printed 'straight,' insisting on the purity and integrity of the chemical process. The opposing factions never resolved the matter in arguments stretching over twenty years and, from this distance, the differences between them are less striking than their similar aim: to make rare and unique prints. This they achieved either through various oil pigment processes which enabled them to make pictures look like lithographs or mezzotints, or through the use of platinum salts and gravure printing, produc-

ing images that were equally remote from everyday snapshots or printed illustrations.

In the 1890s, it was still possible to ignore artistic differences and enjoy the benefits of an exclusive club. The Brotherhood enjoyed the vague mysticism of rituals. The Links used quaint language and (in many cases) took pseudonyms. For example, after the debacle at the Photographic Society, Robinson became "High Executioner," denoting his responsibility for arranging the Brotherhood's annual Photographic Salon in London. This exhibition was the showcase for the best recent art photography from Britain, Europe and the United States of America, and took place in September from 1893–1909.

Whereas the row that led to the foundation of the Brotherhood was short and sharp, the row that ended it dragged on for almost two years from 1908. By then there was even less agreement about pictorialism than in the 1890s. Robinson died in 1901, but his preference for combination prints with a strong narrative continued, notably in the work of Francis James Mortimer. Although a newcomer to the Ring in May 1908, Mortimer was to be as influential in its demise as Robinson had been in its foundation. Mortimer became Centre Link in October that year. The structure of the Brotherhood was designed to keep power in the hands of the Centre Link (elected monthly) and his allies, who tended to be British. This was a strength as long as the Brotherhood was united but was inadequate in the crisis of 1908–10, when the various Centre Links represented divided camps within the Brotherhood, and decisions about the future of the Brotherhood swayed first one way and then the other.

The fundamental disagreement occurred when members or supporters of Stieglitz's Photo-Secession appeared to have taken over the Photographic Salon of 1908, leaving no room for British pictorialists. Many American pictorialists, such as Rudolf Eickemeyer and Fred Holland Day, exhibited at the Salon. However, from 1899 to 1906 the main American representatives were those who (in 1902) became members of the Photo-Secession, including founding members such as Frank Eugene, Gertrude Käsebier, Joseph Keiley, Edward Steichen and Clarence White. After a lull in 1907, when the Salon included only one minor Photo-Secessionist, in 1908 the so-called "American Committee" controversially swamped the Salon with work by innovative Photo-Secessionists and their supporters. When some British Links attempted to regain control of the Salon, they forced others to declare their allegiance either to the Brotherhood or the Photo-Secession. The unexpected result, eventually, was the unlinking of the Ring in 1910.

In the controversial Salon of 1908, fewer than half the 203 exhibits were by Photo-Secessionists. Annie Brigman, S. R. Carter, Alvin Langdon Coburn , Fanny Coburn, Eugene, Keiley, Steichen, White, Stieglitz and White (who collaborated on six images) and Eva Watson-Schütze showed a total of 95 pictures between them. Further, only Coburn, Steichen and Keiley were actually in London during the selection process, though White, Eugene and Stieglitz were supposed to have taken part in the selection earlier on. However, other members of the Committee, including James Craig Annan, Robert Demachy, and the Baron Adolph de Meyer were supporters of Stieglitz, and between them had 58 works on show. Two other selectors, Davison and Heinrich Kühn, supported Stieglitz but did not exhibit their own work. In all, the selection committee awarded themselves three-quarters of the exhibition space. Another 15 Links showed only 29 pictures between them, which left 21 places for outsiders.

But the supposed American take-over of the Salon provoked a crisis in the Ring. Francis Mortimer quickly organized a Salon des Refusés of rejected photographs in the offices of *The Amateur Photographer* which he edited from 1908. More importantly, he printed the work of the rejected Links in the magazine. Most of the photographers included in the Salon des Refusés played a part in Edwardian photography but few of them are now included in histories. They successfully reflect the certainties of Edwardian Britain, especially the comfortable life of the English upper middle-classes. Appreciative critics described the work as "decorative" or "tasteful." In the preface to the list of exhibits Mortimer claimed that the "progress of art" would be advanced by the "expression of nature and beauty" rather than by seeking "ephemeral notoriety" in "temporary art crazes."

Despite Mortimer's leadership against Photo-Secessionist influence, many Links favoured it, and others supported them. The editor of *Photography and Focus*, R. Child Bayley, thought that the 1908 Salon might be "eccentric" and "puzzling," but at last the Photographic Salon had lost its "heavy respectability." Now it would "shock and startle many" and was "all the better for it" (*Photography and Focus,* 15 September 1908).

The American work was Symbolist whereas the English was just anecdotal (compare Steichen's "Globe" series with Alexander Keighley's "A Word in Passing"). The work was urban where the English was rural (compare Coburn's "Flip-Flap" with John Dudley Johnston's "Snow on the Hillside"). It was erotic where the English was cosy (compare Eugene's sexually-charged portraits with Will Cadby's "Baby Study"). It dealt with the hurly-burly of life whereas the English was full of peace and quiet (compare Stieglitz's "At the Steeplechase" with Mrs G.A. Barton's "Morning").

Some writers, such as the critic A.J. Anderson, did not approve of current British pictorial photography but they thought that the American invasion was dangerous. The British and European Links must act quickly to prevent the Salon from collapsing or becoming "annexed" by the Photo-Secession.

The Links acted and, led by Mortimer, they managed to defeat Davison over arrangements for the Salon of 1909. Davison had wanted rigorous selection, excluding all but the best pictorialists, which would have meant the return of the Photo-Secessionists. But led by Mortimer, the Links voted to invite individuals only. The Photo-Secessionists could no longer exhibit as a group, and so they all resigned in May. Their mass resignation took place months before the Photographic Salon of September 1909, but it led to further in-fighting among the Links and the Brotherhood collapsed in 1910.

Some former Links decided to continue their version of pictorialism and founded the London Salon in 1910. Pictorialism flourished there though it remained more or less where it had been in 1909. The Links who believed that everything British was correct were in the ascendance. Ignoring evidence to the contrary and changes abroad, they reasserted the Victorian belief in moral and improving art in gentle, picturesque photographs. Their victory marked the path of art photography in Britain for years to come. Significantly, the Brotherhood of the Linked Ring, in all its vicissitudes, represents the exclusive and conservative attitudes that help to define the artistic cultural life of Britain in the late Victorian and Edwardian epoch.

JOHN TAYLOR

See Also: Day, Fred Holland; Photo-Club de Paris; and Stieglitz, Alfred.

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BROTHERS, ALFRED (1826–1912)

English studio owner and photographer

Alfred Brothers operated a studio at No14 St Ann's Square in Manchester from 1858 until at least 1894. He took over premises which had formerly been operated by Beard & Foard since 1854.

He was born in Sheerness, Kent, England on January 2nd 1826, and later apprenticed to a bookseller. After a period of employment as an insurance agent, during which time he took up photography, he opened his Manchester studio. In 1858 he suggested a method of silvery recovery from spent chemicals.

He had a lifelong interest in astronomy, and wrote and lectured on the subject from the mid 1860s.

Brothers became one of the leading figures in both the Manchester Literary & Philosophical Society—where he met Roscoe and others—and the Manchester Photographic Society. He therefore knew of Roscoe's experiments with magnesium wire as an illuminant. In 1864, using magnesium ribbon made by flattening Roscoe's wire, Brothers took the first portrait lit solely by magnesium light—of Roscoe—and in the same year took the first photographs underground, at the Blue John Mines in Derbyshire also using the ribbon.

His 1892 book *Photography, its History, Processes, Apparatus and Materials*, went to several editions, he published several albums of photographs, and was a frequent contributor to the photographic press.

JOHN HANNAVY

BROWN JR., ELIPHALET (1816–1886)

An early-American expeditionary photographer

Although Eliphalet Brown, Jr. is best remembered as the daguerreotypist with Commodore Matthew Perry's 1852 mission to open Japan to the West, he had an extensive career prior to that famous role.

He was born in Newburyport, Massachusetts in 1816, and by his early twenties was working as an artist in New York, among a growing number of young men producing the numerous drawings and lithographs required by a burgeoning publications industry seeking to satisfy the curiosities of a public eager for a more visual depiction of the world.

He spent the next thirteen years working for various establishments, including Currier and Ives, producing portraits and historical and marine lithographs, sometimes on his own, and occasionally in partnership with others. In 1841 he exhibited his work at the National Academy of Design in New York.

A younger brother, James Sydney Brown, had also come to New York to pursue a career as an artist. With Eliphalet's help, he began as a silversmith's apprentice, then opened his own portrait studio, but soon gave that up to become the first operator for the newly opened daguerreotype gallery of Matthew Brady. By 1846, James had left Brady to join Eliphalet Brown as a partner in their own business, but it is unclear if he was making daguerreotypes during this period. By 1848 James was working alone as a daguerreotypist at his American Gallery, and from 1851 to 1854 had moved back to his original portrait studio at 181 Broadway, but by then as a daguerreotypist.

It seems likely that Eliphalet had learned daguerreotype from James during their partnership together, but the puzzle is why Matthew Perry selected Eliphalet over James to be his official photographer for the expedition to Japan. Perhaps Perry was looking for a more broadly talented person with a little more maturity and experience. In 1853, after the expedition to Japan was underway, James had an exhibit at the New York Crystal Palace of a series of daguerreotype portraits of Perry and his officers, so he was known to Perry. He was also on friendly terms with Samuel Morse and Napoleon III, so he apparently travelled in influential circles, but while James specialty seems to have been daguerreotype, Eliphalet's expertise was in drawing and lithography, and since that was the primary means of reproduction at the time, those skills probably assumed a greater importance for Perry.

Eliphalet left his brother's partnership in 1848 and in 1851 joined with Charles Severyn, a lithographer, but by the time he was selected by Perry, he was again working for Currier and Ives. Apparently his drawing ability was as important as his photographic expertise, yet there is no official mention in the final government report of his dual role beyond an occasional reference to "the artists." The lithographs made for the government report listed twenty-five drawings in which Brown was listed as co-artist, almost always credited for drawing the figures, while the landscape or surroundings were credited to William Heine, a twenty-five year old German who was the official artist on the expedition.

The expedition got underway from Annapolis, Maryland on November 24, 1852, and sailed the southern route around Africa, making stops at Madeira, Capetown, Mauritius, Ceylon, Singapore and Shanghai before stopping in Naha, Okinawa, in the Ryuku Islands on May 26, 1853. Perry rented a house there and ordered Brown to commence making daguerreotypes.

On 2 July1853 Perry set sail for Japan with the black painted, four ship fleet.

Arriving 8 July, after 9 days of tense negotiations, the Japanese Government accepted Perry's letter from President Millard Fillmore, requesting a treaty of trade and supply with Japan. Promising to return in the spring of 1854 for the Japanese response, they returned to Hong Kong and Macao, where they set up headquarters till the return trip. Many of Eliphalet Brown, Jr.'s daguerreotypes produced during this extended stay show him working in a less formal way, with casually posed people portraying cultural details, as opposed to the later, more formal portraiture from Japan.

Returning to Japan on 14 January 1854, the Emperor's positive response was received, and treaty negotiations commenced on 9 March 1854. By 31 March 1854, a treaty had been signed giving the United States the right to use the ports of Shimoda to the south and Hakodate to the north. Perry then sailed to each port for evalution and diplomacy with the local officials, allowing Brown numerous opportunities to make many of the approximately four hundred daguerreotypes he reportedly made during the expedition. On 17 August 1854, they finally set sail again for Hong Kong and Shanghai.

After the return of the expedition to the U.S. in early 1855, a report of the expedition was published by the Congress of the United States on 1 January 1856, utilizing ninety lithographic illustrations, of which nineteen were derived from Brown's daguerreotypes.

It has been widely publicized that all of Eliphalet Brown, Jr.'s daguerreotypes were destroyed in an 11 April 1856 fire at the Peter S. Duval Lithographic Company of Philadelphia, Pennsylvania, but an examination of the official report reveals that they only made six of the nineteen daguerreotype-derived illustrations in the report, with the balance distributed among three other lithographic firms, one other in Philadelphia and the other two in New York. Although those six at the Duval firm may have been lost, by no means were all of them destroyed and, although the rest have not been accounted for, they may yet turn up in some obscure archive in Washington, D.C.

After his return from Japan, Brown seems to have given up both art and photography, instead spending the next twenty years in the U.S. Navy, as a Master and Ensign during the Civil War, and later in the Mediterranean as an Admiral's secretary. He retired from the Navy about 1875, married and seems to have lived quietly until his death on 24 January 1886.

Today, Eliphalet Brown, Jr.'s artwork can still be found in the Library of Congress, the New York Public Library and the Museum of the City of New York, all signed E. Brown, Jr. The only identified daguerreotypes

by him consist of four portraits in Japan, and one portrait of Gohachiro Namura, a translator to the expedition, in the B. P. Bishop Museum in Honolulu, Hawaii.

Although, as with so many other early expeditionary photographers, the actual artifacts of his career have largely disappeared, we are fortunate in having enough access to their facsimiles to appreciate the vision and skill Eliphalet Brown, Jr. brought to a difficult role.

Bruce T. Erickson

Biography

Eliphalet Brown, Jr. was born in 1816 in Newburyport, Massachusetts. An accomplished artist, he excelled at lithography and worked for many of New York's principal lithographic publishers in the mid 1800s, including Currier and Ives. He learned daguerreotype from his younger brother James Sydney Brown, who had also come to New York to earn his living as an artist, but who became instead Matthew Brady's first daguerreotype operator, leaving after several years to practice daguerreotype.on his own. When Commodore Matthew Perry of the U.S. Navy embarked on the famous expedition to open up Japan to the West, he selected Eliphalet Brown, Jr. to be his official photographer. From 1852 to 1855, Brown made approximately four hundred daguerreotyes in Japan and other locations in the orient. Nineteen of these were rendered as lithographs and published in a three volume U.S. Government report, usually designated or credited as "dag by E. Brown." At the conclusion of the expedition, Brown continued in Navy service, never again being active in any area of art or photography. He retired around 1875, married and lived quietly until his death on 24 January, 1886.

See Also: Matthew Brady.

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BROWNELL, FRANK A. (1859–1939)

Frank Brownell was born in Canada in 1859 and moved to Rochester, New York, where he was apprenticed to Yawman & Erbe. He opened his own cabinet-making and camera shop in Rochester and began working for George Eastman in 1885. In 1892 Eastman established the Camera Works with Brownell working exclusively for the Kodak company. He designed over sixty cameras for Kodak between 1885 and 1902 including the Brownie camera. After finally leaving Eastman Kodak in 1906 he moved into making motors for marine and automobile use. He died on 2 February 1939.

Frank Brownell was born on 4 February 1859 in Vienna, Canada. He moved to Rochester, New York, after graduation in 1875 aged 16 and was apprenticed to the machinists Yawman & Erbe. In his own time designed a plate camera that was accepted by the Union View Camera company for manufacture. In 1883 he opened his own cabinet-making and camera shop at 282 State Street, Rochester, and produced a large range of studio and professional cameras.

In 1885 George Eastman, founder of the Eastman Dry Plate and Film Company asked Brownell to produce the Eastman-Walker roll film holder, a largely wooden device which carried a paper roll for producing a negative and could be fitted on to any camera with a standard back. After legal threats derailed Eastman's first attempt to introduce a detective camera in 1887 Eastman turned to Brownell around the 10 October 1887 with his idea for a new camera. Brownell began making the wooden parts on 12 October 1887 and Yawman & Erbe were asked to produce the metal parts and shutter mechanism and to undertake the assembly. The camera was sold as the Kodak and introduced in 1888.

Although Brownell's involvement in the original Kodak was confined to making the wooden body and transporting them to Yawman & Erbe by 1889 he was designing much of the first Folding Kodak camera which he patented and in 1891 he developed a daylight loading cartridge and a series of three Daylight Kodak cameras which could be loaded and unloaded in subdued light.

In April 1892 Brownell's factory suffered a fire for which he was largely uninsured and Eastman constructed a new building at 333 State Street close to his own factory to manufacture cameras for a cost not exceeding $60,000. The building had 55,000 square feet of floor area and a 126 horsepower engine to drive machinery. The provision of plenty of daylight was a particular feature. Eastman called the factory the Camera Works and rented it to Brownell who signed an exclusive contract with Eastman to design and make Kodak cameras. It was occupied from 1893 and, in reality, was Eastman's first step in establishing his own camera manufactory.

In 1896 the factory employed 700 people which had grown to over 1,000 by 1902.

The Pocket Kodak camera was designed by Brownell in 1895 and was produced at a cost price of 80¢ and sold to Kodak for 87¢ who retailed it with film for $5.00. The Cartridge Kodak followed in 1897. By the end of the 1890s the Brownell Manufacturing Company was the largest volume producer of cameras in the world. Eastman described Brownell as 'the greatest camera designer the world has known.'

Brownell was by all accounts a benevolent employer and offered an employee reward scheme, a hospital, meals, a lending library and social events. The Brownell Manufacturing Company (and also the Eastman Kodak Co) received a silver medal in 1900 at the Universelle Exposition in Paris from the Department of Social Economy.

On 5 June 1897 the Eastman Kodak Company purchased the machinery, tools and fixtures owned by Brownell for $23,195.79 in Kodak stock and under a new agreement Brownell paid rent to Kodak for their investment and produced cameras at agreed prices with an aggregate profit not to exceed 10 percent. The following June this was reduced to 5 percent so that Eastman could keep his camera's competitively priced.

In 1899 Eastman asked Brownell to design a camera that was cheaper and easier to use than any previous Kodak camera. The Brownie was the result, and the camera was the subject of several United States patents one of which from 11 April 1899 was of direct relevance. It was shipped to dealers on 1 February 1900, and by the time the original Brownie model was superseded by the No. 1 Brownie in October 1901 around 245,000 had been sold.

Brownell was increasingly being seen as a bottleneck to further mass camera production. Plans for a new camera building at Kodak's main site, Kodak Park, were produced as a way of easing Brownell out but the expense of the building meant that the existing camera works were extended and Brownell was retained. Brownell, although similar in age to Eastman and originally with the same innovative approach to design which had first attracted Eastman to him, had not kept up with new production methods and he was failing to come up with enough new camera models. He was also seen as a poor manager and his handling of a labour dispute in 1901 had not impressed Eastman.

On 1 October 1902 Eastman, recognising Brownell's past importance to his business, proposed buying him out from the camera making business for $130,090.64 and to retain him as a camera design expert at the substantial sum of $12,000 a year. Brownell accepted the offer and continued to work at Eastman's new Camera Works Division of the Eastman Kodak Company.

He finally left the Eastman Kodak Company on 1 May 1906 to go into business on his own account. Between 1885 and 1902 when Brownell left the day-to-day running of the camera business over sixty new models and designs had come from him. He had been responsible for the design and mass-production of all Kodak's cameras and was cited as co-patentee for many cameras including models such as the Panoram and was behind the camera industry's most successful camera ranges: the original Kodak, the Cartridge Kodaks, the Folding Kodaks, the Pocket Kodaks and the Brownie camera.

After leaving Eastman Kodak Brownell bought into a previously existing business and established the Brownell-Trebert Company between 1906–1907 producing marine and automobile motors, and then the F A Brownell Motor Company from 1908–1913 and finally the Rochester Motors Company Inc. from 1913–1919. He built a range of 15–160 HP engines and supplied the first gasoline powered motor yacht for the United States Navy.

Brownell remained friendly with Eastman until Eastman's suicide in 1932 and was involved with several organisations in Rochester. The economic depression of the early 1930s had affected his own financial position, and at the time of his death on 2 February 1939 in Rochester he had lost most of his fortune.

MICHAEL PRITCHARD

See Also: Kodak; and Eastman, George.

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BRUCKMANN VERLAG, FRIEDRICH (1814–1898)

German fine art publisher

Friedrich Bruckmann, born to wealthy parents in Deutz (Cologne) on 4 June 1814, was already 44 years old when he set up a publishing house for art and science —the *Verlag für Kunst und Wissenschaft*—in Frankfurt am Main in 1858. It was born more from his interest in art than in publishing. Friedrich's father, Johann Wilhelm Bruckmann, was a successful merchant, land

owner and mayor. In his younger years he undertook several educational journeys, including both France and Italy, spending two years in Paris. He even served as an apprentice at the Sèvres porcellain factory, founding his own short-lived factory in Deutz on his return.

After first moving the company, which he called Friedrich Bruckmann Publishers, to Stuttgart in 1861, Bruckmann finally settled it in Munich in 1863. In 1864 a photographic institute and printing workshop were added. This setup was unique to the *Bruckmann Verlag* at the time, permitting Bruckmann to realise his products completely and autonomously within his own facilities.

His first success as a publisher came in the first half of the 1860s with a photographic portfolio of Goethe's *Frauengestalten,* the photographs reproducing drawings by the director of the Munich Academy of Arts Wilhelm Kaulbach. Kaulbach's so called *Goethe-Galerie*, drawings of female characters found in Goethe's fiction, was reproduced in large-size photographs by Josef Albert. Bruckmann also issued this work in different techniques, formats and prices (a sales strategy that would become typical for him) and tried to launch a *Schiller-* and *Shakespeare-Galerie* as well.

To use the enhancement of orthochromatic material by the photographer Eugen Albert, the son of Josef Albert, the *Photographische Union* [Photographic Union] was created in 1884 as a photographic institute, separate from the *Bruckmann Verlag* although it remained under its ownership. The institute issued photographic reproductions of contemporary 19th century art, mainly paintings, in different formats.

Around 1900 the firm consisted of a printing workshop, engraving manufactory, another printing room for collotype and photogravure, photographic laboratories and studios. From its base in Munich, the publishing house became renowned, with branches opening in Vienna, Berlin, Paris, London and New York by 1868. Bruckmann was also innovative in his utilization of new means of advertising. He maintained good relationships with bookstores in order to have his products presented in the best and most effective way. The company sent out leaflets, colored posters and multilingual catalogues to promote its books.

The *Bruckmann Verlag* soon became famous for its high-quality reproductions produced to the newest technical standards. Friedrich Bruckmann adopted a variety of new developments in photomechanical printing and developed them further. He took up the Woodburytype in 1869, in 1875 the more reliable and efficient collotype and in 1882 the printing office acquired the new process of photogravure as well as the Autotype process. The firm was the first German one to apply a rapid collotype in 1885, a rotogravure press in 1900, and in 1890 they began to produce some of the first multi-color prints by multiple plate photogravure. By advancing the use of photomechanical reproduction, Bruckmann was able to supply a larger quantity of images faster, and to satisfy the wider public demand for reasonably priced art prints.

By this contribution, Bruckmann pioneered modern German fine art publishing. Munich, where he evolved his company, was at the turn of the century a center for art publishers and booksellers as well as reproduction and printing. The *Bruckmann Verlag* published mostly within the archaeological and art sector, focussing on antique art, the Renaissance and the 19th century, thereby particularly enhancing artists with a high reputation. It published costly and elaborate deluxe editions for the well-equipped bourgeoisie as well as in smaller, cheaper formats intended for broader consumption. The company also produced standard works in art history, monographs of famous artists, as well as large and expensive picture-atlases and documentation for scholarly use. These latter were made possible by the technical developments encouraged within the company. It specialised in reproducing complete museum and private collections as well as publishing portrait series and portfolios of famous paintings and sculptures, which were usually image collections with minimal text.

One of Bruckmann's most important contributions was the first illustrated German art journal, begun in 1885, the *Kunst für Alle* [Art for All] which concentrated on contemporary art. It was one of the most influential and long-running publication at the time since it addressed a wide non-specialist public both in its arrangement and its low price. The journal incorporated all genres but focused on paintings, and, since illustrations played a conspicuous role in it, many new methods of photomechanicalprinting were used. Thematically, it was to a large extent restricted to national realistic art—being an organ of the middle class—and was much in favor of the Impressionists. As a consequence, it excluded other avantgarde art forms almost completely. From 1891 to 1899 the journal had a division called *Der Amateurphotograph* [The Amateur Photographer] edited by Adolf Miethe which dealt with technical questions and the use of photographs for reproductions. In 1899 *Kunst für Alle* was combined with the *Dekorative Kunst* [Decorative Art] (founded in 1897 for international applied arts) under the name *Die Kunst* [The Art] under which name it was issued until 1944, at which time it was renamed *Die Kunst und das schöne Heim* [Art and Beautiful Home] and continued until 1984.

In 1883 *Bruckmann Verlag* was transformed into a private limited company, run by Bruckmann's two sons, Alphons (1855–1945) and Hugo (1863–1941), who had joined the firm in 1870 and 1881 respectively. In 1883 it was renamed *Verlagsanstalt für Kunst und Wis-*

senschaft, vormals Friedrich Bruckmann and changed name again in 1896 to *Verlagsanstalt F. Bruckmann A.G.* After Friedrich Bruckmann's death in Arco, South Tyrol, 17 March 1898, both sons directed the company, Alphons as technical director and Hugo as publisher.

Friedrich's son Hugo was an early supporter of Adolf Hitler and an active member of the National-Socialist Party (NSDAP) which he joined in 1925. Although the company did not publish a considerable amount of ideological literature, it remained an extremely conservative voice in art criticism, producing the catalogues and posters for the *Great German Art Exhibitions* in the *House of German Art* in Munich. In 1941 the grandson Alfred Bruckmann, who had joined the firm in 1922, became executive secretary. The *Bruckmann Verlag* was still considered essential during the war until 1943 and thus received sufficient paper supplies. After World War II the company was officially dismantled as a result of its relationship with the Nazi regime, but was refounded in 1948 and again developed into a leading publisher of art prints. To the hitherto existing areas art history and art books were added geography, travel, leisure and alpine literature from the 1930s onwards. In 1966 the company was taken over by the Stiebner family. From 1999 onwards the art sector was abandoned, leaving only publications on travel, leisure and alpine subjects.

Friedrich Bruckmann had both a paedagogical and commercial interest in popularizing art as one can see from his art journals. He was in favour of artistic education for wider sections of the public and discovered a profitable source of income in the distribution of large quantities of art reproductions to a broader public.

STEFANIE KLAMM

See Also: Albert, Josef; Archaeology; Architecture; Art photography; Books illustrated with photographs: 1860s; Books illustrated with photographs: 1870s; Books illustrated with photographs: 1880s; Books illustrated with photographs: 1890s; Germany; Collotype; Photomechanical: minor processes; Woodburytype, Woodburygravure; History: 5. 1860s; History: 6. 1870s; History: 7. 1880s; History: 8. 1890s; Miethe, Christian Heinrich Emil Adolf; Photography and Reproduction; Photography of Paintings; Photography of Sculpture; and Portraiture.

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BUCHAR, MICHAEL
(active 1860s–1870s)
Professional photographer

Michael Buchar worked as a photographer in Orenburg in 1860–1870s. He was the master of landscape and ethnographic photography. He prepared an album of photographs showing national types of the Orienburg Province to present to the future Emperor Alexander III. To make the ethnographic images look more naturalistic he hand-coloured the monochrome prints. These photographs were created in the studio and Buchar later painted landscapes into the prints' background.

The 1860s and the beginning of the 1870s in Russia was the time in which Buchar was one of many photographers who created ethnographic albums which, apart from being valuable for scientific purposes, depicted the various regions and societies of the Empire as well. Such albums were usually presented to the Emperor or other members of the Romanov family. At the same time as Buchar, photographer A. Karelin together with the famous Russian landscape artist I. Shishkin, created the album "Nizhniy Novgorod" which included the landscapes of the city and its suburbs and included photographs illustrating the nations living in Nizhniy Novgorod province. Like Buchar, both Shishkin and Karelin painted the prints using watercolor. The sole copy of the album was presented to the Emperor Alexander II. The Photographer Nekhoroshev created "The Turkistan Album" published in 1871–72. One of the copies was also presented to the Emperor Alexander II.

ALEXEI LOGINOV

BUCKLE, SAMUEL (1808–1860)

Active in photography in Peterborough from at least 1851 and in Leamington from 1853, Buckle is undoubtedly a pioneer though his reputation never really became evident due to his ill-health in the later 1850s. He built at the rear of his house in Leamington a 'laboratory' presumably a combination of camera workshop and studio. From an early stereo photograph by Buckle this is clearly a purpose-built three-storey brick structure quite unlike other modest or temporary glasshouse studios in Britain: if this is the case it is one of the earliest example of a substantial structure purely erected for photographic purposes in Britain.

There is some evidence directly linking Buckle with H.P. Robinson: they lived only ten minutes apart and they were both in contact with Joseph Glover, a local publisher and bookseller, so this connection warrants further investigation. Robinson must have been well aware of Buckle as a photographic pioneer and could even have received instruction from him. Robinson does not appear in Buckle's account book but there are references to J.D. Llewellyn, Henry White, G.S. Nottage, Marion & Co., and P.H. Delamotte as well as a series of photographic equipment suppliers including Ross. Buckle exhibited extensively, and amongst over fifty of his topographical images contained within two unpublished albums in the National Media Museum, Bradford, are several of his widely-exhibited images. One album contains a beach view showing Buckle with Sir David Brewster and 'Mr Roslyn.' The other album also contains two prints of glassware on shelves taken by Fox Talbot.

At least fourteen original prints exist at Peterborough Library, others are in Rugby Library and others will exist in Warwickshire archives. The Wheatstone Papers at King's College London contain stereo views by Buckle.

Despite a few advertisements, there is no evidence for any commercial portrait work so he is an example of how 'new money' could attain 'gentleman' and 'amateur' status within one generation. This shift is signified by his fashionable Leamington address after having spent much of his life in Peterborough or Cambridgeshire. Buckle's usual medium was the calotype but it is clear from Fox Talbot correspondence that this had changed by 1858. Buckle tells him "I work now—when I do take a picture at all—by the Collodion Albumen Process... Portraits I never take nor can I tolerate any but those which are corrected by subsequent painting. Views have not relief enough for my artistic eye and pure untouched Photographic Portraits are great distortions, as you are fully aware" (Fox Talbot correspondence 6 May 1858).

No evidence exists of a photographic career prior to the calotype prints exhibited at the Great Exhibition of 1851 which received a Council Medal—but since he used Whatman paper with a 1849 watermark earlier work is possible. The Council medal may have brought him to the notice of Prince Albert who acquired nine calotype prints in 1854. Thereafter he exhibited over 140 prints in London, Dundee, Glasgow, and Birmingham between 1852 and 1857. From advertisements and his account book it is apparent that Buckle made and sold his own lightweight cameras for paper or glass negatives and that he gave instructions in calotype photography.

All known views by Buckle were produced before 1857 and almost all are topographical using the picturesque conventions of the period. These views are among the earliest to survive for the areas he covered in Northamptonshire, Cambridgeshire and Warwickshire but he also is known to have travelled in the Gloucestershire, the Isle of Wight, Sussex and Wales. Thirty of his views were privately published in *Calotype Pictures by Samuel Buckle* with a printed list of subjects. Prince Albert's copy of this was sold at Sotheby's 1 July 1977 (Lot 171) with a paper label 'Prince Albert's Library.' What is certain is that purchases of prints by Buckle were certainly made by Prince Albert by 1854 since they are included in a list of prints acquired from Eduard Baldus and Antoine Claudet among others.

His only other photographic reputation relates to the 1855 "Buckle Brush" for coating calotype paper. Apart from a few advertisements and just one obituary there appear to be no other references to Buckle in any of the post-1854 photographic journals—it appears that his "long and painful illness" meant that his photographic activities ceased at the very point where he may have become better known.

Ian Leith

Biography

Samuel Buckle was born in Orton Longueville, Huntingdonshire [now near Peterborough, Cambridgeshire] 14 September 1808 [christened 2 October]. His father was the famous jockey Francis Buckle, and the family inherited a substantial brewery in Peterborough which was managed by Samuel Buckle from about 1841 until its sale in 1853. He married Anne Ball at St John the Baptist church in Peterborough 1845 and had moved to Royal Leamington Spa, Warwickshire by December 1853 where he lived at No.5 Beauchamp Square. Buckle died in Leamington 30 May 1860 leaving an estate including property valued under £5000. His tomb is in Brunswick Street Cemetery, Leamington.

See Also: Robinson, Henry Peach; Llewelyn, John Dillwyn; White, Henry; Marion & Son, A.;

Delamotte, Philip Henry; Ross, Andrew & Thomas; Talbot, William Henry Fox; Brewster, Sir David; Wheatstone, Charles; Baldus, Édouard; and Claudet, Antoine-François-Jean.

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BULL, LUCIEN GEORGES (1876–1972)

Irish chronophotographer

Born January 5, 1876, in Dublin, Ireland, to a British father and French mother, he lived mostly in France. His brother was cartoonist and photographer René Bull. Lucien Bull was a prolific innovator, responsible for pioneering high speed cinematography in order to view movement in slow motion. Engaged in 1895 by the French physiologist Etienne-Jules Marey, Bull assisted with chronophotographic experiments; his duties included developing and printing the sequence-picture negative strips for analysis. He was also sent out onto the streets of Paris to shoot scenes with Marey's Chronophotographe camera, which used non-perforated film. Bull later remembered trying to project one of Marey's filmstrips, at a time when many inventors were making efforts to present their celluloid-based photographic sequences as moving images on a screen. Lucien Bull's major contributions to the Marey Institute started after Marey died in 1904, and included high-speed cinematography of insect flight (some stereoscopic), and balistics. Bull also patented an improved version of the electrocardiogram (ECG) in 1938. He remained at the Institute as sub-director for decades, receiving honors from the French and British. He was active until his death on August 25, 1972.

STEPHEN HERBERT

BUNSEN, ROBERT WILHELM (1811–1899)

Chemist

Robert Wilhelm Bunsen was born March 31, 1811, in Goettingen as the son of a professor of modern languages. At the age of 19, he earned his PhD in chemistry in Goettingen and went to teach in Marburg and Breslau. In 1852 he began his own laboratory at the Heidelberg University and stayed there until his death on August 26,1899. In more than forty years of work Bunsen made German chemistry one of the leading sciences in the world. The only thing he seems to have less contributed to bears his name: the Bunsen burner.

This extremely versatile man contributed to many sciences through the use of chemical analysis, and some of his efforts helped photography. When experimenting with the carbon-zinc electric cell he invented the first grease-spot photometer in 1844. In the 1850s, he was the first to obtain magnesium in metallic state and measure its qualities. By following the suggestion to use burning magnesium as a fast burning but bright light source, he eventually named the base of flash light for photography in 1859. Similar to Edmond Becquerel and in cooperation with Gustav Kirchhoff, Bunsen found that each element emits a light of characteristic wavelength thus contributing tremendously to the basic researche on color photography. In 1862, Bunsen and Roscoe published the first law of blackening as reciprocity of light: Each photo-chemical effect is the product of the light intensity and the time involved, each product producing the same effect of blackening by light emission. This law was later corrected by Karl Schwarzschild. Bunsen's later enquiries lead him away from photography to more ecologic and industrial questions.

ROLF SACHSSE

BURGER, WILHELM JOSEPH (1844–1920)

Austrian photographer

Born into a comfortable middle-class Viennese family, Burger received a classic education but displayed a great talent for art. Accordingly, in 1855 his parents enrolled him in the *Akademie der bildenden Kunste* where he studied until 1860. Moving to Munich to continue his studies he was increasingly attracted to photography, thanks to the influence of his uncle. Burger returned to Vienna in 1863 and studied photography at the University where he demonstrated remarkable ability. By 1868 he was regularly lecturing and publishing articles. He had come to the notice of the Court which, that year, appointed him photographer to the Austria-Hungary mission to the Far

East which set off to initiate diplomatic and commercial relations with Siam, China, and Japan. Burger took many outstanding photographs in the Far East—portraits, landscapes and of works of art. He returned to Austria in March 1870 and was rewarded by being appointed Court photographer. In 1872 he was the photographer to the Austria-Hungary Arctic Expedition, and later for expeditions to Asia Minor. Constantly experimenting with new technology and refining his technique, Burger became the most celebrated photographer in Austria. He died in 1920. (A portfolio of his 1869 Far Eastern photographs is in the *British Library*: (Burger, Wilhelm), *Bilder Aus Japan*, Wien: Druck V. M. Munk, 1871.)

TERRY BENNETT

BURKE, JOHN (1843–1900)

English, photographer

As a teenager, Burke served in India as an apothecary assistant in the Royal Artillery. He left the army in 1861 to join William Baker, a retired sergeant who had started a photographic studio in Peshawar. Together they formed Baker and Burke Studio (1867–72), the first commercial studio in that region. In 1873 Baker left the firm and it became J. Burke & Co. with studios in Peshawar, Rawalpindi, and Lahore; it continued to operate until 1900. Perhaps because of his military background, Burke was able to accompany, in an quasi-official capacity, most of the British military campaigns along the North West Frontier and Afghanistan from the late 1860s to 1897. He was the first to photograph Kabul after it was taken by the British in October 1879. Burke offered his photographs from the region—present day Pakistan, Kashmir, and Afghanistan—in a series of commercially produced albums collectively known as the *Afghan War Album*. There are a number of variants of *Afghan War Album*, corresponding to the Second and Third Afghan Wars and related campaigns. The albums and individual prints were available through Burke's studios and through a number of booksellers in India and London. In addition to military subjects, Baker and Burke, then Burke, provided views of landscapes and archaeological sites, as well as a range of subjects in Lahore—imperial offices and pageants, bazaars, mosques, and palaces.

KATHLEEN HOWE

BURNETT, CHARLES JOHN (1820–1907)

Born 1820 at Kenmay, Aberdeenshire, educated privately and at Edinburgh University, he became an innovative photochemical experimenter, and founder-member of the Photographic Society of Scotland. Burnett made the first photographic prints employing light-sensitive uranium salts, which he described to the 1855 meeting of the British Association for the Advancement of Science in Glasgow, illustrated by prints and photograms in the accompanying exhibition. The images were of uranyl ferrocyanide or silver, depending on development. Burnett was a prolific contributor to photographic journals, and he showed an early application of platinum toning silver prints at the Edinburgh Photographic Society exhibition in 1856–7. His uranium sensitizers furnished gold images (a form of chrysotype) in 1857, when he also made the first prints in palladium, antedat-

Burke, John. Camp Scene Jellalabad.
The J. Paul Getty Museum, Los Angeles

ing William Willis's palladiotype by 60 years; Burnett's "cuprotype" of the same year anticipated Obernetter's process of 1864.

Burnett admitted his lack of perseverance: "I cannot well find time for the prosecution of discovery, and for pretty specimen making, and as soon as I see unmistakable indications of what are the real capabilities of any process, I am generally off to something else." His priority was challenged in 1858 by Abel Niépce de Saint-Victor publishing identical uranium processes. Burnett showed his "Experiments in Printing" at the London International Exhibitions in 1859 and 1862, and was commmended with an Honourable Mention, but none of his prints is known to have survived. He died a bachelor in Aberdeenshire in 1907.

MIKE WARE

See Also: Positives: Minor Processes; and Light-Sensitive Chemicals; Photograms of the Year (1888–1961); and Platinum Print.

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BURTON, ALFRED (1834–1914) AND WALTER (1836–1880)

English photographers and studio owners

Alfred Henry Burton born 1834 and Walter John Burton born 1836 were the eldest children of John Burton and Martha Heal. John Burton who started as a printer, bookbinder and bookseller opened a photography studio in Leicester in 1858 and his four sons trained in the business. Alfred went to New Zealand in 1856 and worked as a printer in Auckland then Melbourne, Australia before returning home in 1862 to manage the Nottingham branch of John Burton & Sons. Walter immigrated to Dunedin, New Zealand in 1866, where he set up a studio in Princes St. In 1868 he was joined by Alfred. The Burton Brothers plied a trade in portrait photography which was mostly done by Walter while Alfred travelled, taking landscape views including panoramas. Walter left the partnership in 1876 and travelled to Europe, returning to Dunedin in 1878 with new equipment and he traded as the Royal Gallery of Photography in George St. His life was cut short when he committed suicide by cyanide poisoning on 10 May 1880. Alfred was joined by his brother John William in 1877 who opened an Australian branch of Burton Brothers in Dean St, Albury in 1880. Alfred formed a partnership with Thomas Mintaro Muir in 1882, and they produced some of the best landscape work in New Zealand, some on 18" x 20" plates, as well as studies of the Maoris. Losing an arm due to gunshot wound in 1890 Alfred passed work over to employee George Moodie who joined Thomas Muir in the firm Muir and Moodie when Alfred Burton retired in 1898. The Albury studio had closed in 1895. Alfred Burton died 2 February 1914 in Dunedin.

MARCEL SAFIER

BURTON, WILLIAM KINNINMOND (1856–1899)

English engineer and amateur photographer

Burton was born in Edinburgh and educated at the Collegiate School. Despite coming from a family of lawyers, Burton decided to pursue a career in engineering and, in 1873, apprenticed for five years to a local firm of engineers—there being no engineering degree course in those days. He progressed to the post of resident engineer of the London Sanitary Protection Association and was offered, in 1887, the post of Professor of Sanitary Engineering at Tokyo Imperial University. Amongst many engineering achievements, Burton is credited with having designed the water supply systems for most of Japan and Taiwan's major cities.

Prior to going to Japan, Burton had become a keen amateur photographer and a noted expert and writer in the field. In Japan he formed relationships with Japanese photographers such as Ogawa Kazumasa and Kajima Seibei, and was instrumental in introducing the country to many new photography techniques. In 1889 he founded the *Nihon Shashin Kyokai* [Photographic Society of Japan], and in 1893 organized Japan's first international photographic exhibition. He immersed himself in Japanese society and became one of the first Westerners to marry a Japanese. If Burton had not gone to Japan, arguably photography in that country would have developed at a slower pace. He died in Japan in 1899.

TERRY BENNETT

BUSCH, EMIL (1820–1888)

German photographer, merchant, and mechanic

Emil Busch was born August 6, 1820, in Berlin as the grandson of Johann Heinrich August Duncker who had

founded the Optische Industrie Anstalt at Rathenow in 1801 for the production of reading glasses. Trained as a merchant and mechanic, he began working for the company in 1845. The production of photographic apparatus and lenses from 1852 on bore the name Emil Busch Rathenow, and in 1872 the company became a stock company. Emil Busch died in Rathenow on April 1, 1888.

When Emil Busch took over the Optische Industrie Anstalt at Rathenow, not far from Berlin, from his uncle, in 1845, he gained a prospering business manufacturing glasses for reading and military purposes, and at that time, was without a competitor for miles. From 1850 on, this industrial paradise several competitors came into Rathenow and its surroundings. In 1852 Busch established the Busch-Rathenow Company for photographic apparatus and soon specialized in lenses, and later the wide-angle lenses invented in 1865 by members of his staff. Busch installed modern production facilities in his company by which he converted common manufacturing into a large scale photographic production process. When the Prussian-Danish War started in German countries between 1864 and 1871, Busch became the main military supplier of telescopic glasses, field cameras, and photographic lenses. In 1872, Busch converted his business into a stock company allowing many benefits for his employees. Up until the outbreak of World War I, Busch Rathenow was one of the leading German companies engaged in optical manufacture, producing, amongst other things, large glass mirrors and early mirror lenses, and their products remained unrivalled in quality until the end of the nineteenth century.

ROLF SACHSSE

BYERLY, JACOB (1807–1883)

American daguerreotypist

Jacob Byerly became the first operator of a permanent daguerreian gallery in Maryland, outside Baltimore, when he opened an establishment in Frederick in 1842. He changed the original spelling of his surname from Bierly.

Among his known daguerreotypes are a street scene of Frederick and a portrait of Barbara Frietchie, who is said to defiantly hung an American flag from her window as the Confederate army entered Frederick in 1862, inspiring John Greenleaf Whittier's famous poem with the line, "Shoot if you must this old gray head…." One source says Byerly's second wife, Catherine E. Hauer, was a niece to Frietchie.

The first issue of the Frederick business directory, published in 1859, lists Byerly with an ambrotype and photograph gallery at 55 Patrick Street. The 1860 census reports that he produced 1,500 images annually with the help of two male employees. Byerly continued operation the Frederick studio until 1868, when his son, John Davis Byerly, took over. The Byerly studio was eventually taken over by a grandson, Charles, and continued as a leading Frederick photographic business until 1915, when the building that housed the studio collapsed.

BOB ZELLER

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CABINET CARDS

The cabinet format was designed to recreate the success of carte de visite photographs, which were produced in the millions worldwide beginning around 1859. In the United States, business at photography galleries slowed after the Civil War, and the trade began looking for a new product. The answer came from Britain, where a similar business slowdown led F. R. Window of the London studio Window & Bridge to suggest the cabinet format in 1866. In England, *The Photographic News* championed the new format; in the United States, *The Philadelphia Photographer* campaigned for its adoption. Manufacturers also benefited from the new format, selling lenses, printing frames, mounts and albums designed for cabinet cards. Like the *carte de visite* before it, the cabinet card format became an international standard; cards produced in Bombay or Yokohama would fit albums in the parlors of Edinburgh or Chicago. The format remained popular into the early years of the 20th century.

Cabinet cards are generally albumen print photographs from wet-plate collodion negatives**,** mounted on cards measuring 4.25 × 6.5 inches. The size of the print is 4 × 5.5 inches, allowing for a border all around and an extra deep border in the lower portion of the card. This extra-deep portion is intended to allow the card to be grasped and inserted into an album without handling the photographic print. Later cabinet cards—those made in the late 1890s and early in the 20th century—are often silver prints made from dry-plate negatives, but it is their size and type of mounting that makes them cabinet cards. A brisk trade was done in albums for this format, ranging from simple velvet-covered styles to elaborate leather-bound versions with miniature music boxes that played when the cover was opened. Some albums featured chromolithographs decorating their pages; rarer examples, often produced in Japan, have pages hand-decorated in ink and watercolor.

Because each cabinet card offered nearly four times the image area of a *carte de visite,* photographers suddenly had many more compositional options. *Cartes* were usually limited to a few simple poses—full-length standing figure by a column, vignetted bust portrait, or seated figure beside a table. Cabinet cards offered more opportunities to show groups or to introduce elaborate backdrops and props. As with the earlier format, photographers sold cabinet cards of celebrities and royalty, which people would collect in albums along with their family portraits. Some of the most creative work in the cabinet format can be seen in the theatrical images produced by leading studios in New York, London, and Paris.

Significant photographers utilizing the cabinet format included Nadar**,** Charles Reutlinger, Napoleon Sarony, W. & D. Downey, Elliott & Fry, Charles D. Fredricks and Mathew Brady. Julia Margaret Cameron's magnificent large compositions were rephotographed and issued in the much-smaller cabinet format. Sarony specialized in photographing theatrical people and produced many striking images. Often these were simple and direct, such as his portraits of Ellen Terry and Oscar Wilde. But Sarony was justly famed for his use of props and backdrops, capable of turning his New York studio into the Egyptian desert or the icy North Pole. The studio featured a mummy, ancient armor, stuffed birds and a Russian sleigh. Sarony's eye for potentially picturesque props made his sitting-room a "dumping ground for the dealers in unsalable idols, tattered tapestry, and indigent crocodiles."

The cabinet format was also used for purposes other than portraiture. In France, Eugene Appert issued a series of photomontages intended for political purposes during the Franco-Prussian War and the Siege of Paris (1871). City views and pictures of prosperous merchants in front of their stores were popular. The works of lead-

ing landscape photographers, such as W. H. Jackson, Carleton E. Watkins, and Adolphe Braun appeared in the cabinet format, especially after the financial panic of 1873 caused havoc with the American economy and made large format landscapes too expensive for most patrons. Occasionally cabinet cards were used for advertising, harnessing the versatility and ubiquity of the format to hawk locomotives, face powder, fruit trees, machinery and patent medicines. The vast majority of cabinet cards served loftier purposes, recording for posterity the tangible evidence of family milestones—from the birth of a new baby to college graduations and the burial of a beloved relative. Millions of these personal mementos were made in studios around the world, and they account for the longevity and popularity of the cabinet card format.

WILLIAM. B. BECKER

See Also: Carte de Visite; Albumen Print; Wet-plate Collodion Negatives; Silver Prints; Dry-plate; Sarony, Napoleon; Nadar; Brady, Mathew; Cameron, Julia Margaret; Jackson, W. H.; Watkins, Carleton E.; and Braun, Adolphe**.**

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CADETT AND NEALL DRY PLATE LTD.

The business of Cadett & Neall was established in August 1892 as a collaboration between James William Thomas Cadett, a chemical engineer, and Walter Neall, a photographic dry plate and paper manufacturer and a medical doctor. The company's trademark 'swift as light' was registered on 16 September 1892. Cadett appears to have been the technical force behind the business.

James Cadett had patented a pneumatic shutter (British patent number 4367 of 21 November 1877) and patented two further shutters in 1878 and 1884. He was elected a member of the Photographic Society in 1878. Two further patents in 1894 in collaboration with the Reverend James Randolph Courtenay Gale MA described improvements to packing and storing photographic chemicals as semi-liquids in tins and for photographic dark slides. His career between 1877 and 1892 is unknown.

Cadett's principal contribution to photography was to the mechanisation of plate and film coating. His first and most significant patent was number 9886 of 31 July 1886 which described a coating machine with two improvements for regulating the thickness of the emulsion being laid down on to the plate or film and for regulating the delivery of the emulsion from the storage trough to the glass plate. His two subsequent patents of 10 October 1887 and 2 April 1889 further refined these.

From it's founding in 1892 Cadett and Neall grew very rapidly and by October the firm reported that it's plate sales were doubling every month. In Spring 1896 it reported an increase in sales of 62 percent for the ten months ending October 1895 compared to the previous year and an increase of 52 percent for January and February 1896 compared to the equivalent period in 1895. By February 1898 the firm claimed sales of 'millions' of plates and the largest sale in the United Kingdom of any make.

To cope with this growth, the firm enlarged its Greville Works in late 1892 and the following year built it's Crampshaw Works which would double production capacity and these were enlarged in 1896 and in 1898 its Victoria Works were built for paper and film production. All were located in Ashtead, Surrey. New machinery was installed in mid-1894 for meeting the demand for its Velox developer.

From the outset the firm adopted the marking of its sensitised materials with Hurter and Driffield numbers indicating sensitivity to a carefully calibrated standard. Marion & Co had been the first to adopt the H & D scale and Alexander Cowan from Marions assisted Cadett & Neall in applying the standard to their own plates and manufacturing. This was partly responsible for the high quality of the firm's goods. Film was added to the firm's output from late 1892–1893 and specialised plates for photomechanical work in 1893. The orthochromatic plate was discussed by Cadett in a paper read to the Photographic Society and published in the *Journal of the Photographic Society* on 28 February 1896 and the firm began making an orthochromatic plate commercially that same year under the name Spectrum, with a fine grain high speed version being introduced in February 1899. The firm claimed it was 'the only plate of its kind in the world.' Its Lightning plate was claimed the 'quickest in the world.' The firm's plates were rated the second most popular in a vote by readers of *Photographic Life*.

Away from plates the firm produced a range of chemical developers with Velox being the most popular and in 1898 a range of Printing Out Papers, Bromide and other specialised papers were launched in various sizes and surface finishes. The following year two types of gelatino-chloride papers were added with different tonal characteristics and speeds and in late 1899 a platinum black bromide paper in a variety of surfaces was announced.

To support it's sensitised goods the firm promoted a range of exposure tables and calculators. 10,000 of its own calculator had been sold by November 1897 and sales of nearly 20,000 for Dibdins calculator, were claimed by July 1899. Cadett also designed exposure tables with Lambert which sold under their joint name.

Between 1892 and 1899 the firm published a free periodical called *Dry Plates* which went from an initial circulation of 5000 copies to 10,000 by the third number and 30,000 copies by 1898. Cadett authored a number of photographic publications including some with his earlier co-patentee James Gale who also later edited *Dry Plates*.

Cadett & Neall's plate coating machines, based on Cadett's patents, were widely acknowledged as superior. They were manufactured by R W Munro of London at a cost of £175 and they were used by several large plate manufacturers in Britain, including the Britannia Works Company, later Ilford, Limited, who all rented them for £100 a year.

In 1897 the firm's growth and size led to it becoming a limited company with a share capital of £75,000. Cadett explained in *Dry Plates* that this change of status was required to extend the business and to add printing papers to the firms output for which capital was required. The new company was formally incorporated on 20 May 1897.

A standard agreement between the two partners and the company dated 20 June 1897 confirmed that the company would purchase all the goodwill, trade names and trade marks, freehold premises and plant and machinery, stock, and all property in connection with the business. Cadett and Neall would continue to manufacture plates by a 'secret process known as Cadett's process' for which the consideration would be 60,000 shares in the company.

All shares were initially owned by the two families but Cadett and Neall resigned as permanent directors in 1903. The reason for this became apparent by 27 April 1904 when George Davison, the managing director of Kodak Ltd, become a director and a special resolution which was passed on 17 May was presented for filing by Kodak Ltd. By 1907 all shares in the company were held by Kodak through George Davison, George Eastman, Henry Strong and the Eastman Kodak Company. The following year the registered office of the company moved to Kodak's manufacturing plant in Headstone Drive, Wealdstone. The company was formally wound up on 28 November 1946.

Kodak's interest in Cadett and Neall Ltd lay not so much with the retail competition that the firm provided, although the popularity of it's plates and sales success would have been attractive, but in it's technical expertise in the mass-production of plates and film using Cadett's own machinery at a time when Kodak was looking to stifle competition in photographic manufacturing and to take-over competitors. Its approach in 1902 to take over Ilford Ltd had attracted bad publicity and had ultimately failed and Cadett and Neall Ltd offered a less high profile but significant business which could bolster Kodak's own manufacturing output and allow it an insight into its competitors in the sensitised goods business.

Following their departure from the business both Cadett and Neall appear to have had no further significant involvement in photography. Walter Neall had a new home designed by the architect Douglas G Round with a garden by Gertrude Jekyll between 1909–1911 in Guildford, Surrey. Cadett remained in Ashford.

MICHAEL PRITCHARD

See Also: Bromide Print; Eastman, George; Kodak; and Camera Design: 6 Kodak, (1888–1900).

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CAFFIN, CHARLES H. (1854–1918)

American art critic

Caffin was born in Sittingbourne, Kent, England on 4 June 1854 to Reverend Charles Smart Caffin, a Church of England minister and his wife Harriet. Both parents were skilful amateur artists and fostered a lifelong appreciation of art in their son. Caffin graduated from Pembroke College at Oxford University in 1877 and, following a stint as a teacher, turned to the stage. Caffin worked as an actor and manager with Ben Greet and His Shakespearean Players, an itinerant troupe offering outdoor plays. He married a fellow player, Caroline Scurfield, and immigrated to the United States in 1892. In America, Caffin found employment in the decorations department of the Columbian Exposition at Chicago where he painted mural decorations from the artists' designs. The fair celebrated the promise of a modern world and probably affirmed Caffin's belief that a new age requires a new art. After the fair, he made cartoons from artists' sketches for use by mural painters at the new Library of Congress in Washington, D.C. and used the experience to receive his first writing assignment. For the handbook published at the completion of the library, Caffin contributed a critical appreciation of art. He settled in New York in 1897, spending several years in Mamaroneck on Long Island, before moving to New York City by 1908. In 1897, Caffin also began his journalistic career and soon immersed himself in every aspect of the New York art world.

Although he frequently lectured, it is as a writer that Caffin made his mark. In an era when photographers battled for recognition as members of the art world, Caffin devoted his life to the belief that photography could be viewed as more than just the application of a mechanical recording device. Although credited as one of the most influential proponents of photography as art, Caffin began his writing career on the other side of the fence. As the new art critic for the *New York Post*, he entered the melee over the merits of photography with a scathing review of the 1898 Philadelphia Salon in *Harper's Weekly.* The subject of the attack, Alfred Stieglitz, met with Caffin and persuaded the critic to take a second look at his images. Convinced of the merits of photography, Caffin's subsequent writings reflected a changed attitude. He wrote time and again that photography could be practiced as a fine art since it requires the methods of other arts: sound technique, knowledge of formal principles and the ability of the artist to control the processes for the aim of personal expression. Caffin soon earned a reputation as a proponent of modern art and, especially, pictorial photography. He never explained his advocacy of photography, but he may have been influenced by the Arts and Crafts Movement theory that all products may be formed artistically. He clearly felt that the possibility of art exists in all human endeavors. Attacked by other critics for his tolerance, Caffin received praise from Stieglitz, a fellow member of the Photo-Secession society (later 291 group), who described him as the only art critic who was utterly honest and who took the trouble to look at every picture before making up his mind.

A highly moral and devoutly religious man, Caffin turned to art to find a rationale for these sentiments and later wrote that religion, morality, and art were inseparable aspects of a full life. It remained his conviction that an artist's character is revealed in his work and his criticism often involved comment on the artist as well as the art. He persistently denounced the efforts of some photographers to imitate other media, calling for a practice that would respect photographic properties and not seek to imitate painting. Caffin advocated "straight" photography, which values immediate effects with little or no manipulation of the print. He noted often that he was not a photographer and, since he lacked extensive knowledge of technical matters, he rarely commented on them. Caffin stayed with the *Post* until 1901, when he became the art critic for the rival *New York Sun.* He cemented his reputation as one of the most influential turn-of-the-century critics by serving as the art editor for two very influential magazines, *Harper's Weekly* and *International Studio*. He also found time to contribute pieces to two journals edited by Stieglitz, *Camera Notes* and *Camera Work*.

Although Caffin published many works on art, he produced only one book on photography and it is the work for which he is best remembered. *Photography as a Fine Art* (1901) first appeared in the form of a series of articles in *Everybody's Magazine* and *Camera Notes*. While Caffin's aim was to assert photography as an art independent of painting, his monograph includes important assessments of both photography and painting. He implied that both painting and photography have the same goals of harmony and beauty. Dismissing the objection that the camera is a mechanical device that prohibits artists from being inventive, he stated that every art has its limitations. The photographer overcomes this difficulty, Caffin wrote, by selection of the view and the moment of light and further control may be asserted in the developing and printing process. *Photography as a Fine Art* opens with a history of the photographic process and includes as illustrations photographs that made false claims to the rank of fine art. Caffin then reviews the work of progressives: Alfred Stieglitz, Gertrude Käsebier, Clarence H. White, Edward Steichen and others.

To boost the cause of photographers, Caffin frequently compared photography with painting. In the summer of 1905, he contributed "The Development of Photography in the United States" to *International Studio* for a special "Art in Photography" edition. In the article, Caffin suggested that the growth of American photography had been influenced by the success of American painting since the latter offered art as a means of personal expression while exploring the possibilities of the medium. In his 1913 book, *Art for Life's Sake*, Caffin asserted that photography confirms that mechanization may serve art and that an important consequence of photography has been the improvement of painting —more imaginative pictures have been produced. Caffin died in New York City on 15 January 1918.

Caryn E. Neumann

Biography

Charles Henry Caffin was born in Sittingbourne, Kent, England, on 4 June 1854 to Reverend Charles Smart Caffin, a Church of England minister, and Harriet C. Caffin. He attended Pembroke College, Oxford University, where he received his B.A. in 1877. Following graduation, Caffin taught for several years before joining an itinerant theater troupe, Ben Greet and His Shakespearean Players. Married in 1888 to actress Caroline Scurfield, the couple had two daughters, Donna and Freda. The Caffins immigrating to the United States in 1892 and Charles found work in Chicago with the Columbian Exposition. He then worked as a mural painter for the Library of Congress in Washington, D.C. in 1897. He published his first essay on art in Herbert Small's *Handbook of the New*

Library of Congress before moving to Mamaroneck, New York and entering the journalistic ranks. A prolific writer, he served three New York newspapers, *New York Evening Post* (1897–1900), *New York Sun* (1901–1904) and *New York American* (1913–1918). He also held the position of art critic for two influential publications, *Harper's Weekly* (1897–1901) and the American supplement to *International Studio* (1901–1905). His landmark article, "The New Photography," appeared in *Munsey's Magazine* (1902). Caffin wrote pieces on photography for *Century Magazine* and *Everybody's Magazine* while finding time to publish dozens of articles on other forms of art and to also lecture for clubs and school groups. A member of Photo-Secession (later 291 group) between 1908–1917, he wrote often for Alfred Stieglitz's *Camera Notes* and *Camera Work*. His 1901 book *Photography as a Fine Art* cemented him as the photographer's friend by portraying Photo-Secession as part of the modern art world. In 1905, he penned "The Development of Photography in the United States" for the art journal, *International Studio*. His art books include *American Masters of Painting* (1902) and *American Masters of Sculpture* (1903). *The Story of American Painting* appeared in 1907, followed by books on Dutch, Spanish and French painting. Caffin summarized his art theories in *Art for Life's Sake* (1913). *How to Study Pictures* (1905) may be Caffin's most influential work since it had wide distribution in schools throughout the country. He held membership in the National Arts Club. Active until the end, Caffin died on 15 January 1918 in New York City.

See Also: Stieglitz, Alfred; White, Clarence H.; and Steichen, Edward.

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CAIRE, NICHOLAS JOHN (1837–1918)

Australian photographer

Caire was born in Guernsey and probably arrived with his family in Adelaide, South Australia in 1858 aboard the *Bee*. Initially working as a hairdresser, he then trained in photography in Townsend Duryea's studio. In 1865 he travelled to the Gippsland district of Victoria photographing the aborigines and the landscape. In 1866 he opened a studio at 97 Hindley St, Adelaide producing carte-de-visite portraiture. In 1869 he moved to the Victorian goldfields, first working in Talbot then he opened a studio in View Place, Bendigo around 1872. In 1876 Caire took over Thomas Chuck's studio in the Royal Arcade, Melbourne, in 1878 he managed the (Anglo) Australasian Photo Co. at 57 Bourke St., East, Melbourne then he took over A. J. Davis' Bristol Portrait Rooms at 139 Bourke St. By 1880 he returned to his former location and opened the Royal Arcade Portrait Rooms producing carte-de-visite and cabinet photo portraiture. From 1884 he worked from his home in South Yarra. He made frequent tours of the countryside taking landscape photographs that were sold mounted on card or in albums. These had been his stock in trade since his arrival in Victoria and he was a great champion of the bush, even publishing a book with photographer J. W. Lindt "*Companion Guide to Healesville etc.*" in 1904.

Marcel Safier

CALDESI, LEONIDA (1823–1891) & MONTECCHI

London-domiciled Italian photographers

Leonida Caldesi was born in Florence, Italy in 1823 and arrived in England as a political refugee around 1850, though whether he was a photographer at this time is not clear. His brother Vincenzo (1817–1870) served as a major on the staff of the Italian patriot and revolutionary Giuseppe Garibaldi (1807–1882).

Comparatively little is known about Caldesi's career though he was one of the leading London photographers during the 1850s and was acknowledged by contemporaries as one of the foremost photographers of fine art from the 1850s to the 1870s. He had a number of short-term professional partners including Mattia Montecchi (1858–59), Blandford (1861–62) and Lombardi, though throughout his career he maintained a business relationship with the print publisher and art dealer Paul and Dominic Colnaghi. Caldesi had important dealings with the Royal Family as well as three major public art collections in London; The National Gallery, the British Museum and the South Kensington Museum. He also carried out society portraiture and worked for learned societies and private collectors.

In August 1854, probably as part of a project lead by Paul and Dominic Colnaghi, Caldesi had requested permission to photograph the Raphael Cartoons at Hampton Court though he did not carry out his campaign until 1858 when he photographed in tandem with the South Kensington Museum's photographer Charles Thurston Thompson [qv].

1857 was probably the most important year in Caldesi's photographic career. In May Caldesi and his

professional partner Mattia Montecchi, a compatriot who travelled to England with him, were summoned to Osborne on the Isle of Wight to take a series of photographs of the Royal children. His growing reputation was sufficient for him to be established in April on the premises of P&D Colnaghi by John Scott, one of the firms' partners, and by June 1857 this establishment was noted in the columns of the *Art-Journal*. Colnaghi was to remain the primary publisher of Caldesi's reproductions of works of art.

Although Caldesi specialised in the photographic reproduction of works of art, his core business was centred on society portraiture and he exhibited several of these at that year's Art Treasures exhibition in Manchester. Caldesi and Montecchi also were engaged to photograph many of the paintings exhibited at this seminal exhibition. Alongside Robert Howlett [qv], they produced the majority of the 200 photographs for the two-volume 'Ancient' and 'Modern' series of *Photographs of the Gems of the Art Treasures Exhibition, Manchester*. Caldesi found difficulty in photographing some of the paintings in Manchester and successfully negotiated with the Royal Collection for some of its works to be subsequently moved outdoors to be photographed.

In the summer of 1857 Caldesi and Montecchi photographed a smaller exhibition of portraits of Mary, Queen of Scots held at the Archaeological Institute, London. Theseat were published in 1858.

In 1859 *The Gallery of the Most Noble The Marquess of Hertford, K.G.,* a selection of Caldesi's photographs from the Manchester exhibition, was published. At that year's exhibition of the Société française de Photographie Caldesi and Montecchi exhibited twenty-one photographs of paintings displayed at the 1857 Manchester Art Treasures.

Caldesi advertised a studio at Porchester Terrace in London's Bayswater and he began carrying out photographic work for Prince Albert's Raphael Collection project. Perhaps as a result of this commission, Caldesi recorded the paintings in Buckingham Palace and was given permission to remove them to his studio. These photographs were published by P&D Colnaghi as the *Royal Collection of Pictures at Buckingham Palace*, and comprised forty small Albumen prints mounted on cards with printed captions that credit Caldesi, Blandford & Co. as the photographers, Montecchi having disappeared from the scene. This publication may bear the hand of the Prince Consort. Caldesi received further royal patronage that year when he was commissioned by Grand Duchess Marie of Russia to photograph the Elgin Marbles in the British Museum and he exhibited some of these views the following year at the Photographic Society's exhibition in London.

Caldesi advertised in the influential *Athenæum* in the early 1860s stating that he personally took carte de visite portraits at 13 Pall Mall East, the Colnaghi premises, while 'portraits, Carriages, Horses, &c.' were taken at the branch studio at 6 Victoria Grove, Kensington. He photographed a number of prominent people including Sir Charles Eastlake, director of the National Gallery. In 1864 Caldesi published carte de viste portraits Giuseppe Garibaldi and his fellow patriot Giuseppe Mazzini (1805–1872) during their visits to London.

During the 1860s Caldesi also produced cartes de visites of paintings though it appears that he did not use the stereoscopic or Cabinet formats to any significant degree.

In 1860 Caldesi carried out a photographic campaign in the National Gallery in London, exhibiting some these photographs of paintings at the 1861 exhibition of the Société française de Photographie. Between 1868 and 1873 *The Pictures by the Old Masters in The National Gallery*, a series of photographs of 360 paintings, was published by Virtue & Company. At this time Caldesi photographed a number of paintings in the Gallery on behalf of the director Sir William Boxall (1800–1879).

During the 1860s Caldesi was to carry out photographic campaigns to record important private art collections such as the Farnley Hall collection of drawings by J.M.W. Turner These photographs, published by Colnaghi in 1864, seem to have had little impact and were not reviewed by the contemporary press. Another Colnaghi publication of 1864 was the *Photographic Historical Portrait Gallery,* which required Caldesi to photograph just under 200 Albumen prints of Tudor portrait miniatures.

An account of the latter years of Caldesi's life has yet to be assembled. *Photographs by Cave. Leonida Caldesi, of Ancient Marbles, Bronzes, Terracottas, & C, & C. in the British Museum* was jointly published with Colnaghi's between 1873–1874 but the photographs may have been taken some years before. Caldesi appears to have returned to Bologna in around 1870 and died there in 1891.

ANTHONY HAMBER

See Also: Colnaghi, Paul and Dominic; Société française de Photographie; and Cartes-de-Visite.

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CALOTYPE AND TALBOTYPE

On February 8, 1841, William Henry Fox Talbot (1800–1877) patented a paper negative process he christened the calotype. The process revolutionized photography by introducing two substantive improvements: it greatly reduced exposure length, in some cases by a factor of more then one hundred, and secondly, it yielded a chemically robust negative capable of enduring repeated contact printing for positive copies.

The evolution of photography until this moment had been significant but rudimentary. Thomas Wedgwood (1771–1805) in 1802 was the first to conceptualize and create images with photosensitive silver salts. But no one, including Wedgwood, had cracked the code for fixation: captured images inevitably faded from the presence of chemically reactive compounds in the paper. By 1839, two novel photographic systems on paper demonstrated significant gains in photochemical stability. The first was Talbot's photogenic drawing, the second by Hippolyte Bayard (1801–1887), was the lesser-known direct paper positive. But both required lengthy exposures, yielded delicately delineated images and were subject to fading despite their improved durability. The daguerreotype was a third process known at this time; it produced a clear and bright silver amalgam image on a silver plate and its mirror-like detail captured the imagination of everyone who saw one. Like the direct paper positive, it produced a unique object.

The fledgling photogenic drawing process was hailed by many but was also heavily criticized, especially when compared to the extraordinary images rendered by the daguerreotype. Talbot had also not been fully satisfied with the photogenic drawing and he continued his research. On September 20, 1840, while searching for ways to increase its sensitively, he made a pivotal discovery.

> I had been trying pieces of sensitive paper, prepared in different ways, in the camera obscura, allowing them to remain there only for a very short time, with a view of finding out which was the most sensitive. One of these papers was taken out and examined by candlelight. There was little or nothing to be seen upon it, and I left it lying on a table in a dark room. Returning some time after I took up the paper, and was very much surprised to see upon it a distinct picture. I was certain that there was nothing of the kind when I had looked at it before, and, therefore (magic apart), the only conclusion that could be drawn was that the picture had unexpectedly developed itself by a spontaneous action. (*Literary Gazette*)

Talbot immediately retraced his steps and realized that papers given only a brief exposure to light could be further developed with gallic acid. Sir John Herschel and the Reverend John B. Reade were also aware of the ability of gallic acid to act as developing agent (see Schaaf 1992 and Wood, 1980 for a thorough description of these historic events). Until this time, the presence of the latent image was not known and the sun acted as the developing agent. Images were created by placing a flat, thin object (such as a piece of lace or botanical specimen) in close contact with a sensitized sheet of paper and exposing directly to sunlight. A photochemical reaction occurs in the sensitized sheet and the portions unprotected by the specimen turn rich, purple and red toned hues. The longer the exposure, the darker the image, but achieving this richness could take an hour or more. This is called the printing-out process, and is the basis of photogenic drawings, salted paper prints, and many other photographic processes. These processes, were, however, used primarily to create positive images, and at the time were called "transfers" or "copies."

The word "calotype" originates from the Greek *kalos* and *typus* meaning "beautiful image." In the 20th century, it came to be used as a general term for positive prints from paper negatives, but it is recommended that the meaning remain faithful to Talbot's original definition, that of a paper negative. The calotype was never used to directly make positive prints, largely because the image tonality did not yield the beautiful colors offered by the printing-out process. Shortly after its creation, another term for calotype, "Talbotype," was promoted by many of the inventor's supporters. It appears in the literature, patents and Talbot's commercial printing and publishing establishments in Reading and London. Because many photographers modified Talbot's formula to suit their individual needs, the term calotype specifically refers only to Talbot's patent process. The many other paper processes, whether developments from Talbot's process, or from (sometimes serendipitous) discoveries made while trying to improve it, are not calotypes. The distinctions between 'calotype,' 'plain paper,' 'waxed paper,' et cetera were clearly understood in Victorian time.

The photographic image is created through the light sensitivity of silver halides, the chemical amplification of the latent image and the removal of unexposed silver halides from the paper with a fixing agent. The final image silver is attached to the paper fibers, literally imbedded within their matrix. The five essential components of the paper negative process are the paper substrate, sensitizing chemistry, developer, fixer and post processing alterations. Each of these components is applied and combined by hand and thus subject to any number of subtle variations that alter its physical character. The final result is a sheet of high quality paper with a neutral gray image in reversed values: highlights in the original subject appear as dark image areas, while the shadows of the subject appear in increasingly lighter tones on the paper, the deepest shadows translate as pure paper. For example, if the image captured was a bright outdoor scene, the negative will appear very dark over-

all. Because the paper support is partially opaque, the negatives do not need to be viewed through transmitted light to see an image.

The nineteenth century photographer considered the paper substrate to be the most important component of the calotype. It's physical properties and characteristics translated directly into the negative's final appearance, and thus into any prints made from it. Dimensions varied from 2 × 2" to greater than 15 ×18", the size being directly proportional to the capacity of the camera. From exquisitely thin to stout and thick, the photographers explored a wide range of papers. Wove papers were preferred to laid and chain papers, and even water marks were trimmed away, since they would be visible in the image and print. Thin, uniform papers yielded a crisper image, while a thick, fibrous paper a softer effect. Greater or lesser absorption properties in a paper created denser or more ethereal tones. Sizing affected the outcome as well, from fine gelatin sized English papers which yielded warmer tones, to the cooler tones of the starch sized French and German papers. Finally, the purity of these papers was paramount. Uneven distribution of the size in the pulp could result in a mottled image. Any fillers or impurities such as bits of metal or other inorganic contaminants could create uneven results, even spots or stains.

Locating a reliable source for paper of suitable quality proved difficult and troublesome before mid century. Industrialization of mechanical printing and paper making in the 1820s claimed the lion's share of available cotton and linen rags, making handmade papers less available and more expensive. The new photographers required the greater quantities that mass production provided, but of a consistently superior quality not readily available from the average paper mill. Between 1843 and 1853 the three most frequently recommended papers for the calotype were Whatman, Turner and Canson. After 1852, qualified paper makers were persuaded to create a "niche market" for photographic papers. An important milestone came from the Chafford Mills in Kent that produced the paper watermarked "RTurner Patent Talbotytpe." The paper was highly regarded for it's even texture, consistent production quality and longevity and used by many practitioners such as Benjamin Bracknell Turner (1815-1894). From 1853 and continuing well into the 1860s, increasing paper selections were available by Turner, Whatman, Canson, Sanford, Papier Saxe, Hollingsworth, Papier Rive and Towgoods. There was also variety in preparation, from plain to gelatinized to iodized, in an effort to simplify the steps and encourage purchases. Given the demand for such high quality stock, surviving negatives are often in excellent condition. Apart from mechanical wear, such as tears, creases and skinning, the paper remains supple and if properly processed, will retain clear, bright highlights. Usually the paper is a natural cream color, although negatives exist on papers tinted with bluing agents.

Sensitization takes place in two steps. First the paper is "iodized" by applying a halide salt solution usually potassium iodide and a smaller proportion of silver nitrate. In the second step, just before use, the iodized paper is coated with gallic acid and silver nitrate. If the solutions are lightly brushed onto the paper, the resulting silver image layer may be thin to moderate. Alternatively, if the paper is immersed, floated or repeatedly coated, it will absorb a maximum amount of solution potentially resulting in a dense image, printing through to the verso from this saturation.

In-camera exposures could range from 30 seconds to six minutes or longer, depending on conditions. During exposure, the latent image is created: atom-size irregularities or flaws inherent to silver halide crystals will condense after irradiation from light. Even a brief exposure is enough for the condensed irregularities to become sensitivity specks, which in turn become the points of attack for chemical development. Alternatively, if the sensitized paper is continually exposed to light, the latent image will visibly print out and can eventually completely blacken the paper.

The calotype developer was gallic acid and silver nitrate. A component found in nutgall, mangoes and other vegetable matter, gallic acid has a strong chemical affinity to the halides. The image development in paper negatives is different from the image forming in salted paper prints and albumen prints which are printing-out processes. It is called physical development, and in it, the developing agent (gallic acid) donates electrons to the silver ions in solution (from the silver nitrate) so that metallic silver is deposited at the site of the latent image. This coating or plating of the latent image amplifies until the image reaches visible size. Its spherical morphology and size dictates the particle's reflective properties and chemical robustness, and a well-processed image will appear neutral gray. The temperature and purity of the developing solution and washing baths were identified as important variables because the rate of chemical reaction increases when temperature rises and impurities could react with the chemistry. Technical difficulties such as over- and underexposure were compensated for with under-and over development, much as they are now.

The image was stabilized by removing unexposed halides by washing with either potassium bromide or sodium thiosulphate, then known as "hyposulfite of soda." Talbot initially preferred potassium bromide. John Herschel discovered the ability of the thiosulphates to dissolve the insoluble salts of silver chloride in 1819 and was the first to use the compound in photography. Eventually sodium thiosulphate became the standard chemical fixer, although improper use resulted in acute staining and fading and the loss of many early photo-

graphs. As sited by Ware (1994), there should be distinct yellow high values indicative of the presence of silver iodide after potassium bromide fixation. This striking characteristic is present in the negatives held in the *National Portrait Gallery of Scotland* by the Scottish team, Robert Adamson (1821–1848) and David Octavius Hill (1802–1870) who produced an outstanding body of work.

With impressive raw talent and skill in the arts and sciences, the first photographers brought a wealth of materials, technical expertise and finesse to the new art form. Nowhere is this more evident than in the post-processing treatment and preparation for printing. Negatives could be altered for printing in a number of ways: retouching, masking, trimming, inscribing, use of tabs for handling and wafers for affixing sheets for printing, coating, re-fixing or chemical intensification.

One of the most dramatic modifications to the paper negative was saturating the paper with wax, resin or oil, rendering the substrate more translucent. When viewed under normal illumination, the paper can appear waxy, shiny with yellow or orange tones overall. Creases appear as opaque lines and the paper itself may feel heavier. When the same negative is viewed through transmitted light, however, the highlights blossom, causing details to appear crisp and clear. Beeswax was a familiar and well-known material to 19th-century artists and was the primary material for waxing paper negatives. Numerous methods existed for preparing waxed tracing papers such as sprinkling grated wax onto paper and warming with an iron or immersing the paper in a shallow tub of molten wax. Excess wax could be removed by placing the paper between blotters and warming with an iron. Experiments using oils, gums and resins were also reported in the photographic literature, although the rare examples in extant collections of negatives suggest their use was not widespread.

The narrow range of latitude and strong contrasts of paper negatives could be reduced or enhanced by waxing which enhanced the translucency and shortened printing time by applying media such as graphite powder or pigmented washes, by ironing the paper or by selective coating portions of the image with additional transparentizing agents. Similarly, flaws were retouched and image details could be outlined with these same materials. Many photographers inscribed their negatives with information, ranging from dates or numbers, to extensive descriptive text. Perhaps the ultimate modification was post processing chemical treatment by refixing or image intensification and is an example of how close dark room procedures of the 19th century are to those of silver halide photography in the 21st century.

Each formulation described above was subject to adaptation by devotees, and often the variant was identified by name as a separate method, such as "plain paper process" or "wet paper process." In 1856, Sparling lists six calotype formulas by photographer's name. Typically, changes were made by adjusting or adding chemical constituents, organic components (including gelatin, albumin, collodion, and sugar), by altering the temperatures of processing baths, even by exposing the paper negative while damp. After the introduction of the waxed paper negative process in 1851 by Gustave LeGray (1820–1882), a French encyclopedia (Blanchère, 1865) lists no less then 44 paper negatives processes, most of which are close variants of either the calotype or the waxed paper negative process.

Travelling photographers from the West were quick to exploit the advantages of the paper negative and many hundreds survive documenting places as far away as the Holy Land and the Orient. Subjects in all formats included regional architecture, local people and costumes, scenes, views, and documentation of scientific specimens. Shorter exposures and assembly of familiar materials appealed to the early travelling photographers. The daguerreotype could not compare to the paper negative's lightweight ease and flexibility, especially in extreme climates. Photographers of the 1850s modified their processes when travelling in hot, arid zones where unexposed, sensitized negative papers would easily spoil. A notable example is the aforementioned "wet paper process" whereby the sheets are iodized the night before, fully sensitized the next morning and placed into the negative frame while damp. Exposure and processing must occur within 24 hours. Each of the halides (chloride, bromide and iodide) have different reactivity rates, and the sensitizing solution was adjusted by changing their ratio. After Irishman John Shaw Smith (1811–1873) traveled in the Middle East between 1850 and 1852, he read his formulations to the Dublin Photographic Society,

> When the temperatures rose above 85, these papers would not keep during the day, they became spotted. This difficulty I overcame as follows: -an iodizing bath was prepared similar to the last mentioned, only leaving out the solid iodine and substituting as follows:- four drops of 'bromure d'iode'' were added to the bath, … the effect of this addition of the 'bromure,' while it nearly doubled the required time of exposure in the camera, was, to cause the papers prepared to keep well during the whole day, under the highest temperatures, the papers being excited in the morning and developed the same evening." (*Journal of the Photographic Society*, April 21, 1857)

The calotype united photography and the printed word. Daguerreotypes could never be realistically included in multiple book editions, nor could the fragile photogenic drawing process withstand the rigors of printing. But many dozens of positive prints could be produced from a single calotype. The first photographically illustrated book was the Pencil of Nature, with a

total of twenty-four tipped-in salted paper prints from calotypes. The work was published by Talbot and released as a limited edition in six installments between 1844 and 1846.

The paper negative process was passionately practiced by a devoted group of practitioners from 1841–1860s, some of who brought the art to it's highest achievement. In addition, there were at least three hundred amateurs who embraced the calotype as their process of choice in the 1850s. In addition to those mentioned above, interesting and important early work exists by Talbot's relative, Welshman Rev. Calvert Richard Jones (1804–1877). The French excelled in the process, among the leaders Hippolyte Bayard, Maxime DuCamp (1822–1894), Eduard-Denis Baldus (1815–1882), and Louis-Désiré Blanquart Evrard (1802–1872). The Philadelphia daguerreotype studio of Fredrick (1809–1897) and William Langenheim (1807–1874) are virtually the only known examples of Americans practicing the art.

The calotype reached its apex in the late 1850s, side by side with its sister process, Le Gray's waxed paper negative. At that time there were three equal pillars of photography: the daguerreotype, paper negative photography, and glass plate photography (collodion and albumen). But however fine and delicate, the details of paper negatives were never as sharp as the glass plate negative, to which it was constantly compared. Increasingly, the fibrous softening of the optical edge was seen as a drawback. In 1863 papers for the calotype were still readily available by photographic suppliers, but the direction of photography was moving towards the glass plate negative and its complement, the albumen silver print. Despite brief revivals in the 1900s and 1920s, by 1870 the golden era of the calotype had come to an end.

LEE ANN DAFFNER

See Also: Talbot, William Henry Fox; Photogenic Drawing Negative; and Latent Image.

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CAMERA ACCESSORIES

The original daguerreotype apparatus was manufactured for Louis Daguerre by Alphonse Giroux of Paris in 1839 was offered as a complete outfit—everything the aspiring photographer needed except plates and chemicals was included. The outfit weighed over 45 kilos, and the camera could be used successfully without any additional accessories.

As the art and science of photography matured, however, a range of additions and accessories were introduced to improve the reliability and repeatability of the procedures.

Tripods and Camera Supports

The earliest cameras were operated on tables or any other usable support, but camera stands or tripods were included in many complete outfits. Initially, they were of fixed height, chosen to give the operator a comfortable working position.

Adjustable camera stands were introduced before 1850, and by 1853 advertisements offered both fixed and adjustable height tripods, and camera stands embodying either rack or screw height adjustments. The adjustable tripod was inspired by the quest for lighter, collapsible, and easily transportable equipment as photography was taken out into the landscape. Folding tripods and collapsible darktents were included in many designs for a photographer's backpack.

Even the earliest tripod designs featured a hinged camera platform, allowing the elevation of the camera to be adjusted upwards or downwards as required.

Plate, Paper and Film Holders

The earliest removable camera accessory was the plate holder or dark-slide, frequently referred to in early literature as the "plate shield." In Daguerre's original specification, the metal plate was affixed to a wooden board—the plate holder or frame—with four small metal bands, an operation which required a hammer and small nails, before being inserted into the plate shield for transfer to the camera. In later modifications of this design, the plate was held firmly in the holder by four small corner plates, considerably reducing both the risk of damage to the plate surface, and the loading and unloading time.

William Henry Fox Talbot's specification in his 1841 calotype patent—No. 8842 Obtaining Photographic Pictures—required the sensitized paper to be "defended from the light" while being placed in the camera, and early calotype cameras were supplied with paper holders either with a removable "screen" or a system of light-tight doors. As the calotype could be used while still damp, the holder had a flat surface, often glass, against which the (moist) sensitized paper could be held easily.

In some designs of double-sided holders two sheets of paper, separated only by a sheet of blotting paper, were held flat between two sheets of glass, and exposed through the glass. In later examples the glass was dispensed with, and the paper was held flat on a board by a series of calico strips which also determined the boundaries of the image area.

Designs for holders for wet collodion glass plates often included a ceramic trough to catch any residual chemicals which might drain off the still moist plate surface.

By the early 1850s, plate shields with multiple inserts facilitated the use of a variety of plate sizes in a large camera.

As the wet collodion plate had to be coated and exposed immediately before use, holders for that process needed only be single-sided. Double plate holders did not enter into common usage until the advent of the commercially produced dry plate in the 1870s.

The popularity of the waxed paper process in the early 1850s, permitting negative papers to be sensitized days or even weeks before exposure, resulted in the first example of a roll-holder, enabling the photographer to make several exposures without reloading the camera. Designed in England by Arthur Melhuish and Joseph Spencer (Provisional Patent No. 1139 1854), the holder was loaded with several sheets of waxed paper which had been taped together to make a continuous roll. In 1855, Humbert de Molard designed a roll-holder which was loaded by taping several sheets of plain or waxed paper to a roll of silk. Camille Silvy's 1867 roll-holder introduced an early version of a light-tight cassette, and in 1870 also included a leader of yellow silk to protect the unexposed sensitised negative paper from accidental exposure to light.

The first roll-holder to accommodate film was introduced by Leon Warnerke in 1875, for collodion stripping film. The introduction in 1884 of the Eastman Roll Holder, as an accessory for dry plate cameras, marked the first such device to enjoy commercial success, its popularity being enhanced by the fact that it could be customized to fit many cameras.

Holders capable of exposing several separate sheets of paper without reloading were introduced in 1853, an example being the design of G. Montefiore Levi, which could carry up to fifteen waxed paper negatives.

In the dry plate era, multiple plate holders were introduced enabling several exposures to be made without reloading.

The changing box performed a similar function, but away from the camera. Thomas Ottewill's 1870 design which held eighteen plates was one of the first, although George Hare's 1875 design for twelve plates, available in a range of formats, was the more popular.

Shutters

With the long exposures required with early materials, shutters were initially unnecessary. Daguerre's original camera was fitted with a swivel plate to uncover and cover the lens, whereas a later design by Lerebours utilised a black cloth for the same purpose. Calotype and early wet plate cameras used a simple lens cap. As the sensitivity of materials increased, the accessory shutter, which could be fitted to an existing camera or lens was introduced.

The first roller-blind shutter capable of giving repeatable instantaneous exposures was demonstrated by W. H. Cooke in 1853. It fitted over the front of the lens and replaced the lens cap. Later designs were fitted between the lens and the lens panel, but retained the basic principles of Cooke's design. The Kershaw Instantaneous shutter of 1885 and the Thornton-Pickard Time & Instant shutter of 1888 were both popular patented designs. Pneumatic shutters extended the range of shutter speeds available from the early 1890s, but by the end of the century, the majority of lens designs incorporated an internal shutter.

Interchangeable Lenses

Few sliding box cameras were designed to accommodate more than one focal length of lens, but an early example to offer such a facility was the full-plate daguerreotype camera introduced by Pierre-Ambroise Richebourg about 1842. With the extended focussing range of later bellows cameras, the interchangeable lens panel became a much more available option. An early example of a bellows camera offering this feature was introduced by

Andrew Ross in 1850. John Henry Dallmeyer's 1862 camera could be operated with a single portrait lens and panel, or with binocular lenses for stereoscopic photography. From the 1860s, the interchangeable lens panel was a universal feature of bellows camera design.

JOHN HANNAVY

See Also: Lenses: 1. 1830s–1850s; Camera Design: 1 (1830–1840); Camera Design: 2 (1850); Daguerreotype; Daguerre, Louis-Jacques-Mandé; Giroux, André; Talbot, William Henry Fox; Calotype and Talbotype; Waxed Paper Negative Processes; Silvy, Camille; Warnerke, Leon; Eastman, George; Ottewill, Thomas & Co.; Hare, George; Lemercier, Lerebours & Bareswill; Richebourg, Pierre-Ambroise; Dallmeyer, John Henry and Thomas Ross.

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CAMERA DESIGN: 1 (1830–1840)

The camera obscura was used by the earlier experimenters as the first photographic camera to produce images using light-sensitive chemicals on a paper or metal support. Thomas Wedgwood and Humphrey Davy circa 1801 used one to expose sensitised paper with limited success. Davy reported in the *Journals of the Royal Institution* in 22 June 1802 that 'the images formed by means of a camera obscura have been found too faint to produce, in any moderate time, an effect.' Joseph Nicéphore Niépce in 1816 also using a camera obscura was able to produce images but had no means to fix them. Daguerre, continuing Niépce's work, carried on using the camera obscura in the development of his own process.

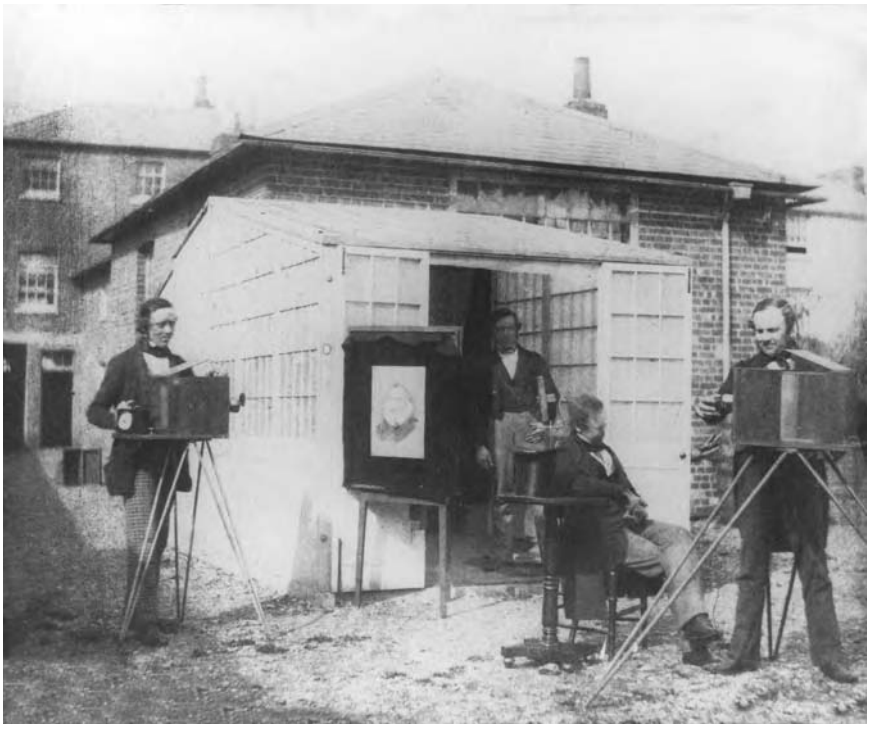
William Henry Fox Talbot in late 1834 or early 1835 also made use of a camera obscura to expose his sensitised paper but found that the exposure was too long to make a strong impression. In the summer of 1835 Talbot had more success using new chemistry and a camera obscura made from a small box and produced the well-known Lattice Window image of August 1835. Talbot also made use of a solar microscope to make images.

Niépce and Talbot also made use of the first purpose built photographic cameras. Niépce, for his experiments using bitumen-coated pewter plates, constructed cameras in the form of a plain box and with two boxes sliding within each other—a design that was resurrected and became popular in the 1850s. These designs offered rigidity, a means of securing the plate, a fixing for the lens and a size that was more appropriate to the optics then available. These two forms of camera were based on typical camera obscura designs.

Talbot also made himself or had constructed small boxes for the purposes of making photogenic drawings. Reputedly these were made by the village carpenter in Lacock but Arnold argues that their crude construction would suggest that they were made by Talbot himself. These crude wood boxes were briefly described by Constance Talbot as 'mousetraps,' a name that has endured. The cameras were no more than 2 or 3 inch cubes with a simple brass bound lens at one end and a back to which sensitised paper was pinned. Later versions of the cameras were better constructed with refinements such as a viewing hole to examine the progress of exposure and detachable plate holders.

The announcement of Daguerre's process on 7 January 1839 and Talbot's photogenic drawing process on 25 January 1839 provided the catalyst for commercial manufacture of photographic cameras. Daguerre's relative by marriage Alphonse Giroux of Paris launched a sliding box daguerreotype camera designed by Daguerre. The camera was to make daguerreotype plates up to 16.5 × 21.5cm., which became known a whole-plate, and had a lens from Chevalier at a cost of 400 francs. It was available from 21 August 1839 the day of the public disclosure of Daguerre's process. Giroux had signed a contract with Daguerre for the sole right to make daguerreotype apparatus under Daguerre's direction. The camera bore a seal on one side featuring Daguerre's signature and was the first commercially manufactured camera.

Other manufacturers soon produced their own designs of camera. Charles Chevalier of Paris produced a collapsible box form camera that offered a degree of portability limited only by the accompanying processing apparatus that was required to be carried. Alexis Gaudin designed a box form camera manufactured by N. P. Lerebours in 1841 for 7 × 8 cm. daguerreotype plates. The camera was contained with all its associated chemicals and processing equipment in a box. In America by 1842 John Plumbe had produced a sliding box camera copied from Daguerre's original design for 2¼ × 3¼ inch plates. The camera may have been constructed for Plumbe by a Boston scientific instrument maker. In the later 1840s what became known as the American-pattern of boxform camera with chamfered front edges became popular although there is some evidence that this design had been copied from an 1840 design by Chevalier.



Henneman. The Reading Establishment.
The Metropolitan Museum of Art, Gilman Collection, Gift of The Howard Gilman Foundation, 2005 (2005.100.171ab(a)) Image © The Metropolitan Museum of Art.

In Britain from February 1839 Talbot began purchasing cameras, mainly from the London lens and instrument maker Andrew Ross. In 1839 this included three camera obscuras, a solar microscope and one experimental camera with four lenses. Ross supplied seven cameras in 1840–41 and another instrument maker Watkins and Hill of London supplied a camera and ancilliary equipment. Talbot also purchased cameras from France.

In Germany the firm of Voigtländer made an all-brass camera incorporating a four-element lens designed by Max Petzval in 1841. The camera was shaped like a cannon and was set on a brass stand. Plates were held in a separate metal holder and gave images of 3.7 inches diameter. Carl von Steinheil also designed a tubular camera for paper or daguerreotype plates.

The first patent for a photographic camera was Alexander S. Wolcott's camera for the daguerreotype process which was patented in America on 8 May 1840 and in Britain by Richard Beard under British patent number 8546 of 13 June 1840. The boxform camera body made use of a concave mirror set at the back of the camera to reflect the image on to the plate. Antoine Claudet on 18 December 1841 patented the first camera with interchangeable lenses for plates of different sizes and processing taking place within the camera body.

The basic design of camera up to 1850 was the rigid or collapsible box form camera or the sliding box camera with two or three sections sliding within each other. Within this basic design there were continual improvements. Willat's *Manual* of 1845 shows a camera with a handle and threaded rod running through the baseboard to move the rear box for focusing. The camera also had different positions for the darkslide and focusing screen within the body of the camera, to allow for lenses for different focal length.

Most cameras of this period seemed to have been designed for daguerreotype use, although by the later 1840s manufacturers were usually describing them as being suitable for paper, glass or daguerreotype processes. In 1845 George Knight and Sons advertised Cundall's Calotype camera that had first been described in May 1844 in the *Philosophical Magazine*. The camera was of the sliding box type but without a baseboard but was important as it had a focusing scale, internal baffles to reduce light reflections inside the camera and a lens with lens hood.

Cameras were made in a variety of plate sizes with five standard French sizes and four English sizes which had reduced to seven sizes by the end of the 1840s. Most cameras were made by established optical or philosophical instrument makers with the British maker's favouring mahogany or rosewood and lacquered-brass and continental Europe maker's favouring walnut and unlacquered brass construction.

MICHAEL PRITCHARD

See Also: Wedgwood, Thomas; Niépce, Joseph Nicéphore; Davy, Sir Humphry; Talbot, William Henry Fox; Daguerre, Louis-Jacques-Mandé; Daguerreotype; and Calotype and Talbotype

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CAMERA DESIGN: 2 (1850)

Although Smith has argued that the patents of Daguerre in Britain and Talbot held back the development of new and innovative designs of cameras during the 1840s there were equally few developments elsewhere in Europe or America. The 1850s saw the development of specialist photographic manufacturers, the development of more sensitive and easier processes and a rise in amateur and professional photography which probably did more to stimulate new designs of camera. The predominant boxform designs of the 1840s lasted through the 1850s and beyond, but they were joined by new designs, smaller and more specialist cameras.

Folding cameras were not new but new designs appeared. Bland and Long of London produced a design for paper processes and a similar design was registered by Ottewill on 25 May 1853. Hinges in the centre of the box allowed the camera to collapse in on itself once the lens panel and focusing screen were removed. Other makers copied or adapted the design. At the 1851 Great Exhibition Richard Willats showed a prototype of a collapsible camera that had a black cloth body. In America W. and W. H. Lewis of New York introduced cameras using square-cornered bellows to a design patented on 11 November 1851. Although their design was intended to give extra extension and made the camera suitable for copying purposes the idea of using bellows to make a compact camera gained favour.

Major Halkett showed a camera to the Photographic Society in April 1853 that used unpleated rubber to connect the lens standard to the back standard. Other designs of cameras using cloth, or bag bellows, continued to be shown. British provisional patent number 1295 of 31 May 1856 granted to Francis Fowke described a folding bellows camera with bellows between the front and back and this design in a modified form was made by P. Meagher and quickly established itself as a standard design for later improvement. The most influential collapsible bellows camera was designed by C. G. H. Kinnear of Edinburgh in 1857. The camera made use of tapered bellows which gave greater compactness. The designed was taken up by many camera makers. These two bellows designs were refined and remained in production into the twentieth century.

During the decade the rising and lateral moving front panel holding the lens was also added to boxform cameras. In most cases the movement was allowed by a simply cut-out in the lens panel which allowed a screw to be secured to the camera body. The effect of the small movement permitted was limited. Other cameras permitted in the entire lens panel to move in one direction only with only the protruding back of the lens limited movement. More mechanical and precise controls using a rack and pinion or adjustable supports did not enter camera design until later in the century.

The retention of sensitised materials in the camera were wholly held in removable holders which slotted into the back of the camera. Wet collodion glass plates were usually retained with small wire clips at their corners and one plate fitted each holder. As dry plates became more common holders containing two plates separated by a metal sheath allowed for more compact outfits to be made.

Cameras which allowed the photographer to process his plates inside the body of the camera also saw some popularity throughout the 1850s. Their designers saw internal processing as a way of reducing the size and weight of the apparatus the travelling photographer needed to carry. Henry Talbot patented the first design in 1851 and Archer's portable camera of 1853 was widely discussed and over twenty British patents were granted for such cameras over the next thirty years.

The 1850s saw the rise of interest in stereo-photography and camera were made to reflect this. There were two methods of producing stereo pairs of photographs. The first was to make two separate images with one camera with a variety of methods employed to ensure the correct spacing between the two pictures. The second was to construct a camera with two lenses that took the pictures at the same time.

The first significant design was shown by Latimer Clark to the Photographic Society on 5 May 1853. A single camera was mounted on a jointed parallelogram that moved the camera a set distance between exposures. A pulley system moved the plate holder so that the second exposure could be made quickly. Other designs moved the camera across a bar which was fixed to a tripod and John Harrison Powell's design registered on 27 December 1858 and made by Horne and Thornthwaite moved the camera across a box and it's lid which also contained the camera and plate holders. A third method shown by John Spencer in 1854 moved the lens across the front of the camera and had an internal septum to divide the camera so the two photographs did not overlap. Two cameras placed side by side would also achieve the same effect and was described in British provisional patent number 1629 of 8 July 1853.

The first twin lens stereoscopic camera was demonstrated in October 1853 to the Liverpool Photographic

Society and the first binocular boxform camera was offered for sale by J B Dancer of Manchester. His design was patented in September 1856 and was a more advanced design of one made in 1853. The camera incorporated a number of innovations. The first folding bellows stereoscopic camera was George Hare's Portable Binocular camera of 1860. Other designs followed until interest in stereoscopy waned before a resurgence of interest in the 1890s.

Throughout the 1850s cameras continued to be made from wood. The first metal-body folding camera was described by A J Melhuish in two patents in 1859. A single and stereoscopic version were described and one example of the single lens version is now in the National Museum of Photography, Film and Television, UK. Melhuish was also responsible for a roll-holder for paper negatives which had been designed in 1854.

Various patents were published describing cameras that allowed processing to be undertaken internally and specialised cameras for, for example, panoramic photography were also made and different styles of photography became possible through the development of new processes. Cameras designed for enlarging or copying were announced by the late 1850s. Despite the many significant camera designs during the decade relatively few were patented with the more successful innovations being copied and refined by different manufacturers.

MICHAEL PRITCHARD

See Also: Daguerre, Louis-Jacques-Mandé; Talbot, William Henry Fox; Thomas Ottewill & Co.; and Wet Collodion Process.

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CAMERA DESIGN: 3 (1860s–1870)

The main theme for camera design during the 1860s and 1870s continued to be portability and the general improvement of existing designs of camera. During the later part of the period there was an increasing separation between professional studio and amateur cameras with latter generally being more innovative.

In 1861 F. R. Window described a new arrangement of the long-established sliding box camera. The smaller inner box was moved to the front of the camera and carried the lens and was focused by a double rack and pinion mechanism for moving the front box on a base-

Ponti, Carlo. Megalethoscope.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

board. The design was more compact, more rigid and easier to focus. Window's design remained popular and in revised forms were popular into the twentieth century. Most later hand and field cameras retained the double rack and pinion focusing at the front of the camera. The design was incorporated into professional studio cameras and smaller amateur cameras. By the mid-1860s front-focus bellows cameras were introduced to take advantage of the improved rigidity and advantages of moving the lens rather than the back standard.

The 1860s also saw the widespread introduction of tailboard cameras. Atkinson's Portable camera was described to the Photographic Society in 1857 but it was not until commercial manufacture by P. Meagher, George Hare, W. Watson and others for stereoscopic and single-lens use that the design gained widespread acceptance and by the 1870s it was very popular. The design had a moveable back focusing screen connected by bellows to the lensboard. For storage the back was moved by rack and pinion to the front and the hinged baseboard lifted up to protect the focusing screen and, if present, a side gate was swung across to secure everything.

George Hare manufactured W. J. Stillman's design as the New Universal camera. The design was provisionally patented on 14 November 1871 and gave greater flexibility to move the back and front standards around a fixed central point.

During the period a number of features became standardised and remained an integral part of camera design until the 1900s. With acceptance of the dry plate process from the early 1870s the book-form plate holder holder became standard holding two plates either side of a metal divider. By 1860 most cameras incorporated some form of rising front and, later, a laterally moving front especially on professional studio or more advanced cameras. At the same time a swing-back was incorpo-

rated on most studio cameras. On these the bottom of the back standard was bevelled to allow for the movement and pivoted around a centre screw. Some cameras were refined with a rack and pinion swing adjustment. Meagher produced a swing back that could be fixed in position by a slotted strut and screw.

The 1860s also saw the introduction of the repeating back on studio cameras to produce two or more images on a single plate. This was especially popular for the production of cartes-de-visite. Interchangable lens panels and cameras with removable septums allowed them to be used for stereo and normal photography. In-camera processing reached it's height with the introduction of the Dubroni camera in 1864 which had a ceramic interior to hold chemicals to process the plate internally. A range of models were made in different plate sizes and styles. Designs of stereo cameras continued although most adopted Window's design to hold two lenses with some of the best known being sold by J. H. Dallmeyer in the 1860s.

Travelling camera outfits also became popular with the camera, darkslides and chemicals usually being contained in one box or even within the camera.

Many of the designs that were introduced in the 1870s were still in production and use, especially by professional photographers and studios at the end of the century. It was developments with roll film and smaller hand cameras for amateur use that showed the greatest innovation and change over the next three decades.

MICHAEL PRITCHARD

See Also: Cartes-de-Visite; and Roll Film.

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CAMERA DESIGN 4 (1850–1900)

Studio cameras

The basic design of studio cameras did not change significantly after the early 1860s and the move from sliding box pattern cameras to front-focusing bellows cameras had taken place. Refinements to designs tended to reflect specific needs and the preferences of individual camera manufacturers to produce distinctive and marketable designs.

There is no precise definition of a studio camera. Field and tailboard cameras that were ostensibly designed for travelling with could quite easily be used in a studio. By end of the century companies such as Marion and Co. and George Houghton and Sons of London were listing cameras under the heading studio cameras that 'have been so designed, constructed, and finished, as to meet the demands of the most critical user.' The cameras were generally large with a minimum plate size of 6 inches square. They were constructed of mahogany with brass fittings, rackwork adjustment at the back and front and usually a double extension base. This allowed the camera to produce a variety of negatives by means of reducing and repeating backs, it could accept a variety of lenses and could be used for copy work as well as portraiture and it usually came on a wheeled studio stand. The stands would be adjustable vertically through a geared crank and would have adjustments for tilting. Cameras were generally advertised in standard plate sizes from 6½ to 24 inches square although larger models were occasionally advertised in the earlier period before enlarging became widespread.

The first commercially made cameras for the daguerreotype process such a Giroux and Wolcott cameras were rigid box form cameras and designed to be used in a studio close to processing facilities. The sliding box pattern of camera became more widespread and although models were made for travelling the design was also firmly used within the studio during the 1840s and 1850s. The cameras were generally whole-plate (8½ × 6½ inches) or larger and with sufficient extension to cope with full-length to head and shoulder portraits. They were generally mounted on a wheeled studio stand. The widespread introduction of bellows to studio cameras set their design for the remainder of the century.

Both the box form and bellows cameras performed the same task of keep light from between the lens and plate holder. Most of the innovations in studio camera design were concentrated around the lens and plate holding parts of the camera. Repeating backs were first introduced in the early 1850s for stereo photography and were designed to allow two images to be taken by a single lens camera. They were suggested by Claudet in 1851 although had probably been in use before this. With most an extended plate holder holding two separate daguerreotype plates or a single glass plate was pushed into position and was held in either position by a spring catch. The focusing screen was removed completely or pushed out of the way during the two exposures.

The craze for cartes-de-visite and cabinet cards from the early 1860s and non-standard format photographs through to the 1890s led to the development of backs and cameras to accommodate them. Repeating backs were designed to allow multiple exposures to be made on one plate which was contact printed to make the cartes or cabinets. Special cameras were designed with multiple lenses to allow identical images to be made with one exposure on a single plate. This technology also

Falk, Benjamin J. Wilfred Draycoff. Actor posing with a large format camera.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

allowed, through the use of special darkslides, which was essentially the selective uncovering or manipulation of some of the camera's multiple lenses via different poses, a different effect on the plate. F. R. Window's Diamond Cameo camera of 1864 allowed cameo sized photographs to be made on one plate by vertically and laterally moving the darkslide. The 1890s craze for stamp photographs lead to cameras with up to 15 lenses and repeating backs that could allow many images to be exposed on to one plate.

Multiple lens studio cameras were first introduced in 1855 in America when Albert R. Southworth was granted a patent for a four-lens camera, French and British manufacturers quickly produced their own designs with the most popular style producing four 2 × 3¼ inch negatives on a whole plate. Lancaster's Gem camera produced 12 1-inch square negatives on a quarter-plate. Fallowfield and other manufacturers produced cameras with four, nine or twelve lenses for meeting the demand for popular sizes of photograph. These cameras would either make one identical image through each lens on the sensitised plate, especially where six or more lenses were being used, or various methods were employed, notably the repeating back, so that different images could be exposed one or more lenses. The resultant plate was usually contact printed and the paper print with the multiple portraits cut up and mounted.

The distinction between amateur and professional or between studio or portable cameras was not clear and manufacturers such as W. Rouch would frequently advertise cameras as: 'New Folding Studio and Field camera. The most useful and portable instrument for both Amateur or Professional use, use aiming to maximise the market for their product.

The other important addition that the studio camera had was the reducing back which allowed the camera to make negatives smaller than the maximum plate size through smaller plate holders that fitted the camera and either a smaller focusing screen or, more usually, the full-size focusing screen marked with the smaller plate sizes. The use of full-size plate holders with reducing inserts for smaller plate sizes also allowed smaller negatives to be made where necessary. George Hare's Universal camera was advertised in 1874 as being 'adapted for the Single or Double Cartes-de-Visite, for Half or Whole-plate Portraits, for the new Cabinet Pictures, and can be used for Copying.'

The studio camera also encouraged the production of accessories for it. The studio stand was an essential part of the camera and ranged from basic fixed tripods with extra strengthening and a top for support the camera to elaborate tables with shelves and adjustments. All were mounted on wheels. The darkcloth was essential to aid focusing. The fashion for vignetting in the 1870s lead to special attachments to be added to the front of the camera and by the late nineteenth century shutters would be mounted inside the camera and operated by an air or mechanical release set into the camera.

MICHAEL PRITCHARD

See Also: Cartes-de-Visite; Cabinet Cards; and Daguerreotype.

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CAMERA DESIGN: 5 PORTABLE HAND CAMERAS (1880–1900)

Whilst a small number of cameras designed to be hand-held had appeared as early as the 1850s, such cameras

were extremely unusual in the wet-collodion period when exposures of several seconds were the general rule. However, the introduction of more sensitive, commercially manufactured gelatine dry plates in the late 1870s made 'instantaneous' exposures fully practical for the first time. During the 1880s, cameras designed to be used whilst hand-held became popular. Hand cameras developed along three distinct lines—box-form or 'detective' cameras; folding or strut cameras; and hand and stand cameras.

In 1881, Thomas Bolas took out a British patent for a box-form plate camera. Because it could be used in the hand, inconspicuously, he coined the name 'detective camera' for his invention. The term came to be applied to almost all hand cameras that appeared up to the end of the century. The first detective camera to be widely sold was William Schmid's Patent Detective camera of 1883. A plain, oblong wooden box, this incorporated a shutter, focusing system and viewfinder, which were to become features of the hand camera. Most detective cameras were simple wooden boxes, sometimes covered in leather or even brown paper so as to resemble bags or parcels. Some, however, took concealment a stage further. During the 1880s large numbers of disguised cameras appeared, designed to resemble, for example, books or watches or to be hidden in ties, hats or walking sticks or under worn beneath a waistcoat.

During the 1880s a number of designs appeared for cameras that held a number of plates that could be exposed successively, thus doing away with the need to change plate holders after each exposure. Incorporating ingenious plate changing arrangements, these were known as magazine plate cameras and enjoyed their greatest popularity in the 1890s. Examples include, Rouch's 'Eureka' camera, Marion's 'Radial' camera and Fallowfield's 'Facile' camera—the favourite camera of Paul Martin. Magazine plate cameras tended to be bulky and the weight of the glass set a limit to the number of plates that could be conveniently carried. An alternative approach was to use sheets of celluloid film. One of the most popular cameras to use film packs was R & J Beck's 'Frena' camera, introduced in 1892. However, by the time the Frena appeared, hand cameras which used roll film were rapidly gaining popularity.

Roll-holders, which used bands of sensitised paper as an alternative to glass plates first appeared in the 1850s. The first roll-holder to enjoy any commercial success was designed by George Eastman and William Walker and went on sale in 1885. Eastman subsequently worked on incorporating his roll-holder into a simple detective camera. However, Eastman was pre-empted by two other Americans, Robert Gray and Henry Stammers, who patented their 'America' detective camera in May 1887. Whilst it was not a commercial success, this camera is significant as being the first hand camera to use roll film. The following year, Eastman introduced his detective camera which incorporated a roll holder and gave one hundred exposures on sensitised paper film. Eastman decided to create a new trade name for his camera—a name that would be novel, distinctive and easily pronounced in most languages. The name he came up with was 'Kodak.'

The Kodak camera was successful from the start and it was followed during the 1890s by a range of folding and box-form Kodak cameras of various formats. In 1900 the first Brownie camera was introduced—the camera that was to become synonymous with snapshot photography and was to transform the medium into a truly popular pastime. In 1889 Eastman introduced the first commercial transparent celluloid roll film in place of his earlier paper-based film and from 1895 onwards, film was supplied in 'cartridges' for daylight loading.

Whilst the Eastman Company soon came to dominate the market, the success of the Kodak prompted a number of other inventors and manufacturers to design hand roll film cameras. Examples include L'Escopette of 1888, the Luzo camera of 1889, and the Prizma Detective camera of 1890. However, none of these were to enjoy a fraction of the Kodak's success and popularity.

Following their initial novelty, box-form plate cameras—except for magazine plate cameras—became less popular during the 1890s. In their place appeared a variety of compact collapsing hand cameras in which the lens panel pulled out, attached to a bag or bellows, and was locked in position by struts. Strut cameras had the advantage of being lighter, more compact and easier to carry than box cameras. A number of popular designs appeared during the 1890s, including Shew's 'Xit' camera, Newman & Guardia's 'Nydia' camera and the Goerz-Anschutz folding camera of 1896 which was to be the basis of most press cameras right up to the 1930s. Folding roll film cameras also first appeared during the 1890s. Eastman's Folding Pocket Kodak camera, introduced in 1897, was the first of a range of popular folding cameras. The No 3 Folding Pocket Kodak camera of 1900, in which the camera front folded down to form a baseboard along which the lens panel was drawn out, set the standard pattern for the design of folding roll film cameras for the next fifty years.

Following the introduction of dry plates, the first folding hand cameras were simply traditional field cameras to which a shutter and viewfinder had been added. Smaller format field cameras could easily be hand-held. These evolved into cameras that were made specifically for hand use but also incorporated several features that were normally associated with stand cameras, such as rising-front and swing back movements. Since they could be used either in the hand or on a tripod, they were known as 'Hand and Stand' cameras. One of the most popular forms of hand and stand camera was introduced

by George Houghton & Son in 1899. A hand-held version of their innovatively designed Sanderson camera it remained on sale until 1939.

COLIN HARDING

See Also: Camera Design 6: Kodak Cameras (1888–1900)

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CAMERA DESIGN: 6 KODAK (1888–1900)

In 1888 George Eastman patented and introduced a small box-form camera which he named 'The Kodak.' This camera initiated a revolution in photography that was to quickly transform it into a truly democratic pastime within the range of everyone, regardless of income or technical knowledge. A hand-held 'detective' camera, the Kodak was fitted with an integral roll holder and took pictures on long rolls of sensitised paper. Extremely simple to use, it reduced taking a photograph to three simple actions: 1. Pull the string. 2. Turn the key. 3. Press the button. The camera itself did not embody any great technical advances; it was not even the first camera designed solely to take roll-film. The most revolutionary aspect wasn't in fact the camera, but Eastman's concept of separating the act of picture-*taking* from that of picture-*making*. The Kodak was sold already loaded with film for 100 exposures. After this had been exposed, the entire camera was returned to the factory for the film to be unloaded, developed and printed. The reloaded camera was then returned to its owner, together with a set of prints. The Kodak system was summed up by Eastman's famous advertising slogan—'You Press the Button, We do the Rest.' For the first time, anyone (as long as they could afford the 5 guineas which the Kodak cost) could become a photographer.

In 1889 Eastman introduced the first commercial transparent celluloid roll-film to replace the less satisfactory paper film. That same year, a larger version of the Kodak, the No. 2 Kodak camera, appeared, taking a 3 ½ inch circular negative. The next year, this was followed by the Nos. 3, 4 and 5 Kodak cameras, taking even larger negatives, up to 4 by 5 inches.

The first Kodak cameras had to be loaded with film in a darkroom. In 1891 Eastman introduced a new range of cameras which were designed to overcome this inconvenience. Externally, the aptly-named A B and C Daylight Kodak cameras looked very similar to the original Kodak cameras. However, the roll-film was contained in light-proof cardboard containers that protected the film when loading or unloading, the film being wound from one container to another through velvet-lined slots. Daylight Kodaks were not a commercial success. The following year, S. N. Turner of the Boston Camera Manufacturing Company came up with a much neater solution to the problem of daylight loading. His Bull's-Eye camera of 1892 used paper-backed 'cartridge' film wound on to a spool with flanged ends, which protected it from light. Numbers printed on the backing paper could be read through a little red window in the back of the camera. Realising the superiority of Turner's system, Eastman initially purchased a licence from Turner and in 1894 began production of a range of Bullet cameras which used cartridge film. In 1895 Eastman bought out the Boston Camera Company and began the manufacture of the very popular Pocket Kodak cameras which also used daylight loading cartridge film. The Pocket Kodak camera really was pocket-sized, being a small box measuring just 2 by 3 by 4 inches. It was the first Kodak camera to be manufactured using mass production techniques and 600 cameras a day were turned out by the Eastman factory in Rochester.

The Pocket Kodak camera was convenient to use but the negatives it produced were very small—just 1½ by 2 inches. In order to create a camera which was still compact enough to be easily carried but which took larger pictures, Frank Brownell, Eastman's camera designer, came up with an ingenious folding design. When closed, the Folding Pocket Kodak camera of 1897 was almost as small as the Pocket Kodak camera, but it opened up on spring-loaded struts for use and took negatives 2¼ by 3¼ inches. The Folding Pocket Kodak was the first of a range of folding cameras that were to be produced for many years and which were to prove enormously successful. Also in 1897, the first of a range of folding roll-film cameras aimed at the enthusiast appeared—the No. 4 Cartridge Kodak, taking 5 by 4 inch negatives. This was followed by the No. 5 Cartridge Kodak in 1898 (7 × 5 in) and, finally, the No. 3 Cartridge Kodak in 1900 (3¼ × 4¼ in). Comparatively expensive, these were available in a range of lens and shutter combinations and featured such refinements as rack and pinion focusing and rising and cross-front movements.

Whilst Kodak from the beginning concentrated on film cameras, during the 1890s they also produced a number of models designed to take glass plates. Their range of Kodet and Folding Kodet cameras, for example, could be used with either plate holders or a roll holder. Kodak also entered the specialised panoramic and stereoscopic arena with the No. 4 Panoram Kodak and the No. 2 Stereo Kodak, introduced in 1899 and 1901 respectively.

In 1900, Eastman addressed the financial constraints which still meant that snapshot photography was beyond the means of many people. Mass production had brought the cost of cameras down—the Pocket Kodak,

for example cost one guinea. However, this was still too expensive for many aspiring photographers. Eastman asked Brownell to design a camera which could be mass produced for very low cost. The result was the Brownie camera. A box camera fitted with a simple lens and shutter, the Brownie sold for just 5 shillings. Named after the Brownie characters popularised by the Canadian writer, Palmer Cox, the camera was initially aimed at children. Soon, however, it enjoyed much broader appeal as people realised that although very basic, the Brownie could produce very good results under the right conditions. Within a year, over 100,000 Brownie cameras had been sold. For the next eighty years, the Brownie name was to be synonymous with snapshot photography.

COLIN HARDING

See Also: Kodak; and Camera Design: 5 Portable Hand Cameras (1880–1900).

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CAMERA DESIGN: 7 SPECIALIST AND NOVELTY CAMERAS

A large and increasing number of specialist and novelty cameras were introduced through the nineteenth century. Specialist cameras were designed to accomplish tasks that were beyond the standard studio or amateur camera such as panoramic photography and novelty cameras in design or appearance were manufactured to take advantage of new photographic processes or methods such as roll film or materials from which to manufacture cameras. Others were made to look unlike a typical camera and pass unrecognised. The definition of novelty changed over time.

Specialist cameras were introduced early on. Cameras designed for stereoscopic work in either single or double lens versions were introduced as early as 1852. The first stereoscopic camera is credited to J. B. Dancer who made a binocular camera in 1852, shown in 1853, and was refined in to the 1856 patented Binocular camera. Dancer's fellow Mancunian Petschler introduced his own design shortly after 1852. Latimer Clark introduced his single lens version on a special parallelogram in 1853. Most other manufacturers introduced their own versions of rigid box, sliding box, and front-focusing stereo cameras during the 1850s and 1860s until demand declined. From the later 1880s into the 1900s there was a renewed interest in stereoscopy and many manufactuers introduced stereoscopic versions of their regular models. These were all with two lenses as the single-lens camera was impractical for hand use. The stereo Photosphere of 1888, stereo-jumelle hand cameras of the 1890s, stereo versions of mahogany field cameras, the Stereo Sigriste of 1898, and detective hand cameras such as the Tit-Bit are all examples of stereo versions of regular cameras. There were also cameras such as the Richard Verascope of 1894 and the Stéréocycle of 1898 that only appeared in stereo models.

Panoramic photography was also in demand from photography's earliest days. In 1845 Frédéric Martens mounted a specially adapted daguerreotype camera on the roof of the Louvre and took 150 degree views of Paris on curved plates 12 × 38cm. Martens used a stationary camera with a lens rotated by clockwork. The camera was also adapted to make paper negatives. In Britain Thomas Sutton designed a water-filled lens in 1859 and a special camera designed to take curved glass plates was sold by Ross. The camera and lens appeared in a variety of sizes and produced 120 degree views. Johnson and Harrison's patent of 5 September 1862 described a camera that moved by clockwork on a turntable and could cover 110 degrees. Other designs such as Moëssoral's Cylindrographe of 1889, the Kodak Panoram of 1899 and the Al Vista of 1899 all moved the camera lens. The Cirkut , Wonder Panoramic camera of 1889 and Damoizeau Cyclographe all moved the camera on special turntables.

In-camera processing was also attempted early on and was suggested by Talbot who was the first person to patent such a camera in 1851. In his design the plate was dropped into a glass cell within the camera and silver nitrate added for sensitising purposes, after exposure the developing chemicals were added and drained as necessary. No record exists of the design having been produced.

Over twenty different British patents were granted for in-camera processing during the next thirty years up to the 1880s. The first such patent for a camera that was made commercially was designed by Frederick Scott Archer. Archer's portable folding camera was registered in February 1854 but first appeared the previous year and was discussed in the Photographic Society's *Journal* of 21 April 1853. Mr Shelley having seen the demonstration by Archer stated 'Mr Archer's camera possesses the advantage that the whole is carried in one box.' The same issue included Newton's patented design for a similar camera. Archer's camera was also described and illustrated in Robert Hunt's *Manual of Photography* of 1854. The camera was made commercially and improved upon by Mr Griffin and sold by him with a 2½ inch achromatic lens for views and chemicals for £16 6s. A tripod was £1 extra. The Dubroni camera of

1864 was a commercial successful and available in the 1870s in a variety of designs and plate sizes. The camera was patented by G. J. Bourdin in 1864 and contained a ceramic interior lining and an opening in the top which allowed a pipette to insert and remove processing chemicals. The camera back on some models held a red window for visual inspection. Allied to this were ferrotype or tintype cameras, producing photographs on metal plates within a few minutes, which gained popularity from the 1880s and variety of designs were produced by Fallowfield and other makers.

The end of the nineteenth century saw the introduction of three-colour cameras Frederick Ives's Krömsköp camera, viewer and projector were introduced from 1890. Louis Ducos du Hauron'a Chromographoscope of 1879 and Melanochromoscope of 1897 were all one-shot three-colour cameras. The next century would see these developed further.

Multiple lens cameras for producing cartes-de-visite, cabinet and Gem and stamp cameras were introduced from 1860 and remained popular in different forms throughout the century as studio cameras.

Specialised cameras were also designed for photomicrography. Many of the large scientific instrument makers such as Smith, Beck and Beck, Negretti and Zambra, John Browning and others produced cameras designed to be attached to microscopes from the 1860s onwards and these were developed and refined throughout the century. Collodion negatives with their sharp definition made possible micophotograptihic cameras for producing very small negatives of large objects for use in Stanhopes and on microscope slides. J. B. Dancer produced the first of these in 1856 but the best known was René Dagron's camera of 1860 which, via a repeating back, made 450 exposures 2 × 2mm on 4.5 × 8.5cm plates. The camera had twenty-five lenses.

The first novelty cameras in the sense of being very different to standard cameras date back to December 1858 when Thomas Skaife introduced his Pistograph camera. The metal camera produced circular negatives 1 inch diameter on wet-collodion plates. Thomas Ottewill produced a camera clearly based on the Pistolograph in 1860. A similar camera was produced by Marion and Co in 1884 as their All Metal Miniature camera for 1¼ inch square dry plates. The Kombi of 1893 was square metal boxform camera taking 1 inch negatives on roll film. The camera was also used to view the negatives. Other cameras such as the Escopette of 1889 and metal Demon of 1893 were of novel shape.

Cameras disguised as other objects start with the Thompson revolver camera of 1862 which was made by A. Briois in Paris. The camera made four exposures on a 7.5 cm diameter glass plate. Nicour's Photo-Binocular camera of 1867 appeared in the form of a pair of binoculars with a circular magazine holding 50 1½ inch square glass plates mounted on top. The 1880s and 1890s saw the greatest craze for disguised cameras when dry plates and roll film, faster lenses and a wider range of metals and construction techniques to make cameras allowed designer's ideas to be fulfilled. E. Enjalbert's Photo-Revolver de Poche of 1883 was designed using real revolver parts and made ten exposures on 2 × 2 cm plates. Stirn's Vest camera of 1886 was based on R. D. Gray's American patent and was designed to be hidden behind a waistcoat with the lens poking through a button hole. Krügener's book camera of 1889 was sold in different countries under different name and the Lancaster patent watch camera of 1886 was the first of a number of cameras disguised as pocket watches.

Cameras were also disguised as satchels, a group of books, binoculars, walking sticks, hats and cravatte. Some produced photographs that were acceptable within the limits of the negative size and lens, others, especially later on were novelties in the worst sense of the word and little more than toys.

MICHAEL PRITCHARD

See Also: Camera Design: 4 late (1850–1900); Daguerreotype; Cartes-de-Visite; Collodion Negatives; and Ottewill, Thomas.

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CAMERA DESIGN: GENERAL

It may seem like an anachronism but the discovery and use of the camera actually precedes the discovery of photography by hundreds of years. The phenomenon of the *camera obscura* (Latin for 'dark room') had been known since ancient times. If a small hole is made in the window blind of a darkened room, an inverted image of the scene outside the window is produced on the opposite wall of the room. A clear description of the camera obscura is contained in the manuscripts of Leonardo da Vinci in the fifteenth century and by the middle of the sixteenth century, lenses had begun to be used to increase the brightness and sharpness of the image. By the seventeenth century, portable box-form versions had appeared and these were used widely by artists as aids

for sketching. Portable camera obscuras like these were used by the inventors of photography and are the direct precursors of the photographic camera.

The first photographic camera to go on public sale was manufactured by Alphonse Giroux in 1839. This was an adaptation of a camera obscura design and consisted of two wooden boxes, one sliding within the other, one fitted with the lens and the other holding the focusing screen and plate holder. Throughout the 1840s and 1850s, the sliding box design was the standard for general photography. Sliding box cameras had a number of advantages—they were robust and simple to make and use. However, they were heavy and bulky to carry around. To try and solve this problem, several manufacturers produced folding, collapsible versions of sliding box cameras. With the lens panel and focussing screen removed, hinged side panels could be collapsed to make a compact package. Most cameras were simple, wooden boxes, but there were some novel and ingenious uses of other materials and designs for specific applications. For example, Voigtlander's conical all-metal camera for daguerreotype portraits.

The camera design most popularly associated with the Victorian period is the folding stand camera, fitted with bellows. Several designs for folding cameras fitted with flexible bodies in place of solid wooden boxes appeared in the early 1850s. These used cloth bags and struts. In 1857, a camera design which used pleated bellows was patented by the Scottish photographer, Kinnear. Kinnear's design became the standard and was copied by most manufacturers. By the 1860s, folding bellows cameras had become established as the tool for general photography. There were many different manufacturers and variants but most differed from each other only in detail, the basic design remaining unchanged until well into the twentieth century. Folding bellows cameras were produced in a range of formats and for a variety of applications—for example, twin lens cameras for stereoscopic photography and large format cameras on heavy stands for studio-based portraiture.

The introduction of commercially manufactured gelatine dry plates in the late 1870s made 'instantaneous' exposures fully practical for the first time and the first cameras designed to be used whilst held in the hand camera appeared. Hand cameras developed along three distinct lines—box-form or 'detective' cameras; folding or strut cameras; and hand and stand cameras.

In 1881, Thomas Bolas took out a British patent for a box-form plate camera. Because it could be used in the hand, inconspicuously, he coined the name 'detective camera' for his invention. The term came to be applied to almost all hand cameras that appeared up to the end of the century. Following their initial novelty, box-form plate cameras became less popular during the 1890s. In their place appeared a variety of compact collapsing hand cameras in which the lens panel pulled out, attached to a bag or bellows, and was locked in position by struts.

Most detective cameras were simple wooden boxes, sometimes covered in leather or even brown paper so as to resemble bags or parcels. Some, however, took concealment a stage further. During the 1880s large numbers of disguised cameras appeared, designed to resemble, for example, books or watches or to be hidden in ties, hats or walking sticks or under worn beneath a waistcoat.

During the 1880s a number of designs appeared for hand cameras that held a number of plates that could be exposed successively, thus doing away with the need to change plate holders after each exposure. Incorporating ingenious plate changing arrangements, these were known as magazine plate cameras and enjoyed their greatest popularity in the 1890s. However, by this time, hand cameras which used roll film instead of glass plates were becoming increasingly popular.

Roll-holders, which used bands of sensitised paper as an alternative to glass plates first appeared in the 1850s but the first to enjoy any commercial success was designed by George Eastman and William Walker in 1885. Eastman subsequently worked on incorporating his roll-holder into a simple camera and in 1888 he introduced his detective camera which gave one hundred exposures on sensitised paper film. Eastman decided to create a new trade name for his camera—a name that would be novel, distinctive and easily pronounced in most languages. The name he came up with was 'Kodak.'

The Kodak camera was successful from the start and it was followed during the 1890s by a range of folding and box-form Kodak roll film cameras of various formats. In 1900 the first Brownie camera was introduced—the camera that was to become synonymous with snapshot photography and was to transform the medium into a truly popular pastime.

The early years of photography were characterised by a limited range of camera designs, which served for a very wide range of applications. However, the end of the nineteenth century witnessed an absolute profusion of camera designs, reflected in over a thousand pages of advertisements in the *British Journal Photographic Almanac*. Long established family businesses using craft techniques competed with international corporations exploiting the economics of mass production. The use of traditional materials such as mahogany continued but metal became increasingly used in camera manufacture. Folding bellows stand cameras rubbed shoulders with reflex and magazine hand cameras. Plate cameras competed with roll film models and there were cameras aimed specifically at the amateur or professional market—from Brownies for family snapshots to strut cameras for press photography. In addition, there were

specialised cameras for specific formats and applications such as stereo, panoramic and studio photography. In a period of sixty years, camera design had undergone a radical transformation, from hand-made wooden boxes to mass-produced precision engineering products.

COLIN HARDING

See Also: Camera Design: 1 (1830–1840); Camera Design: 2 (1850); Camera Design: 3 (1860–1870); Camera Design: 4 late (1850–1900) Studio cameras; Camera Design: 5 Portable Hand Cameras (1880–1900); Camera Design: 6 Kodak (1888–1900); Camera Design: 7 Specialist and novelty cameras; Camera Design: Panoramic Cameras; and Camera Design: Stereo Cameras.

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CAMERA DESIGN: PANORAMIC CAMERAS

The history of panoramic photography can be traced back to the earliest days of the medium. William Henry Fox Talbot, for example, produced panoramic views in the early 1840s by rotating his camera after each exposure so as to produce a series of photographs, each overlapping the previous view slightly. Sequential panoramas such as these do not require a special camera. Soon, however, cameras designed specifically for making panoramic photographs in a single operation appeared. Panoramic cameras can be classified into three broad categories: cameras with rotating lenses and fixed plates or films; rotating cameras with moving plates or films; and, finally, cameras fitted with wide-angle lenses. Examples of all three types of panoramic camera were produced concurrently during the nineteenth century.

The first patent for a fixed-plate, rotating-lens panoramic camera was granted to an Austrian chemist, Joseph Puchberger, in 1843. His camera combined a curved daguerreotype plate with a lens that rotated by turning a hand crank, giving an image with an angle of view of about 150 degrees. Much better known is a camera designed on a very similar principle the following year by Friedrich von Martens, a German living in Paris. Called the Megaskop, this also produced panoramic daguerreotypes on curved plates. In 1856, Ludwig Schuller, Martens' nephew, used a version of this camera for wet-plate photography on curved glass plates. In 1884, P. Moessard was granted a patent for his Cylindrographe camera. This used paper negative film in a curved flexible holder and covered up to 170 degrees with its swivelling lens that was rotated manually by turning the viewfinder. The first panoramic camera to be sold in any quantity appeared in 1897. Made by the Multiscope & Film Co. in Wisconsin, this rotating-lens, roll-film camera was called the Al Vista. The rotating lens was driven by clockwork and covered an angle of nearly 180 degrees. Following the success of the Al Vista, Kodak soon entered the panoramic market with a hand-held snapshot panoramic camera. The first panoramic Kodak camera, the No. 4 Panoram Kodak, was introduced in 1899. This covered an angle of 142 degrees and produced 3 inch by 12 inch negatives on roll-film running in a curve inside the back of the camera. Two traversing speeds could be set for the lens by adjusting the tension of a spring. In 1900, Kodak introduced another, similar model, the No. 1 Panoram Kodak, which recorded a slightly smaller angle of view. Panoram Kodak cameras remained on the market until the 1920s and reflected the popularity of panoramic photography during the early years of the twentieth century. Panoram Kodaks were used by several prominent photographers of the time, including George Davison. They could be used both horizontally and, less commonly, vertically, to record subjects such as trees, tall buildings or waterfalls.

The second group of panoramic cameras are those that combine a rotating camera with a moving plate or film. In 1862, John R. Johnson and John A. Harrison took out a patent for their Pantascopic camera that produced panoramic photographs by rotating the camera and, at the same time, moving a glass plate. The camera body was rotated by a clockwork motor. As the camera rotated, a wet collodion plate was moved in synchronism, past an exposing slot in the camera back, to record an angle of view of 110 degrees. For cameras of this type, roll-film was much more convenient than glass plates. Following the introduction of flexible paper, then celluloid, film in the 1880s, a number of new designs appeared based on a similar principle. These included Stirn's Wonder Panoramic camera of 1889, Damoizeau's Cyclographe camera of 1890 and Stewart's Panoramic camera of 1895. The best-known and most widely used rotating and moving-film panoramic camera appeared at the beginning of the twentieth century. Patented in 1904, the Cirkut camera was produced in a variety of models and sizes which all worked in essentially the same way. The camera was rotated by a clockwork motor which also moved the roll of film past an exposing slot in synchrony with the turning of the camera. Cirkut cameras were still being produced in the 1940s and were extremely popular for panoramic large group photographs. Because the camera traversed relatively slowly, it was possible for a person standing at the end of the group where the camera started to run to the other end of the group before the camera reached there—and to magically appear twice on the same photograph.

The last, and least numerous, type of panoramic

cameras are those which are fitted with a wide-angle lens. The first panoramic camera to use such a lens was devised by an Englishman, Thomas Sutton, in 1859. Sutton was granted a British patent for a spherical, water-filled lens that gave a field of view of 120 degrees. He is said to have been inspired by looking at a glass 'snowstorm' souvenir, popular with Victorian tourists, that a friend had brought home from Paris. Cameras incorporating Sutton's innovative lens were made by London camera makers Frederick Cox and, later, Thomas Ross. To compensate for the lens's curvature of field, these cameras used curved glass plates. This meant, however, that they had to be supplied with a special, curved sensitising tank and a curved printing frame. It is estimated that only around thirty Sutton panoramic cameras were made.

COLIN HARDING

See Also: Panoramic Photography; and Sutton, Thomas.

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CAMERA DESIGN: STEREO CAMERAS

The stereoscope was devised in 1838 by Charles Wheatstone to demonstrate the principle of binocular vision and its role in depth perception. Using pairs of drawings to represent the slightly different images seen by each eye, the stereoscope used mirrors to superimpose them into a single image with a three-dimensional appearance. With the invention of photography a decade later, the images used in the stereoscope could be infinitely more varied and detailed, and the effect of solidity more startling. Initially, a single camera was used to produce two daguerreotypes or calotypes in succession; the operator would move the camera a couple of inches to one side between exposures in the attempt to produce pictures that corresponded as closely as possible to what was seen by the two eyes. This was a process of trial and error—once superimposed in the stereoscope, the effect of three-dimensionality might be compromised by inadequate (or exaggerated) distance between the two exposures, or by alteration of the camera angle, the subject's position, or lighting conditions.

In 1849 Sir David Brewster invented a refracting, lens-based stereoscope that was more portable and easier to use than Wheatstone's reflecting model, and in 1851 the wet-plate collodion process was introduced. These two innovations cemented the alliance between stereoscopy and photography and gave rise to the stereoscopic industry. Photographers and camera manufacturers immediately turned their attention to the specific requirements of the Brewster stereoscope. Stereographs were—two 8.2 cm square pictures, separated by about 0.6 cm, mounted side by side on a 11.4 × 17.8-cm card. They were standardized, and mass-produced photographic images, dominating the commercial market from 1852 to 1880.

There were very early cameras which took two separate exposures on two separate plates. The camera body slid on a baseboard taking two separate and sequential square plates (Powell 1858 for example). Another device mounted pairs of cameras (Jacob Brett, 1853), where another camera had a sliding lens panel which took two sequential images on the same plate (Spencer, 1854).

Two basic types of cameras were designed to produce stereoscopic pairs: single-lensed and double-lensed. British engineer and photographic enthusiast Latimer Clark presented the first single-lensed stereoscopic camera at the fourth meeting of the Photographic Society, in 1853. Clark mounted an ordinary box camera on a grooved baseboard that allowed its position to be changed quickly and consistently between exposures. The direction or angle of the camera could be adjusted by pivoting the rulers mounted on the board. This accommodated an early theory of stereoscopic picture-making, known as toeing-in, according to which the camera's position should be adjusted and angled for the second exposure so that near objects in the center of the first exposure were also in the center of the second.

Clark further improved the single-lensed camera with a repeating back which allowed a stereoscopic pair to be produced on a single plate. With the camera pushed to the right side of the baseboard, the first exposure (representing what the right eye would see) was made on the left side of the plate. The camera was then slid to the left, the dark slide pushed home, and the second exposure (the left eye's view) made next to the first on the right side of the plate. Transposed in printing, the resulting pair could be viewed in the Brewster stereoscope.

Lens distance emerged as the most controversial aspect of stereophotography. A separation greater than the normal 6.4 cm between the eyes produces a slight reduction in scale but an increased illusion of solidity, enhancing landscape views in particular. Single-lensed camera with long baseboards, such as that designed by Andrew Ross, allowed experimentation with these hyperstereoscopic effects, which some criticized as deceptive, a perversion of the principle of binocular vision.

Double-lensed camaras fixed the distance between the two exposures, typically at about 8.9 cm, slightly

greater than average interocular distance. Developed in the early 1850s by Achille Quinet, the first double-lensed model to become widely available was patented in 1856 by John Benjamin Dancer. The Manchester instrument maker had experienced difficulties taking two separate pictures, and decided to construct a camera "in form somewhat like" the Brewster stereoscope. Dancer's advocacy of strict interocular distance went against the grain in the early 1850s; he later recalled that his camera was at first "much ridiculed by those who were supposed to be authorities on the subject." Yet they came into common use.

The simplest version of the binocular camera has two lenses with focal lengths of 10.8-14 cm mounted in a front panel; a central partition divides the rear box. With this design the lenses had to be uncapped one after the other. Various modifications provided portability, affordability, or rapidity—advantages that compensated for the fact that the side-by-side pictures, once printed, had to be transposed before being mounted to a cardboard support. For example, in some models, the partition was hinged at the top and spring loaded so it could be pushed out of the way to accommodate the lens panel, which folded inside the camera for protection of the lenses in carrying. Dancer reintroduced Noël Marie Paymal Lerebours's idea of placing wheel diaphragms in front of lenses with different apertures (12-4 mm). With lenses of 11.4 cm focal length, these provided effective apertures of f/9 to f/28. A flat strip of brass attached to the center of the lens panel served as a shutter; it could be pivoted to cover or uncover both lenses simultaneously.

Stereo cameras incorporated improvements that proved important to other branches of photographic practice. Since the image size is small, stereo cameras had short focal lengths and short exposure times—the first so-called instantaneous photographs (1/5 second exposure) were produced by George Washington Wilson in 1857 with a binocular camera. Stereo cameras were also adapted to produce the other leading commercial photographic format, the carte-de-visite. André-Adolphe-Eugène Disdéri designed a 4-lensed camera with a sliding plateholder in 1864, which efficiently produced eight poses exposures on a single plate. Cameras with even more lenses followed.

The introduction of dry plate photography in 1871 prompted manufacturers to design a wide variety of compete stereoscopic outfits, with lids forming trays where camera could be placed when in operation. A single-lens stereoscopic outfit, including darkslides and the grooved board, could be fitted into a wooden box about 33 × 18 × 15 cm. For binocular cameras, Dancer introduced an attached plate box with a rack-and-pinion system that allowed the photographer to expose a sequence of plates in full daylight.

The late 1850s and early 1860s represent the height of stereo camera production, with the most models were available for a range of prices. Amateurs (such as Viscountess Clementina Elphinstone Hawarden), professionals (such as Francis Frith, William England, Adolphe Braun, and Timothy O'Sullivan), and publishers (such as the London Stereoscopic Company and T. & E. Anthony) took up stereophotography for experimental or commerical purposes, and camera design generally adopted innovations introduced to ordinary cameras, as in George Hare's bellows design of 1882, for example. Later in the century, the portable hand camera eclipsed the stereo camera, which would reappear in different guises in the twentieth century.

Britt Salvesen

See Also: Stereoscopy; Optics: Principles; Camera Design: 1 (1830–1840); Camera Design: 2 (1850); Camera Design: 3 (1860–1870); and Instantaneous Photography.

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CAMERON, HENRY HERSCHEL HAY (c. 1852–1911)

English photographer and studio owner

The youngest son of the great Julia Margaret Cameron, it is perhaps not surprising that one of the best known photographs by Henry Herschel Hay Cameron is a portrait of his mother, taken c. 1870. Like his mother, he also photographed Alfred Lord Tennyson (c. 1886) and the artist George Frederick Watts (c. 1885).

Despite reportedly having very poor eyesight, he established a well-deserved reputation as a fine photographer, combining commercial portraiture with active membership of the Linked Ring. Indeed he was one of

the founder members of the brotherhood in May 1892 and he was known to the brotherhood by the pseudonym 'Vintner.'

Cameron is listed in London trade directories as the operating a studio at 70 Mortimer Street in London from 1886, subsequently occupying premises at 20 Mortimer Street and in Hanover Square into the 20th century.

His technique—in a reportedly small and cramped studio—was to use only daylight from a small skylight, controlled by a simple calico blind.

Simplicity was his trademark, and in a letter preserved in the Royal Photographic Society (RPS) Collection at the NMPFT Bradford, Frank Meadow Sutcliffe remembered Cameron's advice on dress to a female sitter—'As little and simple as possible, madam, just a wisp of thin muslin over the shoulders will be quite enough, and will not date the portrait'.

JOHN HANNAVY

CAMERON, JULIA MARGARET (1815–1878)

British photographer of portraits and genre scenes

Julia Margaret Cameron was born in 1815 in Calcutta, a week before the Battle of Waterloo and a quarter of a century before the announcement of the invention of photography. Her father, James Pattle, was an Englishman working in India; her mother, Thérèse l'Etang, was French. Of the Pattles' ten children, three died in infancy, leaving Julia and six sisters, all with dark complexions and eyes—inherited from their mother's Indian great grandmother. As children, all seven girls were sent to Europe for the sake of their health and their education, spending much of their childhood with their maternal grandmother in Paris and Versailles.

At the age of 21, Julia and her parents were in South Africa, where they had gone—like many other Europeans living and working in India—to convalesce after illnesses. There she met Charles Hay Cameron, twenty years her senior and an important figure in the British administration of India. Two years later, back in Calcutta, they were married. In Cape Town, too, Julia met another man who was to become very important to her—the astronomer and scientist Sir John Herschel (whom she was later to call her 'Teacher and High Priest').

The newly wed Camerons were soon at the pinnacle of Anglo-Indian society. Charles had succeeded Lord Macaulay in 1843 as the only member of the Supreme Council of India not employed by the East India Company; a year later, when Sir Henry Hardinge arrived in Calcutta as Governor, he left his wife in England and Julia became—at the age of only thirty—his official hostess. Five years later, the Camerons returned to England. Charles was not a healthy man, and he seems to have assumed he could live off the income from his coffee plantations in Ceylon (Sri Lanka), a country he had got to first know when writing his 1832 report on its 'judicial establishment and procedure.'

Charles and Julia were soon as well placed in fashionable London life as they had been in India. The seven Pattle daughters all made 'good marriages' and one, Sara, had returned to London with her husband, Henry Thoby Prinsep, five years before the Camerons. The Prinseps set up house first in fashionable Mayfair, then in Little Holland House, where they surrounded themselves with a coterie of painters (notably George Frederick Watts, who soon moved in), musicians, scientists, and politicians. By then, the Camerons lived three miles away and, though the sickly Charles was often confined to his bed, Julia was frequently at Little Holland House, cultivating the company of the celebrities who would later become subjects of her portraits. She had already met two famous poets—Alfred Tennyson and Henry Taylor (who had been one of Tennyson's rivals for the post of Poet laureate in 1850).

In 1853, Tennyson moved to the village of Freshwater, at the quiet, west end of the Isle of Wight, off the south coast of England. Six years later, while Charles Cameron was visiting his estates in Ceylon with two of their sons, Julia took the two younger boys to stay with the Tennysons and, apparently on impulse, purchased two seaside cottages. Tennyson drove a road down across his estate to the sea to avoid the tourists who came to stare at one of England's most famous men (according to one witness, he was almost obsessed by the thought that everyone was staring at him), and opened a private gate from the grounds of his home, 'Farringford,' into those of 'Dimbola,' as the Camerons' house was called, after one of their estates in Ceylon. Soon, the two families were attracting as many celebrities of the day as at Little Holland House.

Organising musical evenings, poetry readings, plays (she soon built her own theatre) and parties apparently failed to satisfy Cameron's restless energy and intellect. Late in 1863, when Charles was again away in Ceylon, their daughter Julia and her husband, gave Cameron a camera 'It may amuse you, Mother, to try to photograph during your solitude at Freshwater.' There is evidence that Cameron had taken a few photographs before this, or at least collaborated with other photographers; she seems to have experimented with printing other people's negatives. She told Herschel that the painter David Wilkie Wynfield, who made a series of photographs of his fellow painters in fancy dress in the early 1860s, had given her a lesson. It certainly seems unlikely that her children would give her a cumbersome 11" × 9" camera, with its attendant chemical and other accessories, unless she had already shown some interest in the subject.

Cameron herself dated the beginning of her photo-

Cameron, Julia Margaret. Zoe, Maid of Athens.
The Metropolitan Museum of Art, The Rubel Collection, Purchase, Lila Acheson Wallace, Ann Tenenbaum and Thomas H. Lee, and Muriel Kallis Newman Gifts, 1997 (1997.382.38) Image © The Metropolitan Museum of Art.

graphic career from this acquisition of a camera of her own and wrote on most surviving prints of a portrait of Annie Philpot taken soon after, 'My first success.' She was immensely proud of the picture and immediately sent it to Annie's father (a minor Victorian poet) with a covering note: 'My first perfect success in the complete Photograph owing greatly to the docility & sweetness of my best & fairest sitter. This Photograph was taken by me at 1 p.m. Friday Jan. 29th. Printed—Toned—fixed and framed all by me I given as it is now by 8 p.m. this same day.'

Cameron had at last found an outlet for her restless energy and enthusiasm: 'I turned my coal-house into my dark room, and a glazed fowl house I had given my children became my glass house. The hens were liberated, I hope and believe not eaten. The profit of my boys upon new laid eggs was stopped, and all hands and hearts sympathised in my new labour, since the society of hens and chickens was soon changed for that of poets, prophets, painters and lovely maidens, who all in turn have immortalized the humble little farm erection.' These words, like all her others quoted in this article, come from the twenty manuscript pages of her autobiographical fragment *Annals of my Glasshouse*, written in 1864 but not published until 1889.

Among the many 'poets, prophets and painters' who came to be photographed at Dimbola were Charles Darwin, Benjamin Jowett, Henry Longfellow, James Spedding, Henry Taylor, Tennyson, Anthony Trollope and G. F. Watts. Others, such as the writers Robert Browning and Thomas Carlyle, had their portraits taken at Little Holland House, to which Cameron sometimes took her equipment. For a select few important subjects, such as Herschel, she went to their homes. By determined application over roughly a decade, she assembled a large portfolio of fine 'close-up' portraits of male heads, virtually life size by virtue of the large negatives she used (at first 11" × 9" and later 15" × 12"), photographic equivalents of the series which G. F. Watts painted as a 'Hall of Fame and donated to London's National Portrait Gallery.

These extraordinarily powerful portraits were arguably the first 'close-up' photographs in history (had the Frenchman Nadar made larger prints, he might have had a prior claim). All taken against a totally dark background, they show only the sitters' head and shoulders, while their bodies are draped in dark cloth. Some are in profile—a rather unnatural way of looking at people. Perhaps this was prompted by the intense interest at the time in human physiognomy as an indicator of character, and the widely practised 'science' of phrenology—deducing the power and range of a person's mental abilities from the shape of the head. Cameron's remarkably virtuoso control of lighting in these close-ups—usually from the top, from one side only—certainly highlights every detail, valley and bump.

Cameron's photographs of 'maidens' are blander and less dramatic. Though she did photograph such female celebrities as Marianne North and Marie Spartali (painters), Anne Thackeray (Thackeray's daughter, a successful author in her own right) and Christina Rossetti (no print of this portrait is known to survive), it was extremely difficult for women in Victorian Britain to achieve public status in their own right. Most of Cameron's female subjects were family and friends, and her main criterion for selecting them was their beauty—especially the sort of long-necked, long-haired, immature beauty familiar in Pre-Raphaelite paintings. Two of her favourite models were maids in the Cameron household—Mary Ann Hillier (frequently seen as some Madonna or other) and Mary Ryan, an Irish beggar girl whom Cameron had taken on at least partly, it seems, because of her good looks. The majority of her female models were teenagers, though their dress often makes them look older. With such subjects, she draws her camera back from its extreme close-up position, uncovers all the windows in her glasshouse studio and makes everything softer and prettier.

The children who appeared in her photographs were often local, too. Young Freddy Gould, who was posed as several Biblical characters, including Christ, was

the son of a fisherman. With him are often seen one or more of the four children of Thomas Keown, Master Gunner at Freshwater Redoubt, the Royal Artillery fort within sight of 'Dimbola.' One of the few local men portrayed as himself rather than as a fictional character was a young artilleryman, and officers from the fort were often entertained at Dimbola, sometimes taking part in productions at 'Mrs Cameron's Thatched Theatre,' in its grounds.

Though Cameron obviously had a taste for fancy dress—perhaps partly as a result of David Wilkie Wynfield's teaching—she never seems to have photographed scenes from the plays staged in her theatre. She did take the young Lionel Tennyson in costume as the Marquis of St. Cast, a character in Tom Taylor's potboiler *Payment on Demand*, typical of the Victorian melodramas and farces she put on, despite her otherwise rather sophisticated literary tastes. The home-made settings and heightened gestures used in her literary illustrations and genre scenes have a clear affinity with nineteenth century photographs of such performances and even the first efforts of silent filmmakers two decades later.

Though Cameron had made illustrations of literary, classical and Biblical stories throughout her short photographic career, this element of her work came to an obsessive peak toward the end of that decade, when she made—at Tennyson's suggestion—a series of illustrations for his *Idylls of the* King and other poems. These were published, probably largely at her own expenses, in two large format volumes, in 1874 and 1875. Her visualisations of poetry are different in style and achievement from those of any other photographer of the time. Her contemporaries decorated books of poetry by Burns, Gray, Milton, Scott, Shakespeare and others with picturesque landscapes, occasionally peopling these with attractively disposed figures in the scenery, but rarely illustrating actual characters or incidents from the story. Cameron certainly shares some of their taste for romantic imagery, but her illustrations are tougher, often conveying strong emotions—tragic as well as romantic.

It has been persuasively argued that many of them—not just the considerable number with Biblical or religious titles—were informed by her enthusiasm for Christianity but today, when public knowledge of such stories and symbols, and of classical literature, is minimal, her pictures still have a powerful directness and emotional impact.

In October 1875, at the height of Cameron's fame, she and Charles suddenly left Freshwater to return to Ceylon. As far as we know, she photographed only one celebrity there—Marianne North, the botanical painter. Cameron did take some pictures of 'natives' as she described them (just as she had called the residents of the Isle of Wight 'peasants'). But she took relatively few, even of these, and her photographic career was almost over. In 1879 she died and—as has often been quoted—the last word to pass her lips was 'Beauty.' Whether the story is true or not, no word could have been more appropriate.

COLIN FORD

Biography

Julia Margaret Cameron was born on 1815 in Calcutta, India. An extremely energetic and talented writer and artist, in an age when it was difficult for women to achieve success in such fields, she became interested in photography in the late 1850s, and took it up seriously at the beginning of 1864, having been given a large camera by her daughter and son-in-law.

She instantly began to take a series of compelling portraits (many of them, especially those of intellectual and artistic men of the day, in extreme close-up), illustrations of Biblical scenes, and of literature. Her enthusiasm for staging scenes from literature reached its peak in two volumes of illustrations for her friend Alfred Tennyson's *Idylls of the King* and other poems, published—largely at her own expense, it seems—in 1874 and 1875. Soon after, she and her husband left England to live in Ceylon, where he owned coffee plantations. She took a few photographs there, but spent most of her time helping her husband and his family run their estates. She died in 1879.

See Also: Portraiture. Herschel, Sir John Frederick William; and Wynfield, David Wilkie.

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CAMMAS, HENRI (1813–1888)
French photographer

Henri Cammas was a typical figure of the amateur photograph. Born in 1813, he was interested in each new technique able to promote scientific progress.

This friend of Koenig Bey, the famous orientalist, decided to travel in Egypt, Syria, Palestine and Persia and asked for a mission at the French ministry for fine art in March 1859.

Accompanied by his wife and André Lefèvre, they left for Egypt in April 1859 and traveled three years long. They brought back about 200 photographs: eighty huge pictures (about 2 feet and 4 inches × 1 foot and 8 inches) and approximately one hundred other pictures, particularly using calotype technique (almost all conserved at the French national library) and wet collodion.

They also published in 1862 a report about Egypt called "La vallée du Nil, Impressions et photographies" ("The Nile valley, beliefs and photographs") where they described very precisely daily life during the travel as well as monuments, and gave advices for potential travelers.

He did not continue his photographic practice after his trip but he became member of the French photographic Society in 1863 and exploited his work for few years. Henri Cammas died near Paris, 26 December, 1888.

MARION PERCEVAL

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Exhibitions

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CANADA

The camera recorded a wide variety of subject matter in nineteenth century Canada, from the arrival of new immigrants to the country, to the construction of a transcontinental railway. As occurred in the rest of the world, the most common type of photography in this period was portraiture. Most major towns and cities had at least one permanent commercial photographic establishment or were visited on a regular basis by itinerant photographers. However, photography was also employed by the government to gather information about the largely unknown interior of the country often to the end of assessing areas for their resource value or suitability for cultivation. In this respect, the camera became a very powerful tool in the project of white settler colonization and nation building. Photographs frequently depicted Canada as vast and empty, and in need cultivation and settlement. Images of the land as limitless in both resources and opportunities, in addition to select representations of natural phenomena, operated to lure investors, settlers and travelers to the country. The depiction of indigenous peoples also entered this process with photographs reflecting the period's diverse ideas of the aboriginal as exotic, curious, savage or noble.

The first known practice of photography in Canada occurred in the year following François Arago's announcement of the daguerreotype process on August 19th, 1839. In early 1840, Hugh Lee Pattinson, an amateur photographer, is believed to have taken the first daguerreotype in the country while on a visit from England. His view of Niagara Falls was reproduced in an 1841 edition of Noël Marie Paymal Lerebours' *Excursions daguerriennes*. The first volume of this publication also included two works by Pierre-Gaspard-Gustave Joly de Lotbinière**,** a Swiss born French Canadian seigneur with property outside Quebec City. In October 1839, Joly de Lotbinière made several daguerreotypes while traveling in Greece. He continued to journey and photograph, producing in total thirty-five views of the Middle East, five of which were reproduced as engravings by Lerebours in his publications. Joly de Lotbinière's views were also published in Hector Horeau's 1849 publication *Panorama d'Egypte et du Nubie*.

The first recorded commercial daguerreotypists in Canada were two enterprising Americans, A.H. Halsey and Henry S. Sadd, who arrived in Lower Canada in September, 1840. They offered their services first to residents of Montreal, then to those of Quebec City only to leave two months later complaining they lacked the necessary amount of sunlight for proper exposures. A year later, an anonymous Frenchman, perhaps the lithographer Charles Severin (or Seweryn or Severyn, the spelling of the last name varies), also visited Quebec City, offering his services in the art of la daguerreotypie. In the same year, Montreal and Quebec City saw the arrival of Mrs. Fletcher, "Professor and Teacher of the Photogenic Art," who, with her phrenologist husband, settled in the area from August 10 to October 5, 1841. In Toronto, the artist and portrait painter Richard A. Pauling took daguerreotypes of the local citizenry. Further east, two itinerant photographers, Hodgkinson and Butters, advertised their skills as daguerreotypists in Saint John, New Brunswick in 1841. They also taught the daguerreotype process to others such as John Clow and Thomas Hanford Wentworth both of whom later opened portrait studios in the same city. In 1843, Hodgkinson and Butters recorded the "likeness" of Sam Martin, a

former slave and prominent leader of the black community in Charlottetown, Prince Edward Island.

The first known permanent daguerreotypist in Canada was the portrait painter William Valentine who operated a studio in Halifax from 1842 until his death in 1849. Valentine had also advertised his services in Saint John in 1841. His offer to teach the process resulted in the establishment of a partnership with his student Thomas C. Doane. In the spring of 1843, Valentine & Doane set up business at the Golden Lion Inn in St. John's, Newfoundland. When their partnership dissolved, Valentine remained in Halifax, and Doane moved to Montreal (by way of the West Indies) where he ran a successful business from 1847 to 1866. In Toronto, Eli J. Palmer opened a photography studio in 1849 that would continue to operate for thirty years. By the early 1850s, daguerreotype studios were established in every major city. Photographic materials, such as plates and cases, were imported, mainly from the United States. Individuals from all walks of life had their likeness recorded, from labourers to famous political figures. Other subject matter included views of cities, business establishments and natural scenery, the most popular of which was Niagara Falls.

The daguerreotype process was in general use in Canada until the early 1860s when it was replaced by the wet collodion method. This latter process was also used for the production of collodion positives, or ambrotypes, which were popular from the late 1850s to mid 1860s. By the late 1850s, commercial photography studios using the wet collodion method had become established in most major cities. The process also allowed for the production of stereoscopic views that Canadian photographic establishments began to market in the late 1850s. The production of photographic imagery using the calotype process, however, was practically nonexistent, with one known exception, which will be discussed below.

Certain works produced in the 1850s using the collodion process are crucial to the history of image making in Canada. In 1858, Humphrey Lloyd Hime (1833–1903), of the Toronto firm Armstrong, Beere and Hime, accompanied the Assiniboine and Saskatchewan Exploring Expedition to take pictures of an area now at the southern border of Manitoba and Saskatchewan. The expedition represents the first government use of the medium. Subject matter included landscape views, the inhabitants and buildings of the Selkirk settlement (near the present day city of Winnipeg), and the area's aboriginal populace. The expedition's leader, Henry Youle Hind (1823–1908), also used the photographs as the basis for illustrations in a book published on the expedition. In addition, a portfolio of thirty prints was made available for sale to the general public. Back east, from 1858 to 1860, Samuel McLaughlin (1826–1914) published small portfolios of photographic prints entitled *The Photographic Portfolio: a monthly review of Canadian scenes and scenery*. However, it appears that production of imagery was much less frequent than promised as only a dozen photographs have survived from this business venture. McLaughlin's most famous commission, begun in the early 1860s, was the documentation of the construction of Canada's Parliament Buildings, a project that earned him the title of "government photographist."

The 1850s were noteworthy for other photographic projects. In 1859, the London Stereoscopic Company sent British photographer William England to North America to create stereo views of Canada and the United States. In November of the previous year, William Notman, who will be further discussed below, began documentation of the construction of the Victoria Bridge in Montreal. The project lasted two years and resulted in forty stereo views of what was considered the greatest engineering feat in North America at the time. In the late 1850s, Henry J. Cundall produced views of Charlottetown and surrounding area using the relatively rare collodio-albumen, or dry plate process. From 1857–59, Paul-Émile Miot an officer in the French navy took photographs of the ports and fisheries of Newfoundland, Cape Breton Island and the French islands of St-Pierre and Miquelon, as well as the area's Micmac Indians.

The immense popularity of the carte-de-visite in the early 1860s fully established photography as a viable commercial activity. William Notman of Montreal capitalized on this interest, building large studios in Montreal, Ottawa, Toronto and Halifax, as well as branch companies in the United States. His title of "Photographer to the Queen" most likely resulted from his gift to Queen Victoria of over five hundred photographs of Canadian scenery housed in a silver gilded box of bird's eye maple. Notman also promoted photography as a fine art, producing two volumes of *Notman's Photographic Selections* in 1863 and 1865 that combined photographs with reproductions of paintings. His studio became famous for its elaborate interior sets of hunting and winter activities. The photograph from the Cariboo Hunting series "A Chance Shot" appeared in the May 1866 edition of *The Philadelphia Photographer* along with much adulation from the magazine's editor, Edward L. Wilson regarding its realism. Notman was also known for his large composite photographs of a variety of subject matter, the most famous being the "Victoria Rink skating carnival" (1870) which depicted a costume ball held in honour of Prince Arthur's visit to Canada in 1869. In the case of his Ottawa firm, William J. Topley opened the branch in 1867, bought the business five years later, and specialized in taking pictures of the city's well known personalities and politicians, in addition to the Parliament Buildings, monuments, and businesses. Notman's

Underwood & Underwood. Photographing New York City—on a slender support 18 stories above pavement of Fifth Avenue. *The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.*

younger brother, James, produced stereo views of St. John in the early 1870s. After Notman's death in 1891, his eldest son William MacFarlane Notman continued to run the business until his death in 1913 at which point his son Charles headed the firm until 1935, when the studio was finally sold.

Other large photographic firms of the time include James Inglis of Montreal whose work and reputation has been overshadowed by that of Notman. Inglis, who also created large composite photographs, found himself competing against Notman on a number occasions, the most controversial of which was the production of his version of the Victoria Skating Rink carnival in 1870. Jules Benoit *dit* Livernois produced daguerreotypes in Quebec City in the 1850s. Upon his death in 1865, his son Jules-Ernest took over the business and produced thousands of portraits and views of Quebec City, and its surrounding area for sale to tourists. Genre scenes depicting traditional but fast disappearing ways of Québécois life were also popular. The Livernois operated their photography business for over one hundred years, from 1854 to 1974. Also in Quebec City, Ellisson & Co. created dramatic portraits of local personages while the studio of Louis Parent Vallée specialized in views of the city and its surrounding area.

Another well-known commercial photographer, Napoleon Sarony, was born in Québec in 1821. He moved to New York around 1836 where he eventually established his famous studio several decades later.

In central Canada, James Esson operated a highly successful studio in Preston, Ontario. From the late 1870s to 1882, Esson took hundreds of stereo views of his travels throughout Canada and the United States. Other photographers who produced stereoscopic views of Canada include J.G. Parks of Montreal, W.J. Topley of Ottawa, and J.S. Climo and James McClure both of Saint John. Another important set of stereographs of Québec and Montreal were taken in 1867 by the American photographer B.W. Kilburn who, along with his brother Edward, ran the large stereoscopic firm of Kilburn Brothers of Littleton, N.H.

Commercial photography arrived on the west coast with the discovery of gold on the Fraser River in 1858. In 1859, George Robinson Fardon came to Victoria from San Francisco and produced a number of views of Vancouver Island. His panorama of Victoria was reproduced as an engraving in the 10 January 1863 edition of *The Illustrated London News*. Fardon is best known for his 1856 publication *San Francisco Album: Photographs of the Most Beautiful Views and Public Buildings*. He also specialized in pannotypes, or photographs reproduced on leather. Francis G. Claudet, the youngest son of Antoine François Claudet of London, England, pursued photography on an amateur basis while fulfilling his duties in the Assay Office in New Westminster in the 1860s. Richard Roche, a lieutenant on the survey ship HMS *Satellite*, was another amateur who took photographs while stationed in the area. Most notable are his views of aboriginal peoples, as well as American and British camps on San Juan Island taken shortly before the Americans occupied the island. Hannah Maynard settled in Victoria in 1862 where she operated her studio business for fifty years. Her husband, Richard learned photography from her and travelled extensively taking

landscape views. Charles Gentille was active in British Columbia between 1863 and 1866, taking carte-de-visite views of the Leech River gold rush of 1864, and landscape photographs of the Cariboo area a year later. In 1866, Frederick Dally opened a photographic studio in Victoria. That same year, he accompanied Vancouver Island Governor Arthur Kennedy on a trip around Vancouver Island where he obtained photographs of aboriginal villages and peoples and collected aboriginal artifacts. His best known works were produced between 1867–68 when he photographed the lives of gold miners along the Cariboo Road, many of which were reproduced for the pictorial press.

In the prairie provinces, Joseph Langevin opened his Photographic Gallery in Winnipeg in 1864. He was the first known photographer in the west to take carte-de-visite portraits. Nearly two decades later, in the same city, Rossetta E. Carr opened the American Art Gallery, a highly successful studio that specialized in the children's portraits. In the 1890s, Geraldine Moodie began her photographic career, taking pictures of the Cree Indians living near Battleford, Saskatchewan. Moodie is best known for her portraits of Inuit peoples taken while her husband was stationed in the Arctic from 1904-06, and in Dawson, Yukon from 1912–15. In Calgary, William Hanson Boorne, along with his cousin Ernest May, established a photography studio in 1886, and another in Edmonton in 1891. Boorne's most noted photographs are of the Blood Indian Sun Dance ceremony taken in 1887 and 1888 for which he received a gold medal in the 1893 Chicago World's Fair. The firm also built up a collection of scenes from across Canada that they sold to both workers and visitors along the newly constructed railway line.

The period's best-known amateur works were produced by Alexander Henderson of Montreal who created a number of artistic landscape views that he bound together and published as *Canadian Views and Studies by an Amateur* in 1865. Subsequent editions were titled differently and appear to have been personally assembled to suit the needs of the recipient. For those stationed in remote areas of the country, photography proved to be an important pastime, as well as a way of contributing to scientific pursuits. In the 1860s, Bernard Rogan Ross, a Fellow of the Anthropological Society of London, photographed the aboriginal peoples of the Mackenzie River District and the inhabitants and activities at Rupert House, a Hudson's Bay Co. trading post near James Bay. Moose Factory, located on the opposite side of the bay, also saw much amateur activity. From 1864 to 1869, Charles Horetzky produced a number of views of the area, perhaps learning the medium from Ross. In the 1870s, Horetzky joined the Canadian Pacific Railway survey teams under the direction of Sir Sandford Fleming, taking photographs of various routes proposed for the transcontinental railway. Another individual who became interested in photography while stationed at Moose Factory was James Cotter. He took numerous photographs of the Inuit, igloo building and kayaks, as well as landscape views some of which were reproduced in *The Illustrated London News*. George Simpson McTavish also photographed aspects of life in the north, as well as the hunting activities of the Inuit.

Surveyors and explorers hired by both British and Canadian Governments used photography to document their activities, and provide views of the largely unknown interior and its aboriginal peoples. Between 1858 and 1862, a corps of Royal Engineers was assigned to mark the boundary of the 49th parallel, or the border between the United States and Canada. Twenty-three photographs were taken around Victoria and Esquimalt between 1859 and 1860, and eighty-one were produced in the field between 1860 and 1861. The Royal Engineers continued their boundary survey in the 1870s. One set of photographs was used as evidence to settle a boundary dispute between Canada and the United States at the North West Angle of the Lake of the Woods in 1872. Other images depict the interior of the country, the surveying activities of the Engineers, and subject matter of particular fascination for Victorians such as views of aboriginal graves, burial sites, and the remains of aboriginals killed in tribal skirmishes. In 1871, Benjamin Baltzly, an employee of William Notman's firm, accompanied the Geological Survey of Canada expedition into the interior of British Columbia. Notman retained the negatives and sold the photographs through his studios. Such views were a novelty, as individuals living in the east knew little of the west and were curious about the area and the type of landscape found there.

George Mercer Dawson, a geologist with the Geological Survey, also took photographs in British Columbia during the 1870s and 1880s. Some of his most important historic and ethnographic pictures were taken of the Haida Indians of the Queen Charlotte Islands, which included views of their dwellings and totem poles. Edward Dossetter produced another important set of photographs of this area in 1881. The Canada-Alaska boundary, and topographical surveys of the west were achieved through photogrammetry, a photographic surveying technique which the Surveyor-General, Edouard Deville, employed on a large scale and for which he gained an international reputation. Views of Yukon and Dawson City were taken by William Ogilvie in 1895 and 1896, and depict the north prior to the immense increase in both population and mining activities that occurred as a result of the Klondike gold rush.

Photographs generated by the Geological Survey, and other government projects, were used by the Canadian government and the Canadian Pacific Railway Company (CPR) to encourage immigration. In terms of

the former, in the west, James B. Tyrell of the Geological Survey took pictures of the prairies, and the forts, aboriginal peoples, and settlers that occupied the area. In 1881, Frank Jay Haynes, a photographer of American railroads, was hired by the CPR to create photographs to entice immigrants to the country. With the completion of the CPR in 1885, William Cornelius Van Horne, then General Manager of the company, was especially eager to provide free passage on the railway to artists and photographers wishing to render views along the route. Between 1887 and 1889, Notman's son, William MacFarlane Notman, traveled along the newly build transcontinental railway to photograph scenes along the route. In the mid-1880s, Alexander Henderson also journeyed along the railway line, taking pictures of scenic areas that would later be bought by the company in order to encourage travel along the line. This was not Henderson's first project along a railway route. From 1872 to 1874 he had been hired by Sir Sandford Fleming to take photographs along the Intercolonial Railway Line, which linked, sometimes through already established lines, the Maritime provinces to the St. Lawrence River near Quebec City. In 1886, Oliver Buell took photographs along the western end of the railway line, specializing in views one would see while traveling along the route. The Canadian Pacific Railway reproduced a number of his photographs in their advertising literature, and included four works in its 1895 portfolio of photogravures entitled *Glimpses Along the Canadian Pacific Railway: Mountain Series*. Buell used his photographic views mainly for his "entertainments" or stereopticon and lantern slide shows in which he starred as the main narrator. He later traveled throughout the east, taking numerous landscape photographs in the Maritimes and New England states.

The public had access to photographic imagery not only through commercial establishments and lantern slide shows, but also through a number of technological developments that occurred in the latter part of the century. Dissemination of photographic imagery was substantially increased when, in 1869, two Canadians, William Augustus Leggo and George Edward Desbarats, reproduced the first letterpress halftone reproduction of William Notman's photographic portrait of HRH Prince Arthur for the 30 October 1869 edition of the *Canadian Illustrated News.* By the early 1880s, individuals could take their own photographs with relative ease as a result of improvements in dry plate photography. Amateur involvement in the medium increased and photographic societies and camera clubs became established across the country, beginning with the Quebec Amateur Photographers' Association in 1884. New types of cameras were manufactured which took advantage of the "instantaneous" photography the dry plate afforded. One such device was the detective camera that was employed by Captain James Peters of the Regiment of Canadian Artillery to photograph the Riel Rebellion of 1885.

The Arctic, a place of continued fascination for scientists, explorers and artists, first saw the appearance of photography in the early 1850s. Photographs were made during expeditions sent out in search of Sir John Franklin, and it is possible that the medium was included in the Sir John Richardson search expedition of 1847–49. William Henry Fox Talbot had donated a calotype apparatus to the expedition, but it is unknown whether or not the equipment ever left England. It is known, however, that attempts were made to produce daguerreotypes during Dr. Elisha Kent Kane's 1853 rescue expedition, which journeyed in the area north of Smith Sound. Francis Leopold McClintock successfully created calotypes in 1854 on Beechey Island as part of the Edward Belcher expedition. Two years later, McClintock headed his own expedition funded by Lady Franklin, which was successful in discovering the fate of the noted explorer. For the expedition, Dr. David Walker, who had been hired as surgeon and official photographer, used the wet collodion method to produce photographs of the Baffin Bay area. In 1869, William Bradford, artist, organized a cruise to the Arctic and employed two photographers, John Dunmore and George Critcherson of Boston to take photographs of areas visited. One hundred thirty five of these photographs were included in Bradford's 1873 publication, *The Arctic Regions*. Sir Allen Young headed north by steamer in 1875 along with George de Wilde, artist and photographer, some of whose work was used in the 1876 publication *Cruise of the 'Pandora.'* Young made a second trip that same year with William Grant as photographer. The British polar expedition of 1875/76, headed by Sir George Strong Nares, engaged two ships each supplied with a photographer, George White and Thomas Mitchell. In 1876, the expedition made a failed attempt to reach the pole, which, nonetheless resulted in the production of one hundred twenty one photographs. In 1884, the Canadian government committed expeditions to Hudson Bay and Hudson Strait, mainly for the reason of investigating the navigability of the waters. Robert Bell of the Geological Survey of Canada took photographs in the area from 1884 to 1885. Albert P. Low, another employee of the Survey, photographed in the Ungava Bay, northern Labrador, and Hudson Bay areas throughout the 1890s. Graham Drinkwater also produced views of Hudson Bay and Strait in 1897 while engaged on the William Wakeham expedition. By the end of the nineteenth century, photography had proved its usefulness to scientists and government officials who would continue to employ the medium in the following century as a means to establish Canadian presence, and thus sovereignty in the north.

ANDREA KUNARD

See Also: Arago, François; England, William; Wilson, Edward Livingston; Sarony, Napoleon and Olivier François Xavier; Claudet, Antoine-François-Jean; Royal Engineers; and Talbot, William Henry Fox.

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CANEVA, GIACOMO (1813–1865)
Italian photographer and painter

Giacomo Caneva was born at Padua in 1813. In 1834 he went to Venice to attend the *Accademia di Belle Arti*, where, in particular, he followed the School of the Perspective of Tranquillo Orsi. Here he qualified as a "perspective painter," and widened his knowledge of the camera obscura, which he used in his paintings. Some of his paintings survive from this period: two canvases painted at Rome, which today are in the Museo Civico at Padua (a view of the Pantheon, commissioned by Jacopo Treves in 1843, and a view of the temple of Vesta in 1844), and a canvas in a private collection representing the Prato della Valle of Padua. He went to Rome to paint just before daguerreotypes came out. In 1840 and 1841 he superintended the works carried out at the Villa Torlonia after the project of Giuseppe Jappelli, and obtained a modest success. A couple of contemporary chronicles attest his presence at Rome and mention him as being ingenious, enterprising, and interested in new things (N. Pietrucci, 1858; N. Roncalli, 1844–1870). On the 14th of February 1847 he went up in a balloon with François Arban, who had come to Rome that year after making several ascents in Italy and other parts of Europe. In a letter to friends Caneva recounts his ascent and gives a marvellous description of the panorama of Rome and the surrounding countryside (A. Ganot, 1864). He went up again two months latter from the Villa Borghese with Arban and the Venetian painter Ippolito Caffi. His innate inclination for novelty awakened an interest in photography immediately after its invention. He began his photographic career as a daguerreotypist, according to notes left by his friend Tommaso Cuccioni, who later became a photographer himself. However, as things stand at present, his daguerreotypes cannot be individualized. He is recorded in the famous list of artists' addresses which was begun at the Caffè Greco in 1845: "G. Caneva, Painter and Photographer, Via Sistina 100," and then, "Via del Corso 446, near S. Carlo."

Quite early on, Caneva combined practice with theory, and in 1855 wrote *"Della fotografia, trattato pratico di Giacomo Caneva, Pittore prospettico" (A practical Treatise on Photography by Giacomo Caneva, Perspective Painter"),* in which he reveals a detailed knowledge of techniques such as the calotype process. The daguerreotype process now seemed to him to be obsolete, indeed superseded by the superior calotype process, by which many positive copies could be printed from just one negative. Paper photography is then described in all its variations: the method of W.H. Fox-Talbot, the improvements of Blanquart-Evrard, Gustave Le Gray, Humbert de Molard, Ghillon Saguez, and those of S.Geoffray. The greater part of Caneva's photographs that have survived are calotypes. In Italy there is the Caneva collection of the ICCD, the *Istituto Centrale per il Catalogo e la Documentazione* at Rome and that belonging to the Museo della Fotografia Fratelli Alinari at Florence; in Spain there is the Bernardino Montanés collection at Saragossa. In his treatise of 1855 Caneva shows his acquaintance with the albumen process on glass invented by A. Niépce de Saint Victor, and the damp collodion process on glass invented

Caneva, Giacomo. Barefoot girl leaning on basket with a doll.
The J. Paul Getty Museum, Los Angeles
© The J. Paul Getty Museum.

by F. Scott Archer. In the same year he published the album *Vedute di Roma e dei contorni in fotografia (Photographic Views of Rome and Surroundings)*. He also took many important photographs around Naples, which show stupendous panoramas of the sea, Vesuvius and the ruins at Pompeii.

The magazine *L'Artista,* published in Milan in 1859 by Luigi Sacchi, one of the foremost photographers from the beginning, gives details of a grand enterprise inwhich Caneva took part, a journey to India and China. The "famous Caneva of Rome," was the photographer chosen by the silk firm of Castellani and Freschi to participate in an expedition to seek new silkworms untouched by disease. Of the pictures he took on this expedition there remain only a few engravings taken from the photographs, (G.B. Castellani, 1860), a salted paper in the collection of Piero Becchetti at Rome, and the relative calotype in the ICCD at Rome.

In 1864 Caneva was paid to revise the inventory of the photograhic material in the studio of his friend Tommaso Cuccioni, who had died a short time before. Caneva himself died in the following year and is buried in cemetery at Campo Verano.

His activities at Rome are bound up with those of many other artists and photographers who frequented the photographic circle that emerged at the Caffè Greco in Via Condotti shortly before 1850, the so-called "Roman School of Photography." Other members were the sculptor and medalist Frédéric Flachéron, Eugéne Costant and, for a short time, the goldsmith Augusto Castellani and Ludovico Tuminello. The earliest photographs of the "Roman School" are those of Costant and Flachéron datable to 1848, except for one view of the piazza Bocca della Verità, which is signed and dated "G. Caneva 1847." Thus Caneva has the merit of having taken the first calotype to attest the activity of this Roman circle, which was very important for the diffusion of calotypes in Italy. From the beginning he and other Roman friends devoted themselves to taking photographs of the monuments of Rome, using the knowledge they had acquired in their studies of design and perspective. These views reveal their confident mastery of the calotype technique, after the method of Gustav Le Gray, their strict attention to illumination, the relationship between light and shade, and the correct angle for perspective. As well as these pictures of the most important places in Rome, he took photographs of events such as religious and popular festivals, and scenes of everyday life. For the Vatican he took important photographs of statues, of which the most outstanding are those of the Laocoon and the Torso of the Belvedere. He also took several views of the Musei Capitolini, the Museo Albani and the Museo Ludovisi at Rome. His views of the surroundings of Rome and those taken at Tivoli are splendid. These exalt different parts of the beauties of nature, such as trees, ruins, rocks, peasants' huts, and rivers, views that were certainly in demand by many painters working in Rome. From 1852 he systematically took photographs for artists, using the calotype process precisely because it was able to reproduce to whole range of lighting effects of the countryside with delicate gradations of tone. His studies of nature are the first examples of the genre and thus precede the later popularity of such views, which spread throughout Europe. The extremely high quality that he achieved is due to the use of very large apparatus instead of the daguerreotype machines that he had at the beginning of his career. The continuing refinement of expression, obtained through his increasing mastery of the medium, and his continual updating of technical equipment gave him at the height of his career results of great originality, in which the determining role was played by his own creative gifts and his previous train-

ing as an artist. None of his photographs taken after 1860 remain, and nothing is known of his last years. However, his surviving photographs are the work of one of the greatest Italian photographers from the inception of photography in Italy.

SILVIA PAOLI

Biography

Giacomo Caneva was born at Padua on the 4th of July 1813 of Giuseppe Caneva and Anna Pavan. There were four other children, Antonio, Giovanni, Camillo and Teresa, who died as a child. The father was well-to-do, and was the owner of the "Albergo al Principe Carlo" in Prato della Valle. Caneva left Padua on the 12th of November 1834 to register at the Regia Accademia di Belle Arti at Venice (Royal Academy of Fine Arts). Here he took courses in perspective, ornamentation and decoration, and developed his knowledge of perspective, which played such a large part in his work as a painter and photographer. After he had finished his studies he went to Rome, perhaps with the help of a grant, to perfect his technique. Here he soon achieved recognition for his works at Villa Torlonia which were carried out in 1840 and 1841 by the architect Giuseppe Jappelli. With the discovery of the dagueurreotype process Caneva began his career as a photographer, but then decided to use mainly the calotype process. He became one of the leading members of the "Roman School of Photography"; his studio was first in Via Sistina 100 and then in Via del Corso 446, near S. Carlo. Among his preferred subjects were the statues in the Musei Vaticani, the monuments of Rome and surroundings, and the countryside in Lazio and Campania. In 1859 he went to China and India, and there remain some engravings taken from his photographs of that journey. He died in Rome on the 29th of March 1865.

See Also: Talbot, William Henry Fox; Blanquart-Evrard, Louis-Désiré, Le Gray, Gustave; Humbert de Molard, Baron Louis-Adolphe and Geoffray, Stephane.

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CAPEL-CURE, ALFRED (1826–1896)
English photographer

Colonel Alfred Capel-Cure was born in 1826, a soldier and gentleman who was among the first generation of amateur photographers. He owned Blake Hall in Essex, and later inherited Badger Hall, Shropshire, in 1884 from his uncle Edward Cheney, whose brother, Robert Henry Cheney, was also an amateur photographer. He worked with paper negatives and salted paper prints in the 1850s. His subject matter included his home, Blake Hall, medieval architecture and ruins in England, Wales, and Scotland, as well as France. Additionally he photographed soldiers in the 55th Regiment at Templemore and Athlone in Ireland. He also made prints from the negatives of his uncle, Robert Cheney, in 1859–60, which are in the Horblit Collection at the Houghton Library, Harvard University and the Center for Canadian Architecture, Montreal. Examples of his work can be found in the collections at the Getty Museum, Los Angeles, and the Center for Canadian Architecture, Montreal. He died in 1896.

DIANE WAGGONER

CARABIN, FRANÇOIS-RUPERT (1862–1932)

François-Rupert Carabin, sculptor and cabinetmaker, first worked as craftsman for a sculptor within the Faubourg Saint-Antoine in Paris. He was then familiar to Montmartre, its cafes and cabarets. In the *Chat Noir* he met Henri Toulouse-Lautrec and Adolphe Willette. Along with Toulouse-Lautrec he became a close observer of Montmartre brothels looking at "fallen women" with both tenderness and acuteness. He chose all his models among them. Most of his sculptures and pieces of furniture had been inspired by the female body (see for instance the bookcase designed in 1890 for Henry Montandon, now kept at the Musée d'Orsay). He went beyond mere realism; under his chisel women became mermaids, sphinx. As a critic wrote on Carabin's works, his sculptures show a "daring perversity."

Carabin made from 1895 many photographs of his nude models in his studio. The albumen prints are closely related to the artist's work in decorating furniture. Their poses are charged with some erotic crudeness. The many girls who posed for Carabin did not always have the charm of his sculpted women or they voluptuous curves. Anyhow, with no doubt put at ease by the sculptor and full of the banter of young models in Montmartre, they freely strike the same poses with a naturalness that shines trough the photographs.

> The whole collection is kept at the Musée d'Orsay. They came there through the Fondation Le Corbusier as the artist's heirs had given them to the architect—who met Carabin just before World War 1—in 1953. Carabin's photographs make a rare set that gives insight into the use of photographs not only as models but as preliminary sketches for other works. Most of the view were not taken any further, but remained as projects or ideas.
>
> DOMINIQUE DE FONT-RÉAULX

CARBON PRINTS

Carbon printing developed from the need for a permanent photographic positive process, and derived from principles established by Gustav Suckow. In 1832, he noted that an alkaline chromate (potassium dichromate) reacted with sunlight to harden organic matter. Potassium dichromate is a bivalent chromium compound, which is reduced by exposure to light to a trivalent chromium compound. This in turn acts on organic colloids, producing a kind of polymerisation. In 1839, Mungo Ponton identified the photo-sensitivity of potassium dichromate, and in 1840, Edmond Alexandre Becquerel observed a greater photo-sensitivity when paper was sized with plant starch. This work established that an organic, water-soluble colloid (such as starch, gum arabic, gelatin, or albumen), when sensitised with potassium dichromate and exposed to actinic light, becomes insoluble in water. The discovery was first applied to photomechanical printing, as William Henry Fox Talbot's photoglyphic engraving process (patented 1852) and Alphonse Poitevin's photolithography process (patented 1855). In 1855, Poitevin also patented a direct pigment process using dichromated gelatin. By 1858, John Pouncy, J. C. Burnett, and Charles Cowper had all produced modifications, and in 1859, Emma Heineken achieved better tonal gradation by substituting finer pigments.

Poitevin's process used a mixture of lamp black pigment and gelatin coated onto paper (often called the carbon 'tissue'), and sensitised with potassium dichromate. The unexposed gelatin dissolved in water, leaving the hardened exposed areas as a pigmented gelatin layer that could be dried *in situ* or transferred onto another support surface.

In 1864, Joseph Wilson Swan patented a transfer method of processing the carbon tissue, allowing the removal of the top layer of hardened gelatin to give a finer tonal gradation. Adolphe Fargier had already patented a double-transfer process in 1860, but Swan attained his patent, and by 1866 was offering carbon prints through Mawson and Swan (see Mawson & Co.). Swan later sold the rights to Adolphe Braun, Edgar Hanfstaengl (see Franz Hanfstaengl), and T. and R. Annan (see Thomas Annan), among others.

In 1878, a new carbon paper was produced by Frédéric Artigue. As 'Artigue papier velours,' it had limited use from 1884. It was modified by Artigue's son and reintroduced in 1893 as 'Charbon-Velours' paper. Artigue paper was sensitised, exposed, and developed from the front surface, without the need for transfer onto a secondary support paper. The 'development' was effected by sawdust suspended in water, which abraded the pigmented gelatin coating, removing unexposed areas and leaving a velvety matt surface. The same method of development was later used for the Fresson process.

In 1868, Louis Ducos du Hauron patented a subtractive colour system from separation negatives, producing three-colour photographs with superimposed layers of pigmented gelatin. With the introduction of panchromatic materials in 1906, carbon was adapted for trichrome prints, and combined with Thomas Manly's ozobrome process as carbro, a dye imbibition process (1919).

Carbon was largely directed towards the commercial market of art reproductions and professional portraits. The main British supplier of materials and finished prints was the Autotype Fine Art Company, which acquired Swan's patent rights in 1868. Other firms included John Pouncy's Dorchester establishment, Liesegang (see Paul Eduard Liesegang), Goupil et Cie., the Woodbury Permanent Photographic Printing Company (see Walter Bentley Woodbury), the Scovill Manufacturing Com-

pany (see Scovill and Adams), and Hanfstaengl, which, as Hanfstaengl-McGraw, continues to produce carbon, carbro and photomechanical materials.

Carbon prints were made to look very like silver photographs; the tissues were made in brown and purple pigments to mimic the hues of albumen prints. In the late 1880s and 1890s, when silver prints were increasingly neutral black in colour, tissues were available in 'engraving black.' The process produces a fine, continuous tone image without a grain structure, for the tonal gradations are produced by the varying thickness of the pigmented gelatin layer, visible as a slight surface relief. Prints usually have a satin finish, although those made by single-transfer show a glossier appearance (especially in the shadows) than do double-transfer versions. The smooth surface more successfully reproduced image detail, but an increasing preference for a matt finish encouraged the adoption of Artigue carbon paper, although the crude half-tones limited its use until the 1890s, when roughness of image definition was more appreciated.

By 1875, selective development was being proposed for modifying half-tones. Because the 'development' of a carbon print consisted of soaking it in warm water to dissolve the unexposed areas of pigmented gelatin, longer soaking and local manipulation would remove some of the areas of tone and detail. In the 1890s, pictorial photographers used this method to produce a more 'painterly' effect.

Permanent, non-silver photographs were advantageous at a time when albumen silver photographs were notorious for their instability. As a pigment, rather than chemical, imaging process, the colour and density of the carbon print were highly predictable and not dependent on vagaries of exposure, development, toning, etc.. Carbon was a superior process for reproduction, as it transcribed images without intrusive grain. However, it was time-consuming and labour-intensive, being only practical in commercial production when economies of scale could be realised, as at Adolphe Braun's pigment printing works, which were the largest in Europe. Braun published art reproductions from 1866, and improved the process, using finer pigments in a wider range of colours to approximate more closely the hue and tonal range of the original works of art.

Few photographers had the time or space to make their own carbon prints, but a number of companies printed to order. In 1867, Mawson & Swan advertised carbon prints of photographs by Francis Bedford and Valentine Blanchard, and by 1874, P. & D. Colnaghi were selling carbon editions of Julia Margaret Cameron's photographs. Exceptionally, James Craig Annan produced carbon prints of his own photographs (exhibited 1896), an endeavour facilitated by his family's printing works (his father, Thomas Annan, established T. and R. Annan).

HOPE KINGSLEY

Biography

In 1832, Suckow, reaction of organic colloids to alkaline chromates; 1839, Ponton identified photo-sensitivity of potassium dichromate; 1840, Becquerel, insolubility of organic colloids sensitised with potassium dichromate; 1855, Poitevin, pigmented gelatin photographs; 1860, Fargier, double-transfer process; 1864, Swan; improved transfer process; 1868, Ducos du Hauron, trichrome carbon process; 1878 and 1893, Artigue, direct print without transfer.

See Also: Talbot, William Henry Fox; Dry plate negatives: Gelatine; and Braun, Adolphe.

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CARBUTT, JOHN (1832–1905)

American photographer and manufacturer

John Carbutt, landscape photographer and Philadelphia photographic manufacturer, was born to mason Robert Carbutt and wife Ann on 2 December 1832 in Sheffield, England. Pioneer photographer of the American West, inventor, and innovative manufacturer of dry plate and X-ray technology, Carbutt began his trade as a field photographer for the Grand Trunk Railway in Canada during the mid 1850s. From 1861 to 1868 he operated a photographic studio in Chicago where he issued stereographs of the frontier and newly constructed railroad infrastructure between the Mississippi River and the Rocky Mountains. In the 1860s he experimented with magnesium light, the portable dark tent, the solar camera, and woodburytypes, which he manufactured

commercially as the Superintendent of the American Photo-Relief Company in Philadelphia in 1870. Beginning in the 1870s Carbutt became the president of professional photographic organizations including the Photographic Society of Philadelphia (1875), the Photographer's Association of America (ca. 1879), and the Dry Plate Manufacturing Association (1884). In 1879 he introduced the first commercially successful dry plates in America, followed by the first orthochromatic dry plates in 1886. In 1895, Carbutt began to experiment with and manufacture X-ray plates to reduce the exposure time for radiography. On 26 July 1905 Carbutt died, following several years of poor health, possibly as a result of his X-ray experiments.

LINDA WISNIEWSKI

CARD PHOTOGRAPHS: MINOR FORMATS

Card photographs are comprised of paper photographic prints pasted to a larger sheet of cardboard, often called a card or mount. The majority of 19th century paper photographs were card photographs, and they were popular into early 20th century. Card photographs come in a variety of formats. The different formats often resemble each other, but differ in size of mount. There is wide variety of lesser known and often obscure formats. Some of the most obscure formats were marketing gimmicks. Many card photographs come with the photographer's stamp on the back and/or front. The majority of 19th century card photographs used albumen prints, though other types of prints will be found. Most 20th century card photographs were gelatin-silver prints. Most of these were standard commercial formats, marketed to photographic studios.

The United States Library of Congress catalogs the following listing as some of the more common card photographs. Many other formats can be found, including unique designs made by a photographer. The listed size is for the card and not the photographic print which usually will be smaller.

- Cigarette card—2¾ × 2¾ in.; 7 × 7cm. Popular era, 1885–1895. To promote sales, cigarette cards were inserted in boxes of cigarettes and other tobacco products. The photographic print was albumen and usually is the same size as the mount and depicts popular subjects including actors, athletes and other celebrities. They will also contain advertisement for the tobacco brand. In addition, there were cigarette cards that were non-photographic, most often printed with colorful lithography.
- Kodak card—4¼ × 5¼ in.; 10.8 × 13.3 cm; 1880's (photograph is circular). These were the first Kodak 'snapshots'
- Boudoir card—5½ × 8½ in.; 14 × 21.06 cm; 1890's
- Swiss card—6½ × 2.85 in.; 16.5 × 7.3 cm
- Imperial Cabinet Card—7 × 10in.; 17.8 × 25.4 cm; 1890's. The Imperial Cabinet Card became most popular in the early 20th century.
- Promenade card—7½ × 4 in.; 19 × 10.2 cm
- Paris card—9¾ × 6¾ in.; 24.8 × 17.1 cm
- Panel card—13 × 7½ in.; 33 × 19 cm

After 1906 mounted photographs were still made and were in a variety of sizes, but there was no longer the standardization of sizes or names.

DAVID RUDD

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CARJAT, ETIENNE (1828–1906)

Like numerous other photographers, Etienne Carjat's (1828–1906) entry into photography was through caricature. A fascination with celebrities and physiognomy in nineteenth-century France greatly contributed to the overwhelming popularity of the art of caricature. Daily and monthly journals were filled with portraits of political and cultural leaders, often with enlarged heads and small bodies. Though altered, these figures were recognizable by the humorous emphasis on carefully selected, exaggerated physical attributes. Carjat began creating caricatures of the actors of the Parisian theaters in the 1850s, turning his passion for the theater into a lucrative enterprise. In 1854 he published a series of lithographic caricatures representing the principal actors of Paris. The first installment appeared under the name *Le Théâtre à la Ville*. Each image was accompanied by an amusing quatrain. Carjat later reproduced these caricatures as cartes-de-viste and the photographer Pierre Petit reproduced the same images in a larger format.

Experiencing a good deal of success with his caricatures, Carjat chose to abandon industrial design. He began to create illustrations for *Presse Théâtrale* and founded the journal *Diogène Portrait et Biographies Satiriques des Hommes du XIXième siècle* with his friend Amédée Rolland. Appearing each Sunday from August 20, 1856 to April 26, 1857, the double-paged sheet was illustrated with a portrait which was accompanied by a biography. He often used the photographs

of A.A.E. Disdéri and Mayer & Pierson as study tools for his caricatures. Carjat established a solid reputation as a caricaturist after spending extended periods of time between 1855 and 1861 in the south of France in Lyon, St. Etienne, Marseille, and Eaux de Bade. Many of his caricatures were published in the Marseille newspaper *Phocéen* as well as in the revived *Diogène.* Despite his success, he was often in financial trouble, consistently losing his money at the roulettes.

Carjat returned to Paris in 1861 and on December 1, 1861 he published the first issue of a weekly journal called *Le Boulevard*. With a more literary formula than *Diogène*, it included a Parisian column, an ongoing story in installments, a musical column, and a gossip column. The journal was in a folio format of eight pages illustrated by two large portraits. Collaborators on *Le Boulevard* included many of the luminaries of Parisian culture including Charles Baudelaire, Gustave Flaubert, Victor Hugo, Champfleury, Jules Verne, Léon Claudel, and Honoré Daumier. *Le Boulevard* challenged the government's tolerance for criticism, particularly when it published extracts of Victor Hugo's *Les Misérables* between April 6 and July 6, 1862. The last issue came out on June 14, 1863 covered in black, a symbol of mourning. Carjat was financially ruined by the demise of *Le Boulevard*.

Around the same time that he founded *Le Boulevard* Carjat also opened a photographic studio at 56, rue Laffitte where he was to remain until 1865. He had previously apprenticed in Pierre Petit's studio in his branch in Stephanienbad and had practiced photography in Baden. Focused entirely on portraiture, Carjat broke with several established photographic practices of the time. Firstly, he worked on his own without the aid of assistants. He sought to show his subjects in natural poses and did not use numerous props such as tables, columns, ottomans, or prayer stools. He did make some exceptions for women who he would often show leaning on a table or seated in a chair, but with very few accessories. Carjat, along with Nadar, was one of the first photographers to use collodion before the process became massively commercialized. Producing cartes-de-visite and larger format portraits, he stuck to a rigorous composition for his photographs. The image would stop at the knees in order to highlight the subject's face and expression. The sitter generally faced the camera directly adding to the intensity of the image. Carjat's various enterprises were frequently interrelated. For example, he began advertising his photographs at special prices to subscribers of *Le Boulevard* in its very first issue.

Carjat chose not to photograph the bourgeoisie which was a very powerful and willing market for photography. Rather, he photographed painters (Gustave Courbet, Jean Baptiste Camille Corot), sculptors (David D'Angers), poets (Charles Baudelaire, Paul Verlaine, Arthur Rimbaud), writers, (Victor Hugo, Emile Zola)) politicians (Léon Gambetta, Jules Grévy), doctors, journalists, actors (Frédérick Lemaître, Rossini, Dubureau fils) and actresses (Adélaide, Sarah Bernhardt), as well as members of the *demi-monde.* Many of his subjects were his friends who frequented his studio, a favorite social gathering place known for its momentous parties. A number of Carjat's portraits were published in *La Galerie contemporaine*, a publication that focused on the most celebrated personalities of the time. Another aspect of his body of work were a series of the Communards of 1870 in their uniforms. Though Carjat does not seem to have participated in the 1870 Commune, he does appear to have aligned his sympathies with the Communards, helping a number of them and their families after the uprising.

Carjat enjoyed some public recognition through the exhibition of his photographic work. He submitted works to the Marseille Photographic Society exihibition of 1861 as well as to the London 1862 International Exhibition where he was awarded an honorable mention. His work at the 1867 Paris Universal Exposition was awarded a bronze medal. He also exhibited in London in 1861, in Paris in 1863 and 1864, and in Berlin in 1865.

Like his journalistic endeavors his photographic business had great ups and downs. His business at 56, rue Laffitte was dissolved on March 1, 1864 and reconstituted on July 14, 1864. He was forced to declare bankruptcy in June 1865 and sold the business. He perservered nonetheless and set up new studios at 62, rue Pigalle (formed in 1866 and dissolved in 1869) and then at 10, rue Notre Dame de Lorette (from early 1870 until the late 1870s). Carjat continued to write articles and poetry which were published in *La Gazette de Paris*, *Le Figaro*, *L'Evènement*, and *Le Nain jaune*, among others in the last decades of his life. He published a book of poetry entitled *Artiste et citoyen.* He died in 1906. A large body of his work was inherited by his daughter who bequeathed it to a Mr. Lemary who sold it to a Mr. Roth in 1923. Much of his work, the glass plate negatives, in particular, have been lost or destroyed.

CAROLYN PETER

Biography

Etienne Carjat was born on 1 April 1828 in L'Ain in the village of Fareins. The son of a concierge and an employee at a silk factory, Carjat moved with his family at age ten to Paris. His artistic education was comprised of three years as an apprentice for industrial designers of carpet and wallpaper under the direction of a Mr. Henri at the Cartier silk factory where his mother worked. As a young man Carjat took a great interest in the theater often spending his Sundays frequenting the

Parisian theaters. He performed in comedies at l'École Lyrique de la Tour d'Auvergne, but reportedly did not show a great deal of talent. He also wrote two dramas, *Le Pêcheur d'Amalfi* and *Les Martyrs de l'Autriche*. He took up caricature in the 1850s, illustrating figures of the Parisian theater world at first. His reputation grew and he enjoyed enough success that he was inspired to found several journals including *Diogène* and *Le Boulevard* which combined caricature with literature and cultural and political gossip. His interest and involvement with photography was a natural evolution from caricature. He opened his first studio in the early 1860s. His photographic work was exclusively portraiture in carte-de-visite and larger formats, focusing on figures in his circle such as writers, artists, and actors. He also photographed well-known political figures as well as the Communards of 1871. Though he gave up photography in the late 1870s, he continued to write articles and poetry until the end of his life. He died in 1906. The location of much of his photography is untraceable after being sold to a Mr. Roth in 1923.

See Also: Cartes-de-Viste; Petit, Pierre; Disdéri, André-Adolphe-Eugène; Mayer & Pierson; Nadar (Gaspard-Félix Tournachon); Wet Collodion Negative; and Wet Collodion Positive Processes.

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CARRICK, WILLIAM (1827–1878)

Professional photographer

William Carrick, known in Russia as Vasiliy Andreevich Carrick, was born on the 31st of December in 1827 in Edinburgh, Scotland, into the family of a merchant. His father purchased wood from Russia and so due to business necessities, the family moved to Kronshtadt in 1828. Carrick spent nearly all his life, from his childhood, in Russia. Upon finishing school in St. Petersburg he entered St. Petersburg Academy of Art. He graduated from the academy in 1850 with and art degree. Among his teachers in the academy one could name Alexander Broullov, Karl Broullov's brother, and other outstanding Russian artists.

In 1853 he left Russia for Rome to continue his artistic education. In 1856 Carrick returned to Russia. This was the moment of strained circumstances for his family due to his father's death and because of some unsuccessful financial plans the family carried out in the course of Crimean War. Carrick was faced with the problem of having to choose the field of work that would allow him to provide for his family.

In the 1850s there were a lot of photographic studios in St. Petersburg as well as in other towns all over Russia. It was caused by Andre Disderi, a French photographer, who started to make cartes de visite, and since then demand for the photographs soared. Photography became not only a fashionable but also a profitable business.

Carrick made up his mind to become a professional photographer and in 1857 he left for Edinburgh to study the technology of photography. There he became acquainted with the photographer John McGregor, who became his associate.

In 1859 they open a photo-studio on the upper-floor of a building in Malya Morskaya street in the center of St.Petersburg. Carrick started by making photographic portraits and thus gained experience with the technology of studio photography. In 1860, Carrick started to make photo-reproductions of works of art. He worked out a unique technology of a more exact reproduction of a coloured image in black and white. For that he used specially developed photographic emulsion. He made reproductions of paintings by the Academy of Arts graduates, which were then sold in St. Petersburg.

After a while he became interested in making photographs of village and city inhabitants especially those belonging to the lower social classes. For the traditional, patriarchal society of Russia where serfdom was abolished only as recently as 1861, the topic of peasantry had a key position in the works of prominent and progressive men of art. The image of a peasant could be found in literature, music, and painting. One would encounter the peasant in the works by Alexander Pushkin, Ivan Turgenev, Mikchail Glinka, Alexei Koltsov and many other outstanding figures in Russian culture. The image of common people was tackled by a Russian artist Alexei Venetsianov who looked for the harmony in the beauty of traditional ways of living and the beauty of Russian nature. The followers of Venetsianov even formed a trend in the Russian paintings of 1830–40s; they introduced into painting the characters of town handicraftsmen, peasants, etc., by providing the viewer with an insight into the way such people lived.

The technical restrictions of wet collodion outdoor

photographic process at first made Carrick confine himself to working in a studio. He made photographs of various city types, staging scenes of folksy lives in St. Petersburg. In particular, since 1860 he made photographs of water-carriers, haberdashery salesmen, carriers, etc. As time passed, Carrick started to work in the streets of St. Petersburg and its suburbs, which turned out to be a rehearsal for future trips abroad. In 1862 he made a series of ethnographic cartes de visite "Russian Types." He received for this series, as a present from Tsarevitch Nikolai, the son of emperor Alexander II, a diamond ring. This success made him and his studio very popular.

Carrick never stopped making ethnographic photographs as he saw in such kind of works an independent artistic value. In 1871 he made a trip to Samara, Simbirsk and the Saratov regions where he concentrated on life scenes of the peasantry. There he carried out a large-scale ethnographic photographic session. 1872 was a year of hard blows to Carrick for in this year McGregor, his associate died.

In 1875 however he already made another long trip with his new assistant. He traveled over Yaroslavl, Tver, Kostroma, and the Kazan regions all the way down the Volga river, and up to Nizhni Novgorod. Carrick's photographs reflected the way of life for Russian peasants in their natural setting however, Carrick always remained an artist in his work. He created artistic compositions by means of choosing the landscape, vantage point, and arranging the ethnographic groups. Carrick recorded not the dramatic social conflicts, but the true poetry of the Russian village and the Russian nature. Still, his staged scenes contain the traits of peasant's life, which makes his material a valuable source of ethnographic and social information.

In the course of his trip Carrick made over 800 photographs. The bulk of these works were purchased by the Public library following the initiative of a prominent art critic and historian Vladimir Stasov. The latter distinguished in these works a most valuable source of culture-specific material. Stasov created a collection of photographs by different photographers, including Carrick, in the Public library and then he gave the genre-specific photographs to artists for them to use as images to paint.

In 1872 Carrick's works won a silver medal at the Polytechnic exhibition in Moscow, and in 1873 Carrick exhibited his works at an international exhibition in London through the first appearance of the fifth department of the RETS. In 1876 Carrick was awarded the title of Academy of Arts photographer. Then in 1878, he died suddenly in St. Petersburg.

Creative works by Carrick were highly regarded by his contemporaries. It was written in his obituary that one of the most outstanding Russian photographers had died. Even the outstanding figure in photography, Vyacheslav Sreznevsky, believed that Carrick's works were there to prove the true meaning and the true idea of photography. Today we can say that he was one of the first to begin the development of the ethnographic fundamentals of photography through his images of the life within Russian villages. His creative legacy laid the basis for publicist reports on rural life, similar to those of Maxim Dmitriev's.

Today it is obvious that the main interest and theme of the Russian peasant in the Russian culture is being revived. In 2005 the State Russian Museum organized important exhibitions in Moscow and in Saint-Petersburg entitled the Peasant World in Russian Art, where the objects of painting, sculpture and decorative arts were presented. Carrick's work was an integral part of this cultural heritage of Russia.

ALEXEY LOGINOV

Biography

William Carrick was born on the 31st of December in 1827 in Edinburgh, Scotland. In 1828 the family moved to Kronshtadt. He graduated from the academy in 1850 on receiving an art degree. Since 1853 and up to 1856 continued his artistic education in Rome. In 1857 he left for Edinburgh to study the technology of photography. There he became acquainted with a photographer John McGregor, who later became his associate. In 1859 they opened a photo studio in St. Petersburg. Carrick made reproductions of paintings by the Academy of Arts graduates.

From1860 Carrick made studio portraits of city types staging some scenes from the life of the peasants in St. Petersburg, often photographing water-carriers, haberdashery salesmen and others. In 1862 he made a series of ethnographic photographs "Russian Types" the size of a business card. In 1871 he made a trip to Samara, Simbirsk and Saratov regions where he conducted a large-scale ethnographic photographic tour. In 1872 Carrick's works won silver at a Polytechnic exhibition in Moscow. In 1876 Carrick was awarded the title of Academy of Arts photographer. He died suddenly in St. Petersburg in 1878.

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CARTE-DE-VISITE

The *carte-de-visite* was one of the most popular photographic formats of the nineteenth century. It consisted of small portrait photograph, around 9cm by 6cm, pasted onto a slightly larger piece of card. *Carte-de-visites* derived their name from the fact that their size gave them the appearance of a visiting card, a purpose for which it was rarely, if ever, used.

The advent of the *carte-de-visite* in the late 1850s was keyed into photography becoming a public and a commercial media. It was a format ideally suited for the dissemination of celebrity images and for the collection of pictures of friends and family in photograph albums.

There is no single origin for the *carte-de-visite*. Sir David Brewster claimed that the idea originated with the Duke of Parma in 1857, who had his portrait gummed onto his visiting cards. However, as early as 24 August 1851, a humorous article in *La Lumiere* included a suggestion by Louis Dodero, an enterprising Marseilles photographer, that photographs could be placed on engraving calling cards. A similar suggestion also appeared in the American *Practical Mechanics Journal* in 1855, while Hugh Welch Diamond claimed that he used a comparable format to present an equestrian photograph to Queen Victoria in October 1852.

The *carte-de-visite* was patented by the French photographer, André Adolphe Eugéne Disdéri, on 27 November 1854. The terms of his patent emphasise the commercial impetus driving the invention of the *carte*; "In order to render photographic prints practical to commercial needs, it would be necessary to diminish greatly the cost of production, a result which I have obtained by my improvements" (Patent no. 21502). Instead of one large collodion plate being used for a single photograph, the ingenuity of Disdéri's design was that it he exposed ten images on one plate. Each individual *carte* was hence reproduced at a fraction of the cost previously incurred for one full-plate picture. Having ten pictures upon one plate also dramatically increased the potential to reproduce a large number of pictures in a short space of time, a significant factor in being able to supply a large consumer market.

Disderi's original patent was slightly modified after eight images was found to be a more practical number. In March 1860, a Parisian optician, Hyacinthe Hermagis, constructed a four lens camera that became the standard equipment used for *carte* portraits. The common rate charged in France was 30F for 25 cartes with two poses, 50F for 50 cartes with three poses, and 70F for 100 cartes with four poses. In Britain, top quality celebrity *cartes* during the 1860s sold for around 1s6d.

Deveria, Jacques-Jean-Marie-Achille or Charles-Theodule. Portrait of a Boy.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

The rise of the *carte* was instrumental in turning photography into a mass medium. It also helped to dramatically increase the number of photographic studios. A rage for cartes caught on in late 1858 in France and quickly spread to the rest of Europe. With the pleasure of seeing photographs of family, friends and celebrities, often for the first time, collecting cartes became the latest social fashion. In October 1861, the *Art Journal* compared the collection of *cartes* to an *ad infinitum* multiplication of national portrait galleries because they were able to be collected in "an unlimited range and in every possible variety—family-friends, collections of the portraits of friends, and of celebrities of every rank and order, both foreign and of our own country." Cartes constituted and expressed a collective identity, integrating public figures into the intimate arena of individual subjectivity.

The format of the *carte* was important in conditioning its appeal and ensuring its assimilation into everyday life. Small, ephemeral commodities which were widely available, easy to hold, easy to pass around, easy to look over by the dozen within a drawing-room, *cartes* possessed little distinction in themselves. They were

literally "touchy-feely" artefacts; not to be looked at with deferential awe or revered from a distance but catalogued and collected, gossiped and commented upon. The carte-de-visite had a distinctly egalitarian aesthetic. As the *Reader* put it in its edition of 9 August 1862, "Here there is no barrier of rank, no chancel end; the poorest carries his three inches of cardboard, and the richest can claim no more."

One of the most notable features of *carte* portraits is their uniformity of representation. Most contain a full-length single figure, posed inside a studio using a number of stock props and gestures. This uniformity stems from the fact that the artistic conventions initially used for picturing aristocratic sitters were imitated endlessly. Studios serving high society sitters were often sumptuously decorated, using genuine *objet d'art* for their props. Alongside such ornateness, however, a whole industry grew up in order to provide the majority of studios with cheap wooden balustrades and papier-mache adornments.

The expansion in the number of photographic studios resulted in numerous articles satirising the social performance of carte portraits. For some critics, there was a disjunction between the working-class class status of those sitting for their carte and the fine art conventions that were being used to represent them. The most notorious of these was the stereotyped false background:

> There is Mrs Jones, for instance, who does the honours of her little semi-detached villa so well: how does she come to stand in that park-like pleasure-ground, when we know that her belongings and surroundings don't warrant more than a little back-garden big enough to grow a few crocuses? Or Miss Brown again, why should she shiver in a ball dress on a veranda, and why should we be called upon—instead of looking at her good honest face—to have our attention called away to the lake-like prospect at her back? (Andrew Wynter, "Photographic Portraiture," *Once a Week* 6 (1862) 148)

The carte studio was as much a space for fantasy as it was for unadorned realism. *Cartes* were a pleasurable opportunity for posing and theatricality. Signs of labour and occupation were often discarded in favour of refined bourgeois poses. For many sitters, the pleasure of the *carte* was not in its realism but in its ability to enact a magic-grotto like transformation.

Cartes were produced in immense volumes during the last four decades of the century. However, they were fashionable only until the mid 1860s, when they were superseded by the introduction of the larger cabinet portrait. After reputedly being the richest photographer in the world, making £48,000 in 1861, Disderi himself was declared bankrupt in 1872.

JOHN PLUNKETT

See Also: Brewster, Sir David; Diamond, Hugh Welch; Disdéri, André Adolphe Eugéne; Wet Collodion negative; and Wet Collodion Positive Processes.

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CASED OBJECTS

The cased portrait predates photography, and the adoption of the leather case for the presentation of early daguerreotype portraits may be seen as the infant photographic art seeking to present itself in a format traditionally associated with the miniature painting. Photography therefore exploited a case-making industry which was already established, albeit on a small scale, and adopted the sizes, formats and styles of the cased miniature portrait painting.

The cased photographic portrait enjoyed widespread popularity in the United States and Great Britain, with limited popularity in South America and mainland Europe, particularly France. The frame—the alternative to presentation in a case—enjoyed widespread popularity in Europe despite the difficulties associated with viewing a framed daguerreotype. The case enhanced the perceived value of the photographic portrait by emulating a miniature painting, and by preserving the intimacy of the portrait it contained.

The evolution of the case from being a bespoke item produced for a very small and exclusive market—the painted portrait miniature—to a mass-market commodity brought with it standardization, mass production, and the development of entirely new materials. Standardization of camera formats introduced the fractions of full plate sizes that became universal—from whole plate down to 1/16th plate—and case manufacturers followed suit. In addition to the traditional morocco leather coverings, fabric covered cases—especially velvets—achieved some popularity. As alternatives to covered wood-framed cases, papier maché, mother-of-pearl, pressed metal and thermoplastic were all widely used in case manufacture. In Japan and China, plain uncovered wooden cases were available. Portraits presented in

lockets, brooches, watch cases and other enclosures—often also containing a lock of the subject's hair—were also highly popular in America and Europe.

While the leather-covered cases used to house miniature paintings were traditionally plain, the growing market for photographic cases brought about additional case decoration. By the mid-1840s, embossed leather cases had been introduced in the United States—by John Plumbe Junior and others. The 1850s saw more heavily embossed case designs, often using lower grade hides, as market pressures drove down unit prices. Later, embossed paper-covered cases achieved widespread popularity at the lower end of the market.

While it is only to be expected in the later era of mass-production that many of the cheaper cases bore no maker identification, it is more surprising that the majority of early casemakers are also unknown. Some makers and engravers can be identified. In America the names of Matthew Brady, Benjamin True, Harold Eichmeyer, David Pretlove, John Smith, and others can all be found on labels or embossed discretely in corners of cases, and in Britain cases made by Thomas Wharton of Birmingham have also been identified. From contemporary advertisements several more makers are known, of whom Edward Anthony of New York wasprobably the largest. As most did not identify themselves on their cases, the scale of their operations cannot be estimated.

The brass mats which surrounded the image occasionally bear their makers' names, and were sometimes patented. Elisha Mander of Birmingham, England stamped his name even on low quality foil mats. The surrounding brass frame which held image, mat and cover glass together bear no maker identification.

Thomas Wharton's English design for a mat and preserver pan dates from the early 1840s enabled a small portrait image to be presented in a larger case. It was an early example of manufacturers using recently introduced design registration to protect their ideas. The back of Wharton's embossed metal preserver pan bears the British Royal Coat of Arms, registration No.791 and a date of August 24th, 1841.

Case manufacturers offered an embossing service which stamped the photographer's name and address in gold on to the outside of the case. Others impressed the information into the velvet cushion pad on the left side of the opened case, or stamped it on the bottom of the brass mat. Relatively few photographers availed themselves of this facility, and the majority of leather, paper and papier maché cased images remain as anonymous as the makers of the cases which contain them.

The portrait case represents the first and most significant attempt to market the photograph as a precious object by adding to its perceived value, and in so doing the nineteenth century casemakers were quick to recognize the potential of new materials. Foremost amongst these was the use of thermoplastic to mould elaborate decorative cases. Pioneered by onetime photographer Samuel Peck in the early 1850s, the thermoplastic case industry grew rapidly.

Unknown Maker, American. Herdsman with Cox.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

The world's first significant use of plastics, the union case married the Victorian industrial ingenuity to the presentation of the photographic portrait. Over one thousand different designs of thermoplastic case have been identified, and are as worthy of the historian's interest as the images they contain.

Union cases were predominantly American in origin, the majority of makers located in and around Connecticut. Major makers were Samuel Peck and Company, A P Critchlow, Holmes Booth and Hayden, and Wadhams Manufacturing Company. Amalgamations brought about larger groupings such as Littlefield Parsons and Company and the Scovill Manufacturing Company, the latter also being involved in the production of daguerreotype plates.

In Britain, thermoplastic button-maker John Smith produced a small range of cases, expanded by his successors James and Edwin Gyde. Available from whole plate down to 1/16th plate, the majority of union cases were produced in the popular 1/9th and 1/6th plate sizes. Most bear a maker's label, and several have the die-engraver identified within the design.

Union cases designs include geometric motifs, floral motifs, scenes from American history, from the Bible and legend, and reliefs based on popular art and sculpture. Die engravers included Frederick Seiler, Frederick Key, Smith and Hartmann, Hiram Hayden, but many examples of the engraver's art are not identified. In Britain, John Smith's cases were made from dies engraved by Brookes and Adams of Birmingham.

A small number of cases were produced for the paper carte-de-visite print, but the low cost of the image did not warrant the high cost of the case. By the mid-1860s, the cased portrait was in decline and the family album was in ascendancy.

JOHN HANNAVY

See Also: Daguerreotype; Brady, Matthew; Cartes-de-Visite; and Mounting, Matting, Passe-Partout, Framing, Presentation.

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CASLER, HERMAN (1867–1939)

Motion picture inventor, engineer

Born at Sandwich, Illinois, March 12, 1867. Married Fanny Ehle. 1893 patented the Photoret novelty camera. With Elias Koopman, Harry Marvin, and W. K.-L. Dickson, Casler founded the KMCD syndicate (an informal group), and later in 1895 the American Mutoscope and Biograph Company. Seeking to design a competitor to Edison's peepshow Kinetoscope, they developed the Mutoscope, the flip-photo coin-operated machine that would be a popular feature of amusement arcades for decades. Casler filed the Mutoscope patent November 21, 1894. A camera, the Mutograph, was also developed, and—as the peep-show business was unlikely to be sufficiently profitable—a film projector too; the Biograph. Casler was involved in the design and development of all of these machines. He was also patentee of a version of the kinora domestic flip-photo motion picture viewer, on which he had a patent agreement with the Lumières. In 1896 he formed, with Harry Marvin, the Marvin and Casler Company of Canastota for the production of motion picture, arcade, and drilling machines. He continued in engineering until 1926. Died Canastota, New York, July 20, 1939.

STEPHEN HERBERT

CELEBRITY AND ROYALTY

One of the most notable consequences of the commercialisation of photography during the late 1850s was the advent of the celebrity picture. In both Europe and North America, the *carte-de-visite* heralded an unprecedented dynamic between mass culture and photography. Favourite politicians and actresses, kings and queens, and, later, well-known sportsman; it was the advent of the *carte-de-visite* that made celebrity photographs available in large numbers. They created a popular broadening of the public sphere and exacerbated the expectation that well-known figures would have a publicised existence.

Celebrity photographs had both an individual and collective agency. They were notable for their collective agency because, through their widespread circulation, they went beyond the scope of other graphic media like wood-engraving and lithography. Their ubiquity helped to provide a collective experience of any one individual. Thus, for example, photography was instrumental in creating the familiar and iconic image of Queen Victoria in her widow's weeds. Significantly though, celebrity photographs were also notable for the intimate relationship they generated between individual consumers and well-known figures. The collection of celebrity photographs helped to reinforce an individual's sense of themselves as belonging to an imagined national community. Compared to existing graphic media, the lens of the camera proffered a more authentic and affective relationship with the distinguished sitters so depicted.

In Britain, the first attempts to publish photographs of famous figures took place in the second half of the 1850s. One notable venture was that by Maull and Polyblank, who published a series of *Photographic Portraits of Living Celebrities*. The first issue appeared in May 1856, and the series was subsequently published in monthly instalments up to October 1859. Each issue included a mounted albumen print, 19.5 cm × 14.5 cm, accompanied by a biographical notice. Maull and Polyblank's publication set the format for

many European publications. Other series include Ernest Edward's *Portraits of Men of Eminence in Literature, Science, and Art* (1863–67), Disdéri's *Gallerie Des Contemporains*, and the *Album der Zeitgenossen (Album of Contemporary Figures)*, which was started in 1860 by two Munich photographers, Alois Löcherer and Franz Hanfstaengl.

A second significant type of early celebrity pictures was the reproduction of portrait photographs as engravings. From the early 1850s, journals like the *Illustrated London News* regularly used daguerreotypes as the basis for portrait engravings. When the *Illustrated News of the World* commenced publication in January 1858, alongside its graphic news it printed the *Drawing Room Gallery of Eminent Personages*. These were portrait engravings by D.J. Pound after photographs by John Jabez Edwin Mayall, accompanied by short biographical sketches. Included in the series were Queen Victoria and Prince Albert, Lord Stanley and Charles Dickens. Celebrity images were thus photographic well before they were constituted wholly through photographs.

Celebrity portraiture in America followed a similar path in that the 1850s saw attempts to create national galleries and to utilize engravings of photographs. Matthew Brady was the key figure in these early efforts to promote the images of distinguished national personages. In 1844, Brady opened his Daguerrian Miniature Gallery at 205–207 Broadway, Fulton Street, with another studio opening in Washington in 1849. Despite the non-reproducibility of the daguerreotype, in 1850 Brady published his *Gallery of Illustrious Americans*, a series of twelve lithographs of famous Americans made after daguerreotypes. Subjects included Zachary Taylor and John James Audobon. Brady's portraits won a Gold Medal at the Great Exhibition of 1851, and he continued to take photographs of distinguished personages. In 1857 *Harper's Weekly* published its first engraving of a portrait taken by Brady. In 1860 Brady famously photographed the Republican presidential candidate Abraham Lincoln, a picture that *Harper's Weekly* subsequently translated into a full-page front-cover woodengraving. In the same year, Brady also photographed Edward, Prince of Wales, on his highly successful tour of Canada and the United States. With the advent of the fashion for *carte-de-visites* in the early 1860s, E. & H.T. Anthony began to distribute large numbers of Brady's photographs.

One reason that the *carte-de-visite* marked the meteoric rise of the celebrity photograph is that it was reputedly only when photography became sufficiently flattering that distinguished personages were prepared to let their pictures enter public circulation. In 1861, the *Saturday Review* claimed that, prior to the *carte,* photography had distorted and exaggerated the prominent features of the face to the extent that celebrities had not been prepared to let themselves be revealed in such unflattering guises. As an article in the *Quarterly Review* put it in 1864, "it gives you a kind of panoramic view of your friend, and gives a prominence to his best coat and trousers, which cast his features into the shade"("Photography," *Quarterly Review* 116 (1864, 516).

A key figure in the popularisation of celebrity photographs in Europe is the Parisian photographer André Adolphe Eugéne Disdéri. By 1857, Disdéri had begun amassing portraits of the French royal family and its entourage. His photographs of Napoleon III and Empress Eugenie helped to start the fashion for celebrity *carte-de-visite*, which became cultural phenomena across Europe and North America. Between 1860 and 1862, Disdéri published two one franc instalments each week of a *carte-de-visite* portrait accompanied by four page biographical sketch.

Photographs of the various European monarchs and their families were amongst most successful celebrity pictures. Disdéri's published portraits of Napoleon III and Empress Eugenie may well have provided a reassuring model for the publication of photographs of the British royal family as, in August 1860, Mayall was permitted to publish his *Royal Album*. It was not until Manchester Art Treasures exhibition in 1857 that photographs of the British royal family had been officially shown in public for the first time. And, while royal photographs had been shown at subsequent exhibitions of the Photographic Society, these pictures had a singular existence and were neither for sale nor reproduction. Mayall's *Royal Album* was a wholly different kind of venture and was a phenomenal commercial success. Between 1860 and 1862, 3–4m copies of Queen Victoria's *cartes* were claimed to have been sold. Photographs of monarchs such as Napoleon III and Queen Victoria helped to promote the image of a patriotic and bourgeois royal family. A photograph of the young French Prince Imperial, for example, shows him dressed in a military outfit, wearing a hugely oversized busby and carrying a drum. These is a similarly loyal *carte* from 1860 of the future Kaiser Wilhelm II; a photograph by L. Haase, entitled "Little Willy's First Salute," shows the infant Prince saluting the camera.

With the pleasure of seeing photographs of well-known personages for the first time, collecting celebrity *cartes* became the latest European fashion. In October 1861, the British *Art Journal* compared the collection of diverse *cartes* to an *ad infinitum* multiplication of national portrait galleries. Celebrity photographs integrated well-known figures into the intimate arena of individual subjectivity. The *Art Journal* specifically drew attention to the importance of the *cartes* of the British royal family through their creation of a shared pattern of experience:

> The production and the reproduction and the diffusion of the *carte-de-visite* portraits of Her Majesty the Queen, and of the various members of the Royal Family, would furnish materials for no ordinary chapter in the history of popular Art. . .Without a doubt they will be required in tens of thousands. They will have to find a way into every quarter of our sovereign's wide dominions, and into every city and town, both at home and in the colonies. . .These royal *cartes-de-visite* leave far behind all other agencies for enshrining our Sovereign's person and her family in the homes of her people. They do for everybody, as much as Winterhalter can do for the Prince Consort himself.
>
> "Cartes-de-visite," *Art Journal* (1861) 306.

By equating the possession of a royal *carte* with Franz Winterhalter's court portraits, the *Art Journal* is eulogising the intimacy of the personal insight that photography offered.

From the early 1860s, the celebrity *carte-de-visite* was an industry with its own London wholesale house, Marion & Co., which stocked thousands of celebrity photographs of every kind. In 1862, their manager claimed that 50,000 *cartes* passed through the firm's hands every month. Forgeries of the celebrity photographs became commonplace and large profits were made out of an immense number of quasi-illegal pictures. Prosecutions took place regularly in the years following the introduction of a revised Copyright Bill in July 1862. Reported cases in the 1860s involved photographs of the Princes of Wales and the Duke of Cambridge. In France, there was a similarly thriving trade in illegal celebrity photographs. Mayer et Pierson, one of most successful Parisian studio of the 1850s, sued Ledot and six other photographers in 1862 for marketing counterfeit *cartes* of the emperor, empress and other notables.

Copyright records of British photographs, which were registered at Stationer's Hall, are a quantitative index to the celebrity photographs in circulation after 1862. Although they cannot reveal the volumes sold of any one photograph, they do record the number of portrait photographs registered of any one sitter. The copyright records emphasise that, especially during the 1860s and 1870s, the supply of celebrity *cartes* was dominated by those of royalty, politicians, artists and the leading clergy. Out of the first 2000 photographs that were registered, between 29 July 1862 and 11 September 1863, 317 contained one or more members of the British royal family, a proportion of just over 15%. Between 1862 and 1900, the two sitters who had by far the largest number of photographs registered for copyright were the Prince and Princess of Wales. Only theatrical figures like Lillie Langtry and Ellen Terry come close to the total number of royal photographs registered.

The prominence of pictures of the various European royal families emphasises the way that the first celebrity photographs were keyed into the existing social

Unknown. Frederick Douglass.
The Metropolitan Museum of Art, The Rubel Collection, Partial and Promised Gift of William Rubel, 2001 (2001.756) Image © The Metropolitan Museum of Art.

hierarchies. Conversely though, the celebrity *carte* was perceived to be democratic artefact, characterised by an aesthetic of demythologising equality. Partly, this was due to the changing status of photography: a counterpoint to the concern that photography had been debased into a vulgar medium was the claim that it had been democratised into a universal one. Moreover, whereas it was the traditional role of the portrait painter to search after the ideal—and in so doing judiciously flatter the well-heeled sitter—the lens of the camera was lauded for truthfully seeing alike all who sat before it. In an article in *Once a Week* on the superseding of the miniature portrait by the photograph, one commentator sardonically commented that, "Tompkins of Hopkins may submit to go down to posterity as livid, corpse-like personages; but the Lady Blanche or the fair Geraldine forbid it, Oh heavens!" In imposing the unadorned realism of its technological format upon its sitters, the camera had a demythologising effect upon its celebrity sitters.

The equalising nature of the celebrity photograph also stemmed from its status as a circulating commodity. In a second article in *Once a Week*, Andrew Wynter compared the National Portrait Gallery, with its reclusive opening hours of only three days a week, to the accessibility of the street-portrait galleries of any photographic establishment:

> Certainly our street portrait galleries are a great success: no solemn flight of stairs tends to pompous rooms in which pompous attendants preside with a severe air over pompous portraits; no committee of selection decide on the propriety of hanging certain portraits. Here, on the contrary, social equality is carried to its utmost limit, and Tom Sayers is to be found cheek-by-jowl with Lord Derby, or Mrs Fry is hung as a pendant to Agnes Willoughby. The only principle governing the selection of the *carte-de-visite* portraits is their commercial value, and that depends upon the notability of the person represented.
>
> (Andrew Wynter, "Cartes de Visite," *Once a Week* 6 (1861–1862): 135)

For many reviewers, the democracy of the celebrity photographs was constituted by their unfettered exhibition and circulation. Celebrity *cartes* broadened, albeit slowly, the scope of the public sphere. Photographs of the Queen could be placed side-by-side with working-class icons. The celebrity photograph created a new marker of cultural visibility, one less connected to traditional notions of status and wealth. Thus, at the same time as Disdéri was busy photographing the imperial court, Nadar was taking celebrity portraits of the members of bohemian Paris, many of them friends and acquaintances, including Baudelaire, Gautier, Dore, Dumas, and Sarah Bernhardt.

In Britain, one of the earliest examples of a working-class figure being turned into a celebrity through the aid of his photographs is Tom Sayers. In April 1860, Sayers fought the American champion, John Heenan, in what was effectively a fight for the undisputed championship of the world. Before the fight, Sayers was beset with photographers claiming the honour of paying for his sitting. However, his reported answer was "It's no good, gentlemen, I've been and sold my mug to Mr Newbold" (Newbold was a publisher of one of the sporting papers). 50,000 *cartes* of Sayers were reportedly sold around the time of his fight. Newbold's treatment of Sayers is an early example of how photography was used to allow a working-class figure like Sayers to achieve a populist prominence.

The case of Tom Sayers is paralleled by the situation of General Tom Thumb in America. In the 1860s, in addition to their Civil War work, Brady and his studio photographers continued to take many distinguished figures. One celebrity subject was General Tom Thumb: numerous *carte-de-visites* were taken by Brady's studio to both commemorate and commercially exploit his lavish wedding in 1863. The diminutive Tom Thumb, born Charles Stratton in Connecticut, had been initially discovered and exhibited by P.T. Barnum. However by the early 1860s, Thumb had split with Barnum and organised his own tours and exhibitions, consequently also taking control of the lucrative trade in his *carte-de-visites*. Thumb's decision, like that of Sayers,' epitomizes the growing self-consciousness towards the value of celebrity portraiture.

If the celebrity *carte* was characterised by its proliferation into the drawing room through the photographic album, a corresponding effect of such insinuation was a heightened awareness of the intrusive properties of the camera. The camera was already disreputably associated with a more intrusive form of celebrity. A series of engagement *cartes* of the Prince of Wales and Princess Alexandra, taken in November 1862 by the Belgian photographers, the Ghemàr Frères, exemplify the tension aroused by the camera's double form of permeability. Frères's engagement *cartes* depict the affections of the affianced couple and several of the photographs show Edward or Alexandra standing with their arms resting lovingly on the shoulders of the other. These displays of intimacy were far removed from the formality of a state portrait and were found to be distasteful by some commentators. There was discomfort over having the life of the monarchy constituted to such an extent through the camera. As the *London Review* put it "whether it be joy or grief affecting the royal family, in some way the lens of the camera appears to spy into it in the most offensive manner . . .these sacred feelings are turned to commercial account" ("The Medley of Portrait Cards," *London Review* 20 June 1863: 658).

Although the rage for *carte-de-visite* lasted only until the mid 1860s, photography played an increasingly dominant role in the constitution of celebrity. The advent of photo-journalism helped to exacerbate the spectacle of large public occasions. Increasingly high prices were paid for the rights to photograph celebrities. In 1880, Napoleon Sarony, probably the second most notable American celebrity photographer after Brady, famously paid Sarah Bernhardt $1500 for permission to shoot her while on her tour of America. Sarony was renowned for his portraits of theatrical performers working on the New York stage, and in 1882 was involved in a landmark legal case involving the piracy of a photograph he had taken of Oscar Wilde. By the end of the nineteenth-century, the growth of the popular entertainment industry, in both Europe and America, meant that the celebrity photograph was well-established. The growing ability to reproduce photographs in periodicals and newspapers also meant that these pictures received greater circulation. In the 1890s, for example, the *Strand* had a regular article on "Photographs of Celebrities at Different Times of their Lives." By the time of Queen Victoria's Diamond Jubilee in 1897, the ability of photography to disseminate images of public figures was even officially recognised. An official photographic portrait, taken by W & D Downey, was sanctioned for the first time. The key point about the Diamond Jubilee photograph is that it was deliberately

not registered for copyright, a decision that allowed it to be reproduced on biscuit tins, commemorative plates, mugs and souvenir artefacts of every description. In the Diamond Jubilee photograph, the very lack of official control over the photograph was the way that the iconic figure of Victoria was constituted. In a defining moment for celebrity photography, the media image took over the role of the traditional court portrait.

JOHN PLUNKETT

See Also: Carte-de-Visite; Illustrated London News; Mayall, John Jabez Edwin; Victoria, Queen and Albert, Prince Consort; Disdéri, André Adolphe Eugéne; Marion & Son, A.; and Downey, William Ernest, Daniel, & William Edward.

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CENTRAL AMERICA AND THE CARIBBEAN (EXCLUDING MEXICO AND CUBA)

During the first two decades of photography, the daguerreotype and other procedures were employed by explorers and adventurers, most of them Americans and European, who had crossed nearly all political and geographical boundaries in their travels.

They were generally influenced by Alexander von Humboldt, the most relevant scientist devoted to the study of the New World, who encouraged the use of photography as a tool for naturalists and scientists.

Several explorers repeated Humboldt's travels, reaching the places visited by him and Bonpland some years ago, as did the Austrian citizen Emanuel von Friedenthal (1809–1842), who daguerreotyped along the Yucatán peninsula between 1839 and 1841. An exhibition of 25 images from this travel took place in London and Paris in 1841; all of them are today considered lost.

Also noteworthy is the North American archaeologist John Lloyd Stephens (1805–1852) and the English engineer Frederick Catherwood (1799–1854), who explored the maya cities in Guatemala and Honduras. In their second trip, between 1841 and 1842, they took daguerreian views of the extant ruins of the palaces of Copan, acheiving success with only few of their images.

Robert M. J. Douglass (1809–1887), an African American itinerant daguerreotypist, visited the main Antillian islands in 1847. Afterwards he made trips through several countries of Central America, and finally settled in the Bahamas in the 70's. Another daguerreotypist, but one of Canadian origin, Thomas Coffin Doane (1814–1896) travelled along the Antillian region between 1844 and 1846. The legendary brothers Ward -Charles and Jacob- from Bloomfield, New Jersey, US, frequented the Caribbean islands between 1841 and 1846, as well as did the Hungarian prince Pal Rosti, who in a private photographic tour visited the U.S., Mexico, Venezuela and Cuba, between 1856 and 1858.

An early photographic documentalist, Claude Joseph Desirée Charnay (1828–1909), who in 1857 visited several countries of Central America and Mexico, recorded in large size plates the ruins of Chichen Itzá and Güija lake (El Salvador), empoying both salt print and albumen techniques.

The French painter and photographer Ernest Charton arrived to Guatemala, Nicaragua and El Salvador from Panamá in 1852, on his way to California. The North American William Buchanan visited the same region, including Costa Rica, first in 1853 and then between 1857 and 1862, recording the ruins of Cartago monastery, the parochial church of Heredia, and the church of Orosí.

Charles DeForrest Fredricks, an American photographer (1823–1894) started his long career in 1846, in Angostura (Venezuela), continuing to Tobago, Saint Vincent, and then Trinidad. After this first voyage he returned sick and without money to the U.S. After recovering, he returned in the pursuit of a destiny of adventure and success.

In 1858 John H. Fitzgibbon another American photographyer (1816–1882) departed for a voyage along Central and South America. He visited El Salvador and Nicaragua, and in 1859 arrived to Guatemala, photographing the just opened Teatro Carrera.

Emil Herbruger, a German Photographer (1820–1890) settled in the U.S. in 1841 and received, in 1843, a prize for his daguerreotypes. He visited the Antilles, El Salvador, Nicaragua, Honduras (Tegucigalpa) and then remained in Guatemala.

A native from the Antilles, Paul-Emile Miot, joined the French Navy and in 1857 organized a photographic lab for the processing of plates taken in several naval expeditions, in Terranova, Senegal, Perú, Chile, Oceanía, Tahiti and the Marquis islands.

Eadweard Muybridge, a North American of multiple interests, travelled to Costa Rica, El Salvador, Guatemala, Nicaragua and Panamá. The result was an exhaustive photographic collection, particularly from Guatemala, where he remained longer.

By the sixties, photography was so popular that all social classes could recognize photographs as identificatory elements. At the same time, albums of views emerged, because of their exotic aspects or documentary value.

Additionally, railroad development often attracted numerous foreigners looking for work in the region, and often carried photographic equipment. Also, engineer workers were documented by their constructors, tus finding a new role for descriptive photography.

In the market of exotic places and images, in which Central America was included, it is worthwhile to mention stereographs. Anthony & Co. sent photographers to several places in the world, and specially to this region. In 1860 George N. Barnard (1819–1902) was comissioned to make a series of stereoscopic views of Cuba.

Later, thousands of stereographs from the region were made, mostly by photographers belonging to American companies. At the turn of the century, however, Brown & Dawson visited the same area, and made views of Martinica, Barbados, Puerto Rico and St. Thomas.

Bahamas

The English photographer Henri Louis Duperly (1840–1908) owned a studio in Nassau in the 70s, under the name "Duperly Brothers."

Bermudas

N.E. Luscher was an itinerant photographer active in the 90s and made views of the main streets in Hamilton. Several publishing houses produced stereoviews of the island, for instance Balch, J.B. Heyl, H.L. Chase, T. Frith and the Kilburn Brothers.

Costa Rica

Santiago Páramo (1841–1915), was an arquitect, painter, sculptor and amateur photographer, and left behind many graphic records of San José and Puerto Limón. Masters of the stereoscopy like F. Albar, L. Fortino and A.S. Taylor produced views by the 70's, which are now extremely scarce. H.N. Rudd and the studio Paynter Bros. were active by the turn of the century and left views of Alajuela and San José as well, and recorded the activities of the United Fruit Co. and the banana and coffee crops.

Curaçao

The daguerreotype period was represented by Frederico Guttich and Senior Hartman, this last one being based in Martinique.

Several travelers were active in this Dutch colony, like Epifanio Bellini (1823–1892) from the Dominican Republic; and the Bostoniano: Thomas Gray, M. Hofman, L.A. Leavitt, Gabriel Salom Landaeta; and the partners Velez & Serralle, who later too moved to Cuba.

Alva Pearsall (1837–1898) visited not only Curaçao but also Jamaica, Guyana and Surinam, as well as John L. Ricker from New York.

El Salvador

Emil Herbruger was based in Guatemala and made periodical trips to the capital city of El Salvador. Between 1870 and 1900, Henri Louis Duperly from England (1840–1908), the French citizen Félix Morin, and the African American photographer Robert M. J. Douglass (1809–1887) were active.

Guatemala

Like in all the entire region, daguerreian pioneers were foreigners. In 1843 the arrival of the French León de Pontelle from México city was recorded. He established a studio in Calle del Colegio. After him, in 1846, Emilio Herbruger arrived, but he soon left the country. Nicolás Fuchs settled around 1847, and then went left, finally returning from 1853 to 1858, to take ambrotypes, melanotypes and photographs.

In 1861 and 1862, the botanist Osbert Salvin recorded indigenous indian groups.

In 1866 Emilio Herbruger returned, as the owner of Hawley & Buchanan studio. Photographer and piano teacher, in 1868 he dedicated his polka *La Unión* to the guatemaltec ladies. The musical score's front page includes a mounted photomosaic of 68 photographic portraits of his pupils. By 1871 he established his studio "*Fotografía Imperial*" in Guatemala.

After Emilio Herbruger passed away (1890), his son Emilio Herbruger junior took charge of the studio, until the beginnings of the 20th century.

During the 60s, the photographers G.A. Hawley and Enrique Seeligman, were active, making stereoscopics as well.

Between 1882 and 1888, travelers such as Sanfred Robinson made photographic registers of remote places, industries, crops, and indian huts.

In 1882 Juan José de Jesús Yas (Japan 1844–1917) opened his studio "Fotografía Japonesa," and then visited Mexico and Peru, returning to Guatemala in 1890. This photographer acted as an interpreter of the Mexican Commision that travelled in 1874, to Japan, in order to observe and take photographs of the transit of Venus in front of the Sun. This visit preceeded a second visit to Mexico, probably during the next transit of Venus, in 1882 and afterwards, he settled in Guatemala.

In 1880 the photographer Emilio Eichenberger was active in 129th Oriente Street. Legrand & Co. was another renown studio at the end of the century.

Haití

The photographer Joseph Henri Besse (Haití 1810–1871), who was sent young to study in Paris, returned mastering the art of photography.

Edmond Laforestiére (1837–1894) also traveled from Haití to Paris, where he became a photographer. Once back to his country, he became an active professional. Barón Colbert de Lochard, from St. Marc, made photographic portraits in the 50s, and J. Wheeler actively produced stereoviews during the 60s, as well as W. Watson in the 70s.

Honduras

Typical itinerant photographers, were Alva Pearsall, active in 1865, J.W. Newland and the German citizen Federico Lessman. All of these photographers were headquartered in Venezuela. In 1883, Alfred P. Maudslay left traces of his work documenting the ruins of Copán.

By the turn of the century, Juan T. Aguirre worked in Tegucigalpa taking views for commercial purposes, and later devoted himself to photomechanical reproductions.

Jamaica

Installed in Kensington near 1878, Ernesto Bavastro made portraits of important Cuban patriots, like the hero Máximo Gómez and some other well known people like Rafael Rodríguez, Enrique Collazo, and Enrique Canals, who moved to Jamaica after the Ten Years War. Bavastro's studio was located in 67 King Street, Kingston. Great quantities of stereoviews were made by several studios, like A. Duperly & Sons, George W. Davis y P. Sarthou, particularly between 1860 and 1870.

Martinique

François Gouraud (1812–1848), from Martinique, studied with Jacques Mandé Daguerre and became a representative of Alphonse Giroux in the island. Senior Hartman was active also in the early daguerrian years, and travelled along the Antilles.

Panamá

Thimothy O´Sullivan, the American photographer (?–1882), participated in the expedition to Darién in 1870, and intended to study a proper location for digging a channel through the istm. He was hired out as an official photographer of the expedition on January 11, 1870, and returned five months after. O´Sullivan did not take enough photographs of the area, due to the adverse climate and the cumbersome operation in the jungle, but nevertheless succeded in documenting the expedition and getting anthropological records of the indians and their huts, as well as in taking views of San Lorenzo y Cartagena. He gathered more than 200 stereos and over 100 glass negatives about the region. In 1871, John Moran followed his steps, getting a larger quantity of stereoviews. When the French engineer Ferdinand de Lesseps was appointed as director of the channel works, professional photographers were sent to document the whole operation, including the landscapes and natives.

Puerto Rico

The French photographer H. Gautier was active in San Juan in the 1870s. He was devoted intensively to the *carte-de-visite* format. His publicity consisted of a curious round label with nice engravings. By the 1890s, in the location of Ponce, worked a photographer named M.C. Gray.

By the end of the 19th century, the vernacular photographer Eduardo López Cepero documented the city of San Juan and its fortresses. The most outstanding photographer during that period however was Feliciano Alonso (?–1901). In 1882 he received a prize in an exhibition that took place in Ponce and in 1893 he was in charge of recording the buildings and activities of the Great Exhibition at San Juan de Puerto Rico. He made two albums of views, which were the *Álbum de Puerto Rico* and *Álbum de vistas fotográficas de Puerto Rico*. He started producing stereoviews when the American occupation occured in 1898.

República Dominicana

The painter Epifanio Billini (1823–1892) was considered the first photographer in the island. Although another outstanding photographer was David Benjamín Benzo (1840–1896), who moved later to Caracas (Venezuela). At the end of the 19th century Abelardo Rodríguez Urdaneta (1870–1933) was active as well.

Trinidad

The French photographer Félix Morin worked in Port Spain during the 1870s.

The "Eureka Art Studio," of J.E. Marshall, at 20 Frederick Street, was active near the end of the 19th century, making portraits and recording popular types and public markets. Later, at the beginning of the 20th century he merged with the new enterprise "Muir, Marshall & Co." This studio produced albums with photomechanical reproductions that were intended as souvenirs from the island.

Conclusions

It is evident that most of the early activity in the region was made by travellers or foreign photographers. Many of them settled down in the different cities, building stronger traditions in each place.

The discovery of exotic places via adventurers was a *primum mobile,* that slowly was replaced by a second wave of photographers who pursued the search for a place that World foster a successful comercial business.

Portraits, as usual, were the main production of these artists, mainly in carte-de-visite and portrait-cabinet formats. Likewise, extant views were mostly in stereoscopic format.

Abel Alexander and Roberto A. Ferrari

See Also: Muybridge, Eadweard James (Edward Muggeridge); Kilburn, Benjamin West and Edgard; and Daguerre, Louis-Jacques-Mandé.

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CEYLON (SRI LANKA)

Evidence of photographic activity in Sri Lanka during the first decade of photography is sparse, and it is now unlikely that we will learn when the first photographs were taken on the island. It is known, however, that one S. J. (or possibly S. F.) Barrow, whom the commercial directories place in the island from 1844–49, was active as a daguerreotypist for a period in the mid-1840s. While no examples of his work are known to have survived (perhaps unsurprising in view of the context in which his name appears), an 1850 advertisement placed by John Vanderstraaten in the periodical *Young Ceylon*, claimed to be able to restore the now 'defaced and obscure' daguerreotypes that Barrow had taken (at a cost of between £4 and £10 each) in studios in Colombo and Kandy in around 1844. The high cost of these portraits and their evidently inferior quality, may go some way to explaining the lack of enthusiasm for photography which seems to have characterised these years.

The earliest extant photographs from Sri Lanka are now almost certainly those taken by Frederick Fiebig, a German lithographer turned calotypist based in Calcutta from the mid-1840s. Fiebig appears to have visited the island during a trip to South India in 1852 and some 70 hand-coloured salted paper prints of the island were purchased by the East India Company in 1856. These indicate that he photographed only in Galle (then the island's principal port), Colombo and Kandy, taking architectural views, landscapes, coffee estate studies and portraits of representative 'native types,' a choice of material which was to become a staple for succeeding generations of commercial photographers on the island.

Apart from this body of work—produced by a temporary visitor rather than a resident photographer—the 1850s appears almost as barren of photographic activity as the previous decade. Only one commercial photographer, James Parting, appears to have remained in business for any substantial period. Parting traded as a watchmaker, but from 1855–59 he operated a daguerreotype and latterly a wet collodion photographic studio. Although a few crude wood engravings copied from his work were published, none of his original photographs has been identified. But Parting retains some importance as a direct link with the founding of the most successful 19th-century studio in the island, for before leaving Ceylon in June 1860, his business and equipment was purchased by the Government Printer William Skeen, who placed it under the management of his son William Louis Henry Skeen (1847–?1903).

The developments in photographic technology and a growing market of European residents made the early 1860s a propitious period for commercial studios and for the next forty years Skeen and Co exercised a largely unchallenged supremacy in the island. The studio (which until 1868 traded as Slinn and Co., presumably in reference to another family member, S. Slinn Skeen) established itself quickly and by the late 1860s its catalogue listed over 400 stock images, providing a comprehensive coverage of the architecture and scenery of the island's main economic centres of Colombo, Nuwera Eliya, Rambodda and Kandy. A major speciality of the firm was the very detailed documentation of the island's plantation industries, particularly tea, cocoa, cinnamon and other spices. The fact that little attention was paid to the north of island reflects the way in which the photographic market was rigidly determined by the location of the main centres of European population and economic activity. With the growth of the tea and other industries and a swiftly developing rail network (the latter also extensively documented by the firm), this deficit too was corrected in the last decades of the century. Views were also collected from as far afield as northern India, and in 1887 Frederick Albert Edward Skeen, who had worked for his brother since 1878, opened the Burma branch of Watts and Skeen in Rangoon. The firm survived (in a somewhat attenuated condition in the latter years) until the early 1920s.

While the late1860s and 1870s saw a steady if unremarkable increase in commercial studios, only Joseph Lawton, who opened his Kandy studio in 1866, offered any substantial competition to Skeen and Co. Contemporary reviews (such as an account of photographs of the newly-opened Colombo-Kandy railway in 1868) repeatedly compared their work, often in Lawton's favour, and it was Lawton who was selected by the island's Archaeological Committee to document the ruined medieval cities of Anuradhapura, Polonnaruwa and Sigiriya. This work, undertaken in 1870–71, was Lawton's most important achievement and constitutes a remarkably powerful record—both from a documentary and aesthetic viewpoint—of these sites at the very beginning of their modern archaeological history. Sadly, it was also to be his memorial, since he died in 1872 as a result of overwork and illness contracted while working in the jungle. His studio continued to trade under the management of his widow, but closed its doors within a few years.

Unlike India, which from the earliest years of photography had supported an enthusiastic amateur community, the professional studios appear to have supplied almost all the island's photographic requirements. While there is scattered evidence of amateur activity—the civil servant James Birch and the Royal Engineer Richard Warren, for instance, had preceded Lawton in photographing at Polonnaruwa in the late 1860s—no photographic society was formed which might have channelled and developed such work, and notwithstanding the residence of Julia Margaret Cameron (from 1875 until her death in 1879), few non-professional Europeans appear to have been inspired to take up the camera.

With the opening of the Suez Canal in 1869, the island became an increasingly attainable and popular tourist destination and the number of photographic studios increased in response to the demand for visual souvenirs. Among the most distinguished of these was the studio of Charles T. Scowen, who opened his first studio in Kandy in around 1875, with a Colombo studio by 1883. While Scowen's choice of subjects was generally comparable to that of Skeen and Co, early work from his studio is characterised by the particularly fine quality of his printing: this is particularly evident in the very beautiful flower and plant studies which appear to have been a speciality of the firm (appropriately, given the proximity of the great botanical garden at Peradeniya to his Kandy studio). Scowen's stock appears to have been acquired by the Colombo Apothecaries Company in the early 1890s, and continued to be marketed by them, but by the last decade of the century the majority of commercial firms were producing standard tourist views and postcards of little freshness or originality. While a number of these studios—such as A. W. A. Plâté & Co, founded in Colombo in 1890 and surviving up to the present—remained successful commercial enterprises, the photographic vision of the small group of early photographers who had documented the island's landscapes, archaeological heritage and economic development had by the turn of the century become largely exhausted.

JOHN FALCONER

See Also: Skeen, William Louis Henry; and Royal Engineers.

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CHARCOT, JEAN-MARTIN (1825–1893)
French physician and patron

Jean-Martin Charcot was born in Paris on November 29, 1825 and grew up in a middle-class home as the son of an artisan. He completed his secondary schooling at the Lycée Bonaparte and began his medical training in 1844, completing his doctorate at the Faculty of Medicine in Paris in 1853. His primary interest was in disorders of the brain and spinal cord. He became senior physician at the Salpêtrière Hospital for women in 1862, where he began to employ medical photography as a visual aid and diagnostic tool. In 1882 he became the first Chair of Diseases of the Nervous System at the Paris School of Medicine. During the final period of his career, Charcot became interested in hysterias and used photography to further his research. Charcot did not take photographs himself, but employed professional photographers to run the Salpêtrière's photographic studio. The photographs taken at the hospital under Charcot's direction were published in three volumes under the title *Iconographie photographique de la Salpêtrière* in the years 1877, 1878 and 1879. Charcot married Madame Augustine Victoire Durvis in 1864, with whom he had two children. He died in Paris on August 15, 1893.

Andrea Korda

CHARNAY, CLAUDE-JOSEPH-DÉSIRÉ (1828–1915)
French itinerant photographer

Claude-Joseph-Désiré Charnay was born near Lyon, France, in 1828 and died in Paris in 1915. After completing his education in Paris and travelling in Europe he moved to the United States, where he started teaching in 1850, in New Orleans, though yearning to become an explorer. Fascinated by John Lloyd Stephens's accounts of travels in Central America, he embarked on his own expedition in 1857, with a commission of the French government, to visit and photograph ruins in the Yucatán. This Mexican trip, which lasted until 1861, was the first of a long series of travels that took him to Madagascar (1863), Chile and Argentina (1875), Java and Australia (1878–79), and back to Mexico in 1880–82 and 1886. On all of these various expeditions he took photographs, most of them large-size glass negatives. Although on his first Mexican trip he concentrated on pre-Columbian architecture, the subject of his superb and widely acclaimed book *Cités et ruines américaine*s (1863), in later travels Charnay turned to a rather cold and even voyeuristic anthropological photography of native populations (especially in Java and Australia, and then in Mexico in the 1880s). His many illustrated books and publications, translated into English and Spanish, made him, in his lifetime, one of the day's famous explorers.

François Brunet

CHAUFFOURIER, GUSTAVO EUGENIO (1845–1919)
French photographer

Before 1869, Chauffourier, born Paris, turned up in Palermo taking photographs along with Perron as *Photographie Parisienne* and published an album of views, monuments and works of art with a text in French and Italian. In 1870 he obtained a permit to photograph from the collections of Naples Museum. In 1871 moved to Rome (although there is still reference to a studio in Palermo). He then became, along with his wife, Filomena Foschi, a travelling photographer and visited Austria, Serbia, Romania, Bulgaria, Turkey, Russia while changing his business address in Rome several times. After his death in 1919, his sons, Pietro and Emilio, continued to expand the business by the Spanish Steps, becoming 'Pietro—Emilio Chauffourier, photographer editors.' He is noted for documenting (including taking official buildings) the last years of the decline of Papal Rome before the Unification of Italy 1870. In 1953, 300 glass plate negatives of Rome and some positives were acquired by the Museo di Roma, 5,000 others passed to Alinari in Florence in 1960 but in the flood of 1969 were partly destroyed. Only a few images of his Italian views have ever been published. Yet his work can often be identified by strong characteristics: his love of an empty foreground, a nondescript street, an apparently lesser viewpoint in the cityscape, a personal angle of view, all of which contemporary trade photographers (and no doubt his sons or others the business might have used) would not have seen. All the more remarkable then that he still awaits the study he deserves.

Alistair Crawford

CHEVALIER, VINCENT (1770–1841) & CHARLES LOUIS (1804–1859)
Companies

Jacques Louis-Vincent Chevalier and his son Charles Louis Chevalier were Parisian opticians descended

from a family of opticians established along the quai de l'Horloge, île de la Cité. After ten years spent in the Napoleonic army, Vincent returned to Paris in 1803 to find his father had died, taking the family business with him. As a result, Vincent worked for other opticians before opening his own shop at 21 *bis*, quai de l'Horloge in 1805. His business a success, in 1810 he moved to a larger location at 67, quai de l'Horloge. In 1818, he expanded his shop into the neighboring 69, quai de l'Horloge. His son Charles also began working for him at this time.

Since glass was not made in his father's shop, from 1819–1821 Charles enrolled as an apprentice to an optician named Godelar. Charles's health started to decline and he began to suffer from bouts of depression, characterized by a series of persecution crises that were to plague him throughout his life. The first concerned Vincent's 1819 invention of a camera obscura with a meniscus prism lens, whereupon the reflecting surface normally located in the camera was reincorporated as part of the lens. Charles believed that the idea was his, and became angry that his father received exclusive credit for its invention.

From 1822–1824, the Chevaliers concentrated on the production of microscopes. During this time, Charles succeeded in constructing uncemented, achromatic lenses made from two crown bi-convex lenses and one flint bi-concave lens. In this, he followed the theories of Leonhard Euler (1707–1783).

By 1824, the painter Louis Jacques Mandé Daguerre had become a weekly visitor to the Chevaliers' shop. On one occasion, Daguerre informed them that he had succeeded in fixing an image using a camera obscura. This was followed, in 1826, by the visit of Colonel David Niépce, who wanted to buy a meniscus prism lens for his cousin, Nicéphore Niépce. The colonel informed the Chevaliers that his cousin had succeeded in fixing an image created by photosensitive means, and showed them an example. Two weeks later, an anonymous visitor arrived in their shop, and showed Charles an image that he obtained with a camera obscura. The man never returned, but the event reminded Charles of Daguerre's earlier claim. As a result, he informed Daguerre about the work of Niépce, suggesting that they contact each other.

Throughout 1826–1829, the Chevaliers sent Niépce a number of lenses, ranging from a prism meniscus, to a Wollaston-type periscopic meniscus, to an uncemented, achromatic bi-convex lens adapted from their microscopes.

In 1831–1832, Charles had series of quarrels with his father, with Charles claiming that he was poorly paid. This lead to a final break with his father's business in 1832, whereupon Charles set up shop in another part of Paris, at 163, galerie de Valois, Palais-Royal.

From 1832–1839, little is known about Vincent's activities. Charles, however, specialized in achromatic binoculars and telescopes, and relocated his business to 153, galerie de Valois, Palais-Royal. He also made lenses for Daguerre, who continued Niépce's research following Niépce's death in 1833. In particular, one lens consisted of a bi-convex crown glass element and flint glass bi-concave element cemented together, forming an achromatic, positive meniscus arrangement along the lines of a Wollaston periscopic lens. This would constitute the first lens sold in daguerreotype camera outfits in 1839.

Upon the announcement of the daguerreotype process in 1839, the demand for camera lenses was so great that Charles was unable to keep up with the demand. Consequently, production was taken over by a rival firm headed by Noël-Paymal Lerebours, who supplied the majority of the Daguerre-Giroux camera outfits with an inferior achromatic, plano-convex lens. Another problem was that the single achromatic lens was found to be impracticable for portraits, due to the necessity of using a stop in making the exposure.

Returning to an 1834 telescope design, the *Lunette à verres combinés* [Telescope made from combined glass], involving two achromatic lens elements separated in a tube, Charles modified the design so that it could be used at full aperture as a photographic lens. This was marketed in early 1840 as the *Photographe à verres combinés*, along with a folding camera design named the *Grande Photographe*. In addition to its being the first double, or portrait lens made for photography, the *Photographe à verres combinés* was also the first convertible, or variable focal length lens, consisting of lens components that could be taken apart and reassembled to obtain different lens formations with different focal lengths.

By early 1841, Charles's portrait lens was threatened by a rival, the Petzval portrait lens, marketed by the Viennese firm, Voigtländer. Adding to Charles's frustration was that the Petzval lens proved to be more popular with daguerreotype portraitists, since it allowed for shorter exposure times and a higher resolution at the center of the image.

On 29 November 1841, Vincent died, and the two estranged family businesses were reunited at Charles's Palais-Royal address.

Largely at Charles's instigation, in 1842, the Parisian *Société d'Encouragement* [Encouragement Society] began a comparative analysis of the relative merits of the *Photographe à verres combinés* and Petzval lens, to determine which one was the best. Not surprisingly, since Charles was a board member, the society sided with his *Photographe à verres combinées*, stating that its circle of definition covered a whole-plate, whereas the Petzval lens only covered a quarter-plate.

Still frustrated by the continued success of the Petzval

lens, and convinced that it was of similar construction, Charles entered a protest to the Parisian *Académie des sciences* [Academy of Sciences] claiming that the lens was an infringement upon his original, 1834 telescope design. A closer inspection proved that it was of independent design, consisting of an air-spaced rear component.

Also in 1842, Charles met Edmund de Valicourt for the first time. Valicourt, a photographer and technical writer, would become an important defender of the *Photographe à verres combinés*.

Up and until his death in 1859, Charles continued to make and sell the *Photographe à verres combinées*. He also published a number of catalogues and technical manuals during the period 1841–1854, on an almost annual basis. These provide a wealth of information about photographic equipment and processes of the period; however, they were also characterized by a continual need to justify and defend the primacy of his lens, whereupon he publishers letters by noted photographers attesting to their preference for his lens above all others. During the mid-1840s, Charles also become embroiled in a bitter dispute with his Parisian rival Lerebours, and the two sides traded lengthy insults in their respective publications. Upon his death in 1859, his son Louis-Marie Arthur Chevalier continued the business, which ultimately terminated with Arthur's death in 1872.

Alan Greene

See also: Daguerre, Louis Jacques Mandé; Lenses: 1 (1830–1850); Niépce, Joseph Nicéphore; and Petzval, Josef Maximilian.

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CHEVREUL, MICHEL-EUGÈNE (1786–1889)

French scientist/color theorist

In 1806, after studying chemistry at the Collége de France, Chevreul devoted his interests to organic substances at the Muséum National d'Histoire Naturelle Paris. By 1810, he was chosen as an assistant naturalist in the department of Garden Plants, a position which led to his appointment as chemistry chair, and a long affiliation as an instructor and administrator with the Muséum. He served as director from 1864–1879. His scientific discoveries included the development of margarine and stearine. Chevreul's findings revolutionized the production of soap and candles.

As director of dyeing at the Manufacture des Gobelins in 1824, Chevreul developed his color theories which were then publicly introduced in *The Principles of Harmony and Contrast of Colors and Their Applications to the Arts,* first published in France in 1839. His concept, the "law of simultaneous contrast of colors," in which complementary colors placed next to each other on a canvas are seen mixed in the eye of the observer inspired painters: Eugène Delacroix, Camille Pissarro, Claude Monet, George Seurat, and Robert Delaunay.

On October 25, 1847, at the Academy of Science, Chevreul's paper, "Considerations on the Reproductions by M. Niépce de Saint Victor's Process of Images that are Engraved, Drawn, or Printed," encouraged Abel Niépce, a cousin of Nicéphore Niépce, to work on new photographic processes and emulsions.

The Art of Living a Hundred Years; Three Interviews with Monsieur Chevreul…on the Eve of his 101st Year is considered the first photo interview. On September 5, 1886, *Le Journal Illustré* published a series of photographs (taken by Paul Nadar) documenting conversations between his father Nadar and the centenarian Chevreul. Each picture is captioned with Chevreul's witty response to Nadar's questions on the subject of being 100.

Margaret Denny

CHILD, THOMAS (1841–1898)

British engineer and photographer in China

Thomas Child was born in Shropshire, England in 1841to John (a mechanic) and Elizabeth. By 1851 his parents had moved to Greenwich in south London. He married Ellen in the mid 1860's and went on to work as a gas engineer with the Chinese Maritime Customs in Peking, China.

China had only been open to the West since the early 1860's and Child was in the second wave of pho-

tographers, following pioneers Felice Beato and John Thomson.

Child, who largely concentrated on photographing Peking and the north of China, produced around 200 images depicting the architecture of the city, along with some portrait studies. They formed a series entitled "In and Around Peking" and were largely made between 1875–77.

Child appears to have combined his photography with his position an engineer. His pictures were produced commercially, mounted on card with printed descriptive labels on the reverse and his name often appears marked in the negative, along with a date. His 10x8 inch albumen prints were well-composed and full of detail but lacked the visual quality of Thomson's work. His documentation of Peking was probably the most complete of any Far Eastern city in the mid 1870's.

He returned to London with his family in the early 1880's.

Ian Charles Sumner

CHILE

In 1840, the ship *L'Orientale* docked in Valparaiso, Chile. Aboard were French and Belgian students on a worldwide tour. Also aboard was daguerreotype equipment, belonging to Louis Compte, the ship's chaplain. A propós of the arrival of *L'Orientale*, a Valparaiso newspaper reprinted an article that had previously appeared in a Montevideo newspaper, on the subject of the daguerreotype process. Unfortunately, the *L'Orientale* sank shortly after its arrival and it was several years before Chileans became acquainted with this new marvel.

By the mid-1840s both foreign and native-born photographers were active in Chile. In 1845 the Helsby brothers (William, Thomas and John), two of whom were born in Argentina and one in England, arrived in Chile and operated successful studios in both Valparaiso and Santiago until the 1860s. William also traveled and photographed in other Latin American countries, including Uruguay and Argentina. Due to the quality and quantity of his daguerreotypes, he is considered the "grand old man" of the daguerreotype in Chile. The Helsby studio location was eventually owned by Carlos Rowsell, who for a time was engaged in a business collaboration with the famed Courret Hermanos studio in Perú. In 1854 Victor Deroche a Frenchman, opened a studio in Santiago. Several years later, Deroche and photographer Augusto Beauboef, traveled throughout Chile with the goal of producing the country's first photographic survey. Their work was published as *Viaje Pintoresco a Través de la República* (1856).

The first native-born Chilean photographer José Dolores Fuenzalida, began working in 1844 in partnership with Philogone Daviette and a Mr. Hulliel, and later opened his own studios in Valparaiso and Santiago. In the midst of a commercially successful career, Fuenzalida bought the famed Helsby brothers studio. This purchase led to an acrimonious legal battle with one of the Helsby brothers. Possibly weary of the protracted litigation, Fuenzalida died in 1857 at the age of forty-seven, after which his studio was managed for a time by his son Manuel Fuenzalida.

North American photographers active in Chile included Charles and Jacob Ward who arrived in Valparaiso in 1844, and were commercially successful due to the quality of their portraits. Their studio location was later occupied by compatriot Robert Vance who had studios in Santiago and Valparaiso between 1847–1850. Vance was one of the first daguerreotypists to work in the silver mining district of Copiapó in the Atacama Desert, and this experience may have influenced his decision to later leave Chile and sail north to photograph the California gold rush. The silver boom in Copiapó attracted a number of photographers including Esteban Adaro and Jorge Inchaurrandieta, as well as Enrique Dohrn who also owned a studio in Lima, Perú.

Arthur Terry arrived from New York via Perú in 1853 and several years later announced the availability of photographs on paper and "metal." Terry was an associate of Chilean photographer Cipriano Clavijo. The latter also worked with Jacinto Pedevill (or Pedevilla) and Ricardo Tosell. Among those who pioneered in the area of ethnic photography in Chile were the Frenchman Gustavo Milet (Millet) and the Canadian Obder Heffer. While managing studios in other locations, they also photographed the Mapuche people in the south of Chile. Salomón Adolfo Alexander, a German immigrant and his compatriot a Mr. Boehme, pioneered in the production of images on paper. He also recorded panoramic views of Valparaiso and Copiapó. He later relocated to Argentina where he and his descendants operated several prominent studios.

The Frenchman Pedro Emilio Garreaud, arrived in Chile via Perú in the early 1860s and managed a number of commercially successful studios. In association with Pedro Adams, Garreaud produced photo albums of Patagonia (1874) and Santa Lucia (1875). After Garreaud's death in 1875, his brother-in-law, Félix Leblanc operated the Garreaud studio with Esteban Adaro as his partner. In 1890, Leblanc sold his studio to Obder Heffer. Leblanc went on to publish his photographs as lithographs and photogravures and is remembered for his images of the Valparaiso earthquake (1906).

The Guerra del Pacífico (1879–82) between Chile against Perú and Bolivia was ably recorded by North American photographer Edward Spencer and his associate Carlos Díaz Escudero. Their work during the war, marks them as pioneers in the area of photojournalism

and their images of the conflict were widely circulated in photo albums. Díaz along with Carlos Renard and Federico Leiva, also pioneered in the production of cartes de visite in Chile.

Images of progress symbolized by railroads were recorded by Emilio Chaigneau and E. Cachoirs. Their work appeared in a book on the subject of the Santiago to Valparaiso Railway (1863). Thomas William Oliver, a Chilean of English descent who was trained as an engineer, photographed industrial locations and projects, including the Santiago to Quillota railway whose construction was supervised by famed railroad builder, Henry Meiggs. Oliver later immigrated to the United States and worked for the Kodak Company in the area of research and development.

Several women are known to have worked in the field of photography in nineteenth-century Chile. The most notable was Carolina B. de Poirie, who owned studios in Valparaiso and San Felipe in the 1870s and specialized in cartes de visite. Photo historian Eugenio Pereira Salas mentions one Mercedes Quiroga as active in La Serena at the turn of the twentieth century. Both Salas and photohistorian Hernán Rodríguez Villegas note that during the 1860s, Isabel Lagremoire, wife of photographer Ernest Charton was at times behind the camera. In the 1850s, artist Clara Filleul was responsible for "illuminating" photographic images in the studio of Victor Deroche.

Research on the history of photography in Chile is well underway. The extant literature on the subject includes Eugenio Pereira Salas's pioneer study of Chilean photography (1942). More recently, architect Hernán Rodríguez Villegas completed a substantial and years-long investigation on photographers active in Chile during the 19th century. His directory was published by the Centro Nacional del Patrimonio Fotográfico in 2001. The Centro under the Directorship of Ilonka Csillag, is dedicated to preserving the photographic heritage of Chile. It is also collaborating with six other South American countries to create a union catalogue of photographic archives and collections.

YOLANDA RETTER
WITH CONTRIBUTIONS FROM HERNÁN RODRÍGUEZ VILLEGAS

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CHINA

The earliest recorded reference to photography in China is contained in the Journal of Harry Parkes, quoted in Lane-Poole and Dickins's *The Life of Sir Harry Parkes* (1894, Vol. 1, 31). In his entry for July 16th, 1842, the fourteen-year-old Parkes writes: "Major Malcolm and Dr. Woosnam took a sketch of the place to-day on their daguerreotype. I cannot understand it at all: but on exposing a highly polished steel plate to the sun by the aid of some glass or other it takes the scene before you on to the plate and by some solution it will stay on the plate for years. It is no use me trying to describe it, it is quite a mystery." The photograph taken was of an unnamed town on the banks of the Yang-tse Kiang River, up which the British Expeditionary Force was making its way in order to obtain a treaty at Nanking. [Parkes and the amateur daguerreotypists were on board HMS *Queen,* and Major Malcolm was private secretary to Sir Henry Pottinger (HBM Plenipotentiary and Hong Kong's first governor) and was subsequently tasked with taking the signed Treaty to England]. Even if the daguerreotypes were successful, no trace of them appears in the British foreign office archives.

By way of background, Britain had just defeated China in the First Opium War (1839–42), and the Treaty of Nanking forced the opening of the five ports of Amoy, Canton, Foochow, Ningpo, and Shanghai for both trade and residence. Hong Kong island was also ceded to Britain, although it is worth remembering that Portugal had been in *de facto* control of Macau since the mid-sixteenth century.

The next earliest reference to photography appears in *Journal d'un voyage en Chine* (1848) where the author, Jules Itier (1802–77), described taking some thirty-seven daguerreotypes in Macau and Canton in 1844. These are now held by the *Musee Francais de la Photographie* and one example is illustrated in John Wood's *The Scenic Daguerreotype* (1995).

The first mention of a photo-studio in China that the writer has been able to find, is that of a Mr West, whose Hong Kong establishment was advertised in the *China Mail* on March 6th, 1845:

> Mr. West begs leave to inform the inhabitants of Victoria that he has opened a Photographic or Daguerreotype Room in Peel Street, near Queen's Road. His room will be open from 10am until 4pm. Single miniatures $3. $2 charged for each additional head in a group.

Another early studio is that of Hugh MacKay's, a Scotsman who took over an existing, but so far un-

identified, daguerreotype and lithographic Hong Kong business in 1846. His advertisements start to appear in the *China Mail* from October of that year. The earliest dated photograph taken by a Chinese is a daguerreotype portrait of General Ko-Lin which was auctioned in Christie's London on 19 October, 1994**.** The studio's printed label on this 1853 image carries the name of a Shanghai photographer, Lai Chong. The ships of Commodore Perry's 1852–54 Expedition to Japan spent some time in Macau in 1853. Eliphalet Brown Jr., the official photographer, was known to have taken photographs there but, to date, none has appeared. Another early view in the writer's collection is an 1857 photograph of the town of Canton, just prior to the allied bombardment in December of that year.

In Shanghai, the Frenchman Louis Legrand advertised his watch and clock-making business which also contained a photo-studio. The *North China Herald* issue of 15 August, 1857 carried the following:

> L. LEGRAND WATCH & CLOCK MAKER, near Mr. Smith's market. N.B.—PHOTOGRAPHS taken in the most elegant style.

By September, 1858 Legrand was advertising stereo portraits. He is also the photographer behind a commercial series of Shanghai-scenery stereo views issued in 1859 under the imprint of Legrand Freres & Cie. However, these are not the first commercial photographs of China to be published. That honour goes to the Swiss photographer, Pierre Rossier (1829–18??), who had been commissioned by Negretti and Zambra, a successful London-based firm specializing in the manufacture and sale of photographic and scientific equipment, to travel to the Far East and send back views for publication in Europe and America. Without naming either photographer, the periodical *La Lumiere,* in its 17 March 1860 issue, reviews the work of both artists. Rossier started putting together his Chinese stereo portfolio sometime in 1858; this consisted of approximately eighty-five views and portraits. Apart from two Hong Kong views, all the scenes were taken in Canton.

The American, Orrin Freeman (1830–66), arrived in Shanghai from Boston with his ambrotype camera and equipment in March 1859. His first decision was to open a studio inland at Soochow, rather than Shanghai. However, after a few months he was back in Shanghai issuing the following advertisement in the *North China Herald*:

> AMBROTYPES-AMBROTYPES. The undersigned respectfully begs to intimate to the Community that he is prepared to take the Ambrotype likeness in a style superior to anything hitherto offered in Shanghai. Charges low and satisfaction guaranteed. Yang-king Pang Road, next door to Messrs. H. Fogg & Co. ORRIN E. FREEMAN. Shanghai, 21st July, 1859.

But by December that year, Freeman had closed his studio and moved on to Japan. Commercial photography in China in the 1840s and 1850s does not seem to have been a very profitable enterprise.

William Nassau Jocelyn (1832–92) was an amateur photographer who was attached to Lord Elgin's suite during the latter's 1857–59 diplomatic missions to China and Japan. Jocelyn arrived in Shanghai in July 1858, taking up the post of assistant secretary and official photographer. He was replacing one Robert Morrison, who had been temporarily attached to Elgin's staff in China from April 1857. Very little is known of Morrison, incidentally, and his work may not have survived. A few of Jocelyn's Chinese photographs, however, can be found at the *Victoria and Albert Museum*, London.

Very little pre-1860 photography of China survives today. Apart from a handful of missionaries and foreign consuls, residents at the recently opened treaty ports and in Hong Kong and Macau were focused on making money, not on wielding cameras or patronizing studios. There were really no foreign tourists, and access to the interior of China was prohibited to all except a small band of foreign diplomats and those on official business. No doubt there was some demand for portrait photography, but those few foreign studios which did operate had to work very hard to make a living. And photography in China was never easy: The hot and humid summers played havoc with chemicals, and supplies of fresh water were not always easy to secure. Travelling inland over unmade roads meant risking damage to glass plates and equipment. Many Chinese were hostile to foreigners and there was a general superstition about photography's ability to conjure up evil spirits. Photographers and/or their equipment were, as a result, sometimes attacked. Nevertheless, by the 1860s the population in the various China coast settlements was increasing steadily and the demand for photography was consequently rising —albeit slowly.

Felix Beato (1834/5–ca.1907) arrived in Hong Kong in early 1860, intending to photograph the climax to the Second Opium War (1858–60). He was a seasoned and competent professional, used to overcoming the practical and technical difficulties of photography in intemperate climates. At Hong Kong he photographed the military build-up of the Anglo-French forces and produced some memorable panoramas. He moved on to Canton and photographed the city whilst waiting for the expedition to move north. In June and July more than 200 allied warships sailed north, and in August Beato photographed the aftermath of the storming of the Taku forts, south of Peking. Beato also photographed Peking itself, after the city was occupied, and he also captured views of the Summer Palace, just before it was destroyed and looted by the allied forces. These appear to be the earliest

photographic images of Peking so far discovered, and are of the utmost historical and cultural importance.

In Hong Kong, a succession of photographers opened and closed studios, often buying and selling their predecessors' stock and negatives. As a result, attribution of Hong Kong studio photographs from the 1860s and 1870s is often problematical. In 1860, Messrs. Weed and Howard set up a studio together, having travelled from California to do so. Charles Leander Weed (1824–1903) is remembered more for his California landscape photography and use of his mammoth-plate camera in various parts of the world. Weed and Howard (about whom little is known) were accompanied by Milton Miller, who initially went along as assistant. Weed and Howard didn't stay long in Hong Kong and moved to Shanghai and then to Canton, opening studios in both places. Miller had taken over the Hong Kong studio by January 1861, and he subsequently acquired Canton in September at which time Weed returned to America. Miller managed the Hong Kong studio until 1864, after which he also probably returned home.

Miller is becoming increasingly recognised as one of the key figures in early Chinese photography, even though almost nothing is known about him or his career. Although little of his landscape work has yet been identified, the *genre* portraits he took are celebrated for their often jarring intensity and also for the apparent empathy he felt for his Chinese sitters—be they coolie, mandarin, aristocratic lady or concubine. Miller also produced an interesting series of stereoviews of China and Japan, published by the American firm E. & H. Anthony.

John Thomson (1837–1921) is also fêted as one of the finest photographers of nineteenth-century China. He left his native Scotland in 1862, and travelled to Singapore where he began his photographic career. After moving his studio to Hong Kong in 1868, he used that as a base and embarked on a number of photographic tours in China. He photographed, amongst other places, Swatow, Amoy, and Foochow and sailed up the River Min to the city of Yenping. In 1870–72 he visited Peking and travelled up the mighty Yangtze Kiang River from Shanghai, stopping at Nanking and then on further upstream beyond Wuchang. His work was immortalized in a number of his books, principal amongst which were *Foochow and the River Min* (1873) and *Illustrations of China and its People* (1873–74). Thomson, like Miller before him, had respect and understanding for most of the Chinese he encountered, and this is reflected in his portfolio of sympathetic and sensitive portraits. Thomson was an exceptionally gifted photographer—equally adept at portraiture and landscape. He was the first to introduce the beauty of China's inland scenery to the West—a wonderful example being his work in and around Foochow. Thomson left China in 1872 and returned home.

At about this time the Chinese photographer, Lai Afong, was establishing his reputation. Thomson himself was impressed: "There is one China-man in Hong Kong, of the name Afong, who has exquisite taste, and produces work that would enable him to make a living even in London." Afong assiduously and successfully cultivated contacts amongst the foreigners in Hong Kong. As a result, many of his photographs were brought back to the West; they survive today and stand testimony to an extraordinary talent in both landscape and portraiture. He was active from ca.1859–ca.1900, and proprietor of the longest-lived studio in the Colony. Unfortunately, very little is known about his life, and his work has hardly been assessed.

A contemporary of Afong's was Tung Hing, about whom even less is known. Like Afong and Thomson, he produced some stunning landscape work around Foochow and the River Min. Again, his work has yet to be properly documented and appraised. Another major Chinese photographer based in Hong Kong was Cheung Mee (1890s–1920s). His work was of a very high standard, and he was also successful in attracting foreign patronage. His work was of a very high standard. Numerous other Chinese operated studios predominantly in the Queen's Road area; most of these, however, seem to have restricted their photographic activities to portraiture.

In Shanghai the Englishman, William Saunders (1832–92), ran a very successful studio. Opened in 1861 or 1862, it operated until at least 1887 producing quality *souvenir albums* of *genre* portraits and views—often finely handcolored. His only serious competition came from an L.F. Fisler, about whom little is known. In the 1880s, a Chinese photographer by the name of Tai Kung established a reputation by taking multi-plate panoramas of the Shanghai Bund.

We should also mention two expert photographers who spent very little time in China but who nevertheless made important contributions to Chinese photo history. The talented French amateur photographer and chemist, Paul Champion (1838–??), visited China in 1865–66 in order to collect zoological specimens. In the process, he put together a fine portfolio of scenes in Shanghai and Peking and these were published in large format and as a stereo series immediately on his return to Paris. Wilhelm Burger (1844–1920) was the official photographer to the Austria-Hungary Far East trade and diplomatic mission which arrived in China in 1869. The Austrian took a series of superb views and portraits, mainly in Hong Kong and Shanghai. Many of these are illustrated in Gert Rosenberg's *Wilhelm Burger* (1984).

One noted commercial photographer was St. John Edwards who operated out of Amoy from 1872 until at least the end of the 1880s. All that is known about him is that he produced a series of local views and also

photographed the Chinese and aborigines of Formosa. The Englishman, Thomas Child (1841–1898), was a gas engineer attached to the Chinese Maritime Customs in Peking. In his spare time he compiled a series of some 200 views of the capital, together with *genre* studies of local Chinese. His albums were very popular and a number have found their way into institutional holdings.

In closing, it is worth making the point that, in reality, relatively little is yet known about the history of Chinese photography, and the work of the key Western and Chinese photographers has yet to be properly researched and chronicled. In twenty years from now, however, we will surely still be celebrating the work of Louis Legrand, Pierre Rossier, Felix Beato, Milton Miller, John Thomson, William Saunders, Lai Afong, Tung Hing and Cheung Mee. It will be interesting, however, to see who else is added to this list.

TERRY BENNETT

See Also: Itier, Jules; Brown Jr, Eliphalet; Rossier, Pierre; Negretti & Zambra; Freeman, Orrin; Jocelyn, William Nassau; Beato, Felice; Weed, Charles Leander; Anthony, Edward, Henry and Tiebout; Thomson, John; Lai Afong; Saunders, William; Burger, Wilhelm A.; and Child, Thomas.

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CHIT, FRANCIS [KHUN SUNTHONSATHITLAK] (1830–1891)

Thai photographer

Francis Chit, a Thai-Christian born in Bangkok in 1830, learnt the daguerreotype process c.1847, from French Bishop Jean-Baptiste Pallegoix (1841–1862) changing to the collodion wet plate a decade later. In 1863 he opened his first studio on a houseboat at Kradee Cheen village in front of the old Portuguese Santa Cruz church, then the heart of international affairs in Bangkok. He was appointed court photographer firstly to King Rama IV, and promoted *Khoon Soondr Sadis Lacks* (officer for fine likeness image) by King Rama V in 1866.

Images based on Chit's early works appeared—uncredited—in the 1883 edition of naturalist Henri Mouhout's classic "Voyage dans les royaumes de Siam, de Cambodge, de Laos et autres parties centrales de l'Indo-Chine 1858–1860." (*Tour du Monde*, v. 111, nos. 196–204, Paris, 1863). His works were widely reproduced, being invariably claimed by—or misattributed to—other photographers including; Wilhelm Burger, John Thomson and W. K. Loftus. Francis Chit died of cholera in 1891.

Chit's work constitutes the major photographic record of Thailand in the second half of the 19th century, and includes portraits of royalty and royal events, views throughout Thailand, including his great 6-part panorama of Bangkok of 1863/4, and astronomical photographs of the solar eclipse in 1868. His 1877 catalogue lists over 9,000 images. There are over 2000 glass plate and large format negatives preserved in the National Archives of Thailand.

PHIPHAT PHONGRAPHIPHON

CHOISELAT, MARIE-CHARLES-ISIDORE (1815–1858) AND RATEL, FREDERIC PATRICE CLEMENT STANISLAS (1824–1904)

French daguerreotypists

Choiselat and Ratel were born in Paris ten years apart: the first, Charles Marie Isidore Choiselat, on February 13, 1815, to a family of bronze manufacturers, who specialized in religious articles (the Choiselat house); the second, Frederic Patrice Clement Stanislas Ratel, was born on March 20, 1824.

Little is known of their backgrounds. Their first writings and communications reveal, from 1840, solid scientific knowledge. Stanislas Ratel for his part was a

Choiselat, Marie-Charles-Isidore; Stanislas Ratel. The Pavillon de Flore and the Tuileries Gardens.
T*he Metropolitan Museum of Art, Gilman Collection, Purchase, The Horace W. Goldsmith Foundation Gift, 2005 (2005.100.29) Image © The Metropolitan Museum of Art.*

pupil of the School of mining engineering in Paris, between 1842 and 1846, the year he received his diploma. In addition it is likely that Choiselat had knowledge in chemistry. The two men undertook research in the field of alchemy, on the transformation of metals into gold. It is not impossible that the two men came to photography by the means of alchemy.

The various communications, which they addressed to the Academy of Science in the first half of the 1840s, remains the principal source used to reconstruct their direction and work. March 16, 1840, Arago presented in front of the Academy two daguerreotypes; Arago would have praised them as admirable images taken by Choiselat. On this date, it would seem that the latter had taken some tests in the field of the daguerreotype with the chemist Paul Pretsch and later started his collaboration with Ratel. According to Choiselat these images were fixed by means of a particular process.

In this period, following the contest launched by the *Société d'encouragement à l'industrie nationale*, the two men endeavored to solve various technical problems preventing the industrial and commercial rise of daguerreotype. In 1841 they conducted engravings according to the process recommended by Fizeau. Their works, submitted at the end of 1842 to the *Société d'encouragement pour l'industrie*, won them a medal and a prize the following year. The first known plates of the views of the beaches of Tréport remain from this period.

In 1843, the two men developed an accelerating liquid of bromoforme, combining bromine with hydrogen, carbon and other substances similar to the alcohol which, according to their statements, created images "in less than two seconds." They presented three papers on this subject in front of the Academy of Science and ensured the diffusion of their invention by the means of *Soleil et Chevalier*.

The same year, these two men presented plates at the *l'Exposition des Produits de l'Industrie de Paris*, even if their names did not appear among the official exhibitors. The essentials of their work were published in the summer as an anonymous work, *Essai de théorie daguerrienne et résultats pratiques par un professeur de Sciences,* and Charles Chevalier included one their communications with the Academy of Science in its *Mélanges photographiques*.

The following year, in the summer and the beginning of the autumn 1845, Choiselat accompanied Ratel on a voyage at the end of their completed studies, along with two of their colleagues on behalf of the School of the Mines. Their tour, in the form of loop, led them from Auvergne to the Cantal, through the Alps (Grenoble, Gap), and to the South and the western south of France (Toulon, Marseilles, Nimes, Arles, Montpellier, Sète). It was during the three and a half months of this voyage that they took the majority of their pictures now known as views of the valley, (sight of the town of Die, panorama in 3 plates July 21, 1845) and of the Alps, as well as images of the various ports (Marseilles, Sète and Toulon (panorama in five plates of the roads of September 15, 1845) and monuments of Provence (arenas of Nimes, amphitheatre of Arles, cathedral of Rodez). The collection manifests a predilection for the

panoramic format carried out in juxtaposition to the format of plates sized 12,5 × to approximately 18,5 cm. Some images testify, in addition to the views of Dié and of the roads of Toulon, a view of the arenas of Nimes and amphitheatre of Arles as well. In January 1846 Arago, presented in front of the unquestionable Academy of Science the images taken during this period, which again were considered "very admirable ones."

Their last known work, "La Grande galerie du Louvre et les quais de la Seine" and "Le Pavillon de Flore et les Tuileries" were dated 1849. Currently, it is difficult to say if they continued to practise photography beyond this point. The complete absence of their names in critical reviews by the Academy of Science, the press, as well as their separate personal accounts, especially after this date, would imply that their collaboration stopped at this time.

In 1848, Ratel left Paris for Tours and joined the company of the railroads Paris-Orléans as an engineer. Two years later he married Marie-Angel Zoe Choiselat, the sister of Charles. The latter died on December 20, 1858 in Paris, 34 street Cassette. Ratel survived him for nearly the fifty years.

In 1847, the daguerreotypist Thierry in his shortened *Histoire générale abrégée de la photographie,* (general History of photography), placed them in fifth position among the "remarkable daguerreotypists," behind Fizeau, Séguier, Claudet and Gaudin. Since then, their names have become forgotten. Their production that is now known is made up of only approximately thirty images, mostly of landscapes and images of architecture of South-east and South of France and images of Paris. It is necessary to add that some plates were erroneously attributed to one of their parents who moved away, François Adolphe Certes. Of their talent as portraitists and hired by their contemporaries, one knows today of only two examples which are two extraordinary self-portraits. Among the collections of institutions, one finds examples at the musée Carnavalet among them, with the museum of Orsay, the musée français de la photographie de Bièvres, with the musée Réattu à Arles, l'Agfa-foto Historama de Cologne, the Cana Centre canadien d'architecture de Montréal like in Getty Museum, and Metropolitan Museum of New York.

QUENTIN BAJAC

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CHRONOPHOTOGRAPHY

The term chronophotography applies to a loosely constituted group of photographers who used the medium to freeze rapid action for analysis and study. Emerging from the instantaneous photography movement, chronophotography is distinguished by the use of various measurement systems to quantify distance travelled in a short period of time. Although it is occasionally used to describe twentieth-century practitioners such as the time photographers Harold Edgerton (1903–90), the term is mainly used to describe those who worked shortly after stop-action photography first became possible. The term appears to have been coined by the French scientist and photographer Etienne-Jules Marey and consequently it is sometimes wrongly asserted that chronophotography began with his time photography experiments on the 1880s. However, Marey was just one of a number of practitioners who worked around the same time in a similar vein. No precise dates can be established for the existence of chronophotography; however, it can be said to have flourished from the 1870s to the turn of the twentieth century. The photographers most often associated with chronophotography are Eadweard Muybridge, Etienne-Jules Marey, Georges Demeny, Albert Londe, Thomas Eakins, and Ottomar Anschütz.

Chronophotography depended on two separate technological developments: instantaneity and automatic exposure. Photographic materials common in photography's first four decades, including Daguerreotype, paper negative, waxed paper negative, and wet-plate collodion, required substantial exposure times to register a sharp image. Photographers struggled to capture even slow-moving objects such as ocean waves or flags flapping in a breeze. Hundreds of minor advances in chemistry and optics during these years gradually reduced exposure times, but it was not until the introduction of gelatine dry-plate negatives (commercially introduced around 1880) and bromide chemistry (invented 1879) that exposures exceeding the capacity of the unassisted eye became commonplace. One notable exception to this is in the area of flash photography. Even with slow materials, phenomena briefly bathed in extremely bright light such as a spark or thunderbolt will still register on the plate; William Henry Fox Talbot demonstrated this principle at a lecture before the Royal Institution in 1851.

There is some foreshadowing of the chronophotography

movement in the fields of astronomical and anthropological photography. In astronomy, photographers including John Herschel, Samuel D. Humphrey (active 1850s), John Adams Whipple (1822–91), and Warren de la Rue (1815–89) photographed the progression of heavenly bodies through the night sky in the 1850s and 60s. Although the subjects of their research were comparatively slow moving, they were also dimly illuminated, which made them especially challenging subjects. The French photographer Jules Janssen (1824–1907) devised a machine called a photographic revolver in 1873, which famously enabled him to photograph the transit of Venus across the face of the Sun while in Japan in December 1874. The design of the device, which recorded a series of images in succession on a circular glass plate, was influential to later chronophotographers, especially Etienne-Jules Marey. Although anthropological photographers were not as interested in sequential imagery, throughout the 1850s and 60s they created systems for recording comparative measurements photographically. Such photographs have been described as photometric, or anthropometric. In Britain, Thomas Henry Huxley (1825–95) and Lord Granville Leveson-Gower (1815–91) spearheaded a project to photograph the peoples of the British Empire through the offices of the Colonial Office beginning in 1869. Huxley's protocol for making these photographs involved placing a clearly marked measuring stick of uniform size and distance next to a nude subject and parallel to the picture plane, so that precise dimensions of skeletal and muscle size could be calculated. The anthropologist J. Lamprey (active 1860s) introduced an alternative system in a meeting before the Ethnological Society of London in 1869. Lamprey advocated the use of a gridded backdrop with both horizontal and vertical markings so that measurements could be obtained easily in any direction. Though this system was flawed in that the sitter could skew the results by standing relatively close or far away from the camera, it gained currency and was applied by Eadweard Muybridge in his *Animal Locomotion* photographs of 1884–5.

The inclusion of Muybridge in the ranks of chronophotographers is somewhat problematic. His contributions to stop-action photography are indisputable, and he arguably exerted more influence over the rise of chronophotography than any other figure. However, unlike most of his colleagues he lacked scientific training and never achieved the rigor of his contemporaries. Muybridge's photographs of moving horses and other animals began in California in the 1870s in the purpose-built laboratory funded by railway magnate and politician Leland Stanford and constructed by a team of engineers. While he was ideally equipped to conduct locomotion experiments and often presented his findings in a scientific context, in fact the power of his images lay in their visual appeal, refined by his acute artistic sense. This became increasingly apparent with his work at the University of Pennsylvania from 1884–5, in which he occasionally inserted or deleted plates to create more compelling grids. Muybridge was criticised in scientific circles for his superficial understanding of biomechanics, and his invariable tendency to emphasise style over substance. Still, his photographs did contain metric grids intended to permit the recovery of photometric data, and were executed at carefully timed intervals. Interestingly, Muybridge's initial approach may have been inspired partly by Oscar Rejlander, who published a paper outlining a strategy for photographing moving horses in the *British Journal of Photography* in 1873.

The French scientist Etienne-Jules Marey was the central figure around whom chronophotography coalesced. Starting in the late 1850s, Marey had been working to devise mechanical means to record human and animal activities. At first he contrived non-photographic methods to accomplish this, beginning with his sphygmograph (a kind of heart monitor) in 1860. In the ensuing decade he perfected numerous related devices which enabled him to automatically record physiological effects; most involved marks registered on paper attached to a revolving drum resembling a seismograph or hydrothermograph. He described these techniques as 'chronography.' As his investigations expanded into the field of human and animal locomotion he eventually adopted photography as a recording device. In a play on his earlier term he described these experiments as 'photochronography' and ultimately 'chronophotography.' Marey developed several techniques for making chronophotographs, including his 'photographic gun,' based on the photographic revolver of Jules Janssen. Marey's photographs were invariably exposed on a single plate, with images either separate or superimposed on each other. This prevented the kind of photomanipulation of which Muybridge was accused. Working at the College de France, Marey's laboratory thrived. It launched the careers of a number of students who became prolific chronophotographers in their own right, including Georges Demeny, Albert Londe, and Lucien Bull (1876–1972).

The Prussian photographer Ottomar Anschütz worked contemporaneously to Marey, using animals as his main subjects. Because he was interested in photographing natural interactions between animals, Anschütz did not include measuring grids in the frame as Marey and Muybridge did. His skill and equipment were unsurpassed; his photographs are the sharpest and most detailed of any chronophotographer. Whereas Muybridge was often reduced to photographing mere silhouettes, Anschütz produced images of striking beauty, delineating exact areas of muscular tension and even individual hairs in an animal's fur. His electrotachyscope of 1887 was a

stroboscopic projection device for animated loops of photographs and represented a considerable advance over Muybridge's zoopraxiscope.

Best known as a painter, Thomas Eakins is sometimes also identified as a chronophotographer. A direct associate of Muybridge, Eakins lobbied for him to move his researches to the University of Pennsylvania in 1884 and was assigned to supervise him during his residency. However, Eakins preferred Marey's more scientific techniques, and distanced himself from Muybridge's laboratory. Eakins was not as prolific as other chronophotographers, and those images that do exist closely resemble Marey's. However, Eakins used fine photographic papers including platinum prints to give his pictures added visual impact.

A number of other photographers who worked principally at the turn of the twentieth century are often associated with chronophotography. Peter Salcher (1848–1928) was an Austrian photographer worked with the physicist Ernst Mach (1838–1916) to take photographs of airwaves created by bullets in flight. British photographer Charles Vernon Boys (1855–1944) made similar photographs of speeding bullets breaking glass and other objects. In the 1890s John William Strutt (1842–1919, known as Lord Rayleigh) photographed a stream of water emerging from a tap and breaking into drops. Arthur Mason Worthington (1852–1916) photographed splashes at the Royal Naval Engineering College, including a drop of water falling into milk.

PHILLIP PRODGER

See Also: Instantaneous Photography; Muybridge, Eadweard James; Marey, Etienne Jules; Demeny, Georges; Londe, Albert; Eakins, Thomas; Anschütz, Ottomar; Waxed Paper Negative Processes; Talbot, William Henry Fox; Herschel, Sir John Frederick William; Janssen, Pierre Jules César; Rejlander, Oscar Gustav; Bull, Lucien George; and Platinum Print.

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CHUTE AND BROOKS

Chute and Brooks is the commercial name of an association of two American photographers: Charles Wallace Chute (1846–1923) and Thomas Brooks. Chute arrived in Montevideo from Boston (Massachusetts) in 1865 and started the company with Brooks in 1868. They had studios both in Argentina (Buenos Aires and Rosario) and Uruguay (Montevideo), and become famous for the quality of their portraits.

They used the standard formats, mostly carte-de-visite, portrait-cabinet, and also made stereoviews. They published views of several cities, such as Montevideo, Rosario, and Buenos Aires. At the beginning of the twentieth century, they installed studios in Rio de Janeiro, Brazil; New York,USA; and La Havana, Cuba.

In Chile (1875) and France (1878), they received medals for the quality of their works exhibited in international fairs.

Early views from Montevideo in carte-de-visite by Chute and Brooks are preserved in the Biblioteca Histórico-Científica, Buenos Aires.

ROBERTO FERRARI

CIFKA, WENCESLAU (1815–1883)

Born in Prague in 1815 came to Portugal in 1836 when Ferdinand of Saxe-Coburg-Gotha married the Portuguese queen Mary. He became known as a painter, drawer, potter, collector and patron of the arts. He was one of the pioneers of Portuguese photography, making daguerreotypes since the 1840's. He settled in a permanent studio in Lisbon, in 1848, just after the Portuguese Civil War, where he portrayed, using the daguerreotype process, an important part of Portugal's highest society. Among his sitters was his friend the King Ferdinand, photographed in an armor and helmet. He was the official photographer for the King.

The daguerreotype was still in use in Portugal, during

the 1850s when other process where replacing it in other parts of Europe. Portuguese society was just starting its modernization, made possible by the consolidation of liberal government. Cifka was, most likely, the publisher of the first stereoscopic views of Portugal and participated in the mid nineteenth century most important exhibitions: The 1849 *Exposição Industrial de Lisboa*, the 1851 *Exposição Filantrópica,* the 1867 *Exposition Universelle de Paris*, among others. He also made an album with the major sculpture works of the Mafra National Palace, one of 18th Century's major monuments.

Cifka had a major role in the popularization of photography in Portugal; he had many students, including the King Ferdinand and (according to Portuguese culture and art historian, José Augusto França) Carlos Relvas, the best known 19th century Portuguese amateur photographer. His images were mostly lost and few are known today.

NUNO PINHEIRO

CIVIALE, AIME (1821–1893)

Aimé Civiale was born in Paris, in 1821 and was not a professional photographer, but a geologist. He studied sciences in the famous French Polytechnique School.

In 1857–1858, he began to photograph the Pyrénées. The same year he became a member of the Société française de photographie. Civiale regularly presented his research at the French Academy of Sciences. But he is especially known as the photographer of the Alps that he studied between 1859 and 1868.

As an engineer, he did not use his photography practice only as a proof of his geological research, but also as a way to show new landscapes and to keep traces of them before erosion makes them change. In these extreme conditions, photographs were particularly difficult to realize. Despite using aluminum for the lens's frame instead of copper, he had to bring with him up to 550 lbs. of photographic devices.

In this environment he could not use the wet collodion plates. He then decided to choose Gustave Le Gray's technique, using waxed paper for the negatives, technique that he later improved by adding beeswax to paraffin. He also built a camera able to represent the 360 degrees view in forteen panoramic images.

Aimé Civiale died in Paris, in 1893.

MARION PERCEVAL

Exhibitions

Royal Photographic Society, London, 1858.
Third Exhibition of the Société française de photographie, 1859.
Fourth Exhibition of the Société française de photographie, 1861.
Fifth Exhibition of the Société française de photographie, 1863.
Sixth Exhibition of the Société française de photographie, 1864.
Seventh Exhibition of the Société française de photographie, 1865.
Eighth Exhibition of the Société française de photographie, 1869.

CLAINE, GUILLAUME (1811–1869)

Belgian photographer

Guillaume Claine was born in the small southern Belgian town of Marche-en-Famenne on 12 January 1811. An obscure provincial upbringing was followed by a two-year stint as an editor on the liberal Brussels daily *L'Observateur* around 1841. Several attempts to promote his career within the Belgian administration came to naught, and, suffering from ill health (the nature of which was never specified), he gave up journalism. Together with his wife, Augusta Van Buggenhoudt (1810–1871), Claine moved from the centre of Brussels to the outlying commune of Saint Gilles on 10 July 1845, where he was registered as a law student, and then to nearby Molenbeek on 19 May 1847, where their only child Auguste Emile was born on 10 June 1847. Claine earned his living as a court stenographer, while referring to himself as a man of letters.

By this time, Claine was devoting his leisure time to the calotype. He entered into collaboration with Louis Jacopssen (1797–1877), an artistically inclined arboriculturist and landowner who ran the domaine de Bloemendael, a rural estate near Bruges. They made excursions together, to Bruges, Ghent and Brussels, view-taking and print-making as dedicated amateurs. Their most notable achievement was a series including views of the royal palace at Laeken, to the north of Brussels, the resultant salt prints characteristically retouched to suggest billowing clouds. Claine wrote: "nous avons vécu des mois entiers dans la chambre noire… la phot[ographie] nous a fait dépenser en deux années quelque chose comme trois à quatre mille francs" [we have lived whole months in the dark room… phot[ography] has made us spend in two years something like three to four thousand francs] (letter to Joseph-Ernest Buschmann dated 24 December 1849).

Claine, ambitious and impecunious, had become a competent landscape photographer, and cast around for a way to profit from his skills. Rather than opening a studio, at a period when the daguerreotype was still the only widely accepted process in Belgium and portraiture its sole commercially viable application, Claine began lobbying the Belgian government for a subsidy. He addressed a formal request to the Interior Minister, Charles Rogier (1800–1885) in October 1849, and in parallel publicized his efforts in the Brussels press, not least *L'Observateur*, which praised the quality of the prints: "Entre autres

perfectionnements ingénieux découverts par ces deux habiles photographes, ils ont trouvé le moyen de prendre, avec un objectif ordinaire, des images de toute grandeur et sans déviations" [Among other ingenious improvements discovered by these two skilled photographers, they have found a means of taking, with an ordinary lens, images of all sizes and without distortion] (*L'Observateur*, 29 October 1849). Large prints were a speciality, as attested by one surviving example, featuring the Brussels town hall, which measures 77 × 66.5 cm.

Rogier referred Claine's request to the Académie royale de Belgique [Royal Academy of Belgium], which set up a commission to investigate the matter. While Adolphe Quetelet (1796–1872), the influential secretary of the Academy, expressed his scepticism, Claine found a staunch defender in Joseph-Ernest Buschmann (1814–1853), man of letters, publisher and himself an experimenter in photography. Buschmann's intervention in Claine's favour was decisive in persuading the Academy to adopt a motion that "la photographie sur papier peut devenir une auxiliaire des plus utiles pour les sciences et pour les arts, et qu'elle mérite en conséquence de recevoir les encouragements du gouvernement" [photography on paper can become a most useful aid for the sciences and the arts, and consequently deserves to receive the government's support] (*Le Moniteur belge*, 12 January 1850).

Unable to fix a fee per print, the Interior Ministry awarded Claine the lump sum of 1,250 francs. Claine used the award in part to finance a study trip to Paris, where he spent most of May 1850 familiarising himself with the latest innovations, selecting a lens for field work more efficient than any obtainable in Brussels, and meeting leading practitioners including Gustave Le Gray. Abel Niépce de Saint-Victor initiated Claine into his albumen-on-glass process, which led Claine, on his return to Brussels, to make a somewhat hasty pronouncement: "Jetez la photographie sur papier au feu! Le verre a triomphé!" [Throw paper photography onto the fire! Glass has triumphed!] (letter to Joseph-Ernest Buschmann dated 8 August 1850).

Claine's championing of this new process would have fateful consequences. Following their initial contacts the previous year, Buschmann had entered into a prolific correspondence with Claine and Jacopssen on their shared interest. He now began an intense practical collaboration with Claine, the purpose of which was to commercialise the albumen process. Their attempt to construct a machine for albumenizing glass plates failed, and further experiments were brutally curtailed in November 1850 when Buschmann was committed to a mental asylum. Among the reasons advanced by his family for his medical state was "…une idée fixe, mal fondée du reste, de gagner des millions par de nouvelles découvertes dans cette science" […a quite baseless obsession with making millions through new discoveries in this science, i.e. photography].

Bereft of his collaborator, Claine completed the assignment for the Interior Ministry in 1851, the first state commission granted to a photographer for drawing up an inventory of Belgium's cultural heritage. This landmark achievement was repeated the following year when Claine made a further series of 44 views of monuments and sites for the municipality of Brussels, at 60 francs per print. Claine's final legacy is a series of ten plates published by L.-D. Blanquart-Evrard in 1854, under the title *Bruxelles Photographique*. Measuring up to 48 × 36 cm each and priced at 10 francs apiece, they were the largest and most expensive prints produced by the Lille establishment.

On 31 August 1853, Claine moved back into Brussels. Abandoning photography along with his freelance status, he was appointed a municipal clerk. Photography had outgrown the opportunistic enthusiast fortunate enough to benefit from public subsidy. Guillaume Claine ended his days as a museum caretaker, dying in Brussels on 1 March 1869.

No comprehensive set of the Interior Ministry commission of 1851 has been located, but the Bibliothèque Royale Albert Ier, Brussels, owns several prints, as does the Musée de la Photographie, Charleroi. The Brussels municipal archives possess the full series of views commissioned in 1852, and the Bibliothèque municipale, Lille, has a complete copy of *Bruxelles Photographique*. The Museum voor Fotografie, Antwerp, owns Buschmann's surviving salt prints, as well as the manuscripts composing Claine and Jacopssen's correspondence with him, along with an annotated transcription in typescript.

Steven F. Joseph

Biography

Evrard-Guillaume Claine was born in Marche-en-Famenne, province of Luxembourg, Belgium, on 12 January 1811. A failed journalist, he was working as a court stenographer when he began practising the calotype around 1847. Specialising in landscape work, he entered into two significant collaborations, firstly with Louis Jacopssen (1797–1877), an artistically inclined landowner from Bruges. Claine's correspondence with Joseph-Ernest Buschmann (1814–1853), man of letters and publisher in Antwerp, plots their joint experiments and pivotal steps in the introduction of glass-plate photography to Belgium in 1850. Claine's series for the Interior Ministry completed in 1851 constitutes the first state commission granted to a photographer for drawing up an inventory of Belgium's cultural heritage. In 1852 Claine made a series of 44 views of monuments and sites for the Brussels municipality. Claine abandoned

photography by 1855 and ended his days as a museum caretaker, dying in Brussels on 1 March 1869.

See Also: Le Gray, Gustave; Niépce de Saint-Victor, Claude Félix Abel; and Blanquart-Evrard, Louis-Désiré

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CLAUDET, ANTOINE FRANCOIS JEAN (1797–1867)

Henry Snelling, editor of *The American Photographic Art Journal* March 1868, 47, wrote of Claudet:

> 'M.Claudet is not only one of the most theoretical but practical daguerreotypists of Europe. His whole soul seems wrapped up in the study of his art; instead of making it a mechanical business, he raised it to its proper sphere amongst the arts and sciences.'

Antoine Claudet was born at the *Chateau de Rosay, Lyon*, France in August 1797 at the end of the France Revolution. The second child in a family of six, he was brought up mainly by his mother from the age of 10, as his father died in 1807.

When he was 21, Claudet moved to Paris to work as a banker for his uncle, M. Vital Roux. In Paris Claudet married Julie Bourdelain, a French girl whose family had moved to England. In 1825, Claudet was appointed co-director with George Bontemps (his wife's nephew), of M. Ponces Grimblot's glass works outside Paris. Following on from this, in 1828 Claudet moved to 89 high Holborn, London to import shades and sheet glass manufactured in Choisy le Roi. It was through this introduction to glass thatClaudet first showed his creative skills as an inventor, when in 1833 he invented a machine for cutting cylindrical glass, which was later to be awarded a medal from the *Society of Arts*.

In 1837. George Houghton joined with Claudet to set up Claudet and Houghton, an importing company for the wholesale and retail of glass.

In the autumn of 1839 on hearing about Louis Jacque Mande Daguerre's photographic discovery, Claudet went straight to Paris on the advice of the optician, Noel Marie Paymal Lerebours. Claudet took lesson from Daguerre himself, learning the complete daguerreotype process before buying a licence from him for £200, which enabled him to perform the process in England.

In 1840 Claudet and Houghton were the sole importers of camera equipment and daguerreotypes in England. They began selling daguerreotypes imported from Paris for one to four guineas. In April of that year Claudet sent a selection of daguerreotypes of European cities and other scenes to Queen Victoria and Prince Albert. They bought the best of them and the remaining pictures were put in an exhibition at the Royal Society. In July of 1840 Claudet took pictures of some of the first daguerreotype views of London.

In 1841 Claudet opened his first portrait studio on the roof of the Adelaide Gallery in London and began taking portrsits for the first time. The glass house was constructed from blue glass to improve the lighting. Later in life, Claudet described to Thomas Sutton what was required to be a photographer:

> 'To achieve success in photography requires the chemical knowledge of a Faraday, the optical knowledge of a Herschel, the artistic talent of a Reynolds or a Rembrandt, and the indomitable pluck and energy of a Hannibal.' *The British Journal of Photography*, 30 August, 1867, 413–414.

At the time when Claudet first practised photography, the long exposure times required, made it difficult to achieve good and natural portraits. Often sitters looked serious and uncomfortable. Sittings could be hard to endure. Claudet endeavoured to speed up the process of photography and in May 1841, he discovered that by combining chlorine and iodine vapours the sensitivity of the plate was increased. By using this process, he was able to reduce the exposure time from two minutes to a few seconds. Claudet may not have been the first to discover this, he was however the first the publish the findings in a report to the *Academie des Sciences* in Paris and communicated them to the *Royal Society* on the 10th of June. Priority of publication was of all importance and throughout his life, Claudet was eager to make his discoveries known.

It is thought that Claudet could not afford the entire patent for the use of the daguerreotype process in England, which would have cost £900. Instead an English

entrepreneur Richard Beard, purchased the patent and then offered Claudet £200 to cease practising. Claudet refused and on 15 July 1841, Beard issued a court injunction against him. But the law was on Claudet's side and stated that although the patentee had to buy the licence, the licencee was not obliged to sell it. The injunction was dissolved. This loophole, fortunately for Claudet, allowed him to continue producing daguerreotype s freely with no obligation to Beard.

At the end 1841, Claudet took out patents for the use of painted backdrops, the red light in the dark room and artificial light. By this time Claudet was considered both technically and artistically, the most skilful portrait photographer in London. And in the same year, Claudet took what are considered the first instantaneous photographs ever taken. The subject was the members of the Italian Opera in ballet poses.

In October Claudet was approached by William Henry Fox Talbot to use Talbot's *calotype* process. He adopted it for a short time but soon returned to the daguerreotype as he was not happy with the inferior quality that the paper *calotype* image produced.

With official permission, in 1842 Claudet climbed to the summit of the Duke of York's column, between St. James Park and Pall Mall and produced a series of daguerreotypes of the panorama of London. A wood engraving of these was printed in *The Illustrated London News January 1843* to promote the publications first six months in operation. Six wood blocks were used to produce the print, which measured three by four feet.

In 1843, Claudet spent several months in Paris, where he bought a *Petzval lens* which had a wider aperture to reduce exposure times.

In 1844 Claudet exhibited his 'multiple portraits' at the *Exposition de Produits de l'Industrie Francaise*. Claudet had out grown his studio at the Adelaide Gallery, so he moved across to 18 King William St, at the adjoining corner of the Adelaide Gallery. At this new studio in 1845, Claudet employed the miniaturist painter L.Mansion to colour daguerreotypes. Two years later, Claudet opened another studio, The Colosseum, Regents Park, London.

In 1848 Claudet invented the *photographometer* to measure the sensitivity of light. This was the first light meter. Following on from this in 1849, he invented the focimeter, an instrument used to aid focusing.

In 1850 Claudet invented the *dynactometer*, a device used to compare the speed of different lenses.

Claudet opened what was to be his last studio in 1851. He called it the "Temple of Photography," and it was one of the grandest studios of its time situated at 107 Regent's Street, London. The French artist Herrien described the interior as the most elegant in London. Renovations were carried out by Banks and Barry, architects, who had designed the Houses of Parliament. The interior was designed in an Italian style, the reception rooms with a series of murals showing the history of photography and stereoscopy. This included fourteen medallion portraits of photography inventors.

After the invention of the *lenticular stereoscope* in 1849 by Sir David Brewster (1781–1868) many of the leading photographers of the time turned their attentions to the stereoscope which was a device for viewing photographs which gave an illusion of depth. Claudet was one of the most enthusiastic of its followers and before the invention of the *binocular camera*, Claudet developed a way of achieving the desired effect with two cameras side by side. In 1851 at the Great Exhibition in Crystal Palace, Claudet exhibited a selection of stereo daguerreotypes alongside Dubosq's stereoscopes. Queen Victoria was greatly impressed by the novel effect given by this new invention and Claudet sent a selection of these pictures to her as well as to the Czar of Russia. As a pioneering scientist Claudet devoted himself to the improvement and the advancement of stereoscopy and was largely responsible for the extent of its popularity.

Among some of Claudet's most prestigious sitters at this time were, Queen Victoria, the Prince of Wales, Charles Dickens, Charles Babbage and he also produced one of the only known portraits of the first Duke of Wellington.

In 1852, Claudet began his exploration into moving image when he put pictures of himself taking off a hat, and he put these on a *pneumatoscope* to give an illusion of motion.

In 1853 Claudet was appointed *Photographer in Ordinary to Queen Victoria*. In the same year he became a member of the *Royal Society of London for the advancement of science* after his entry *"The Application of the Stereoscope to Photography.*" In March 1853 Claudet patented a *folding pocket stereoscope* and in 1855 he patented a stereoscope with adjustible tubes to suit different eye widths. This patent also covered the invention of a *large revolving stereoscope* where 100 stereoscopic slides could be rotated on a band. Claudet's fascination with three-dimensional reality continued throughout his life and for many years he worked on combining the stereoscope with the *zoetrope* to create *'moving photographic figures'* providing an important step towards the creation of moving pictures. In April 1858, at the Royal Society, Claudet presented his *stereomonoscope* where two stereo pictures could be brought together in one image enabling several people to view the pictures on a large screen.

In 1865 Claudet was made the *Chevalier de la Legion d'honneur*.

Towards the end of his life Claudet worked with John Henry Dallmayer on differential focusing and was also involved in producing *Photosculptures*.

Even late in life Claudet was an ardent promoter of photography, a focused scientist and artist and valued Photography as a fine art. He wrote that being a photographer:

> …requires thought, taste, judgement and refinement, to use with success the apparatus and the process, I consider that there is as much art in the result as in any of the so-called 3fine arts… *The Photographic Journal* August 1861

Claudet died in 1867. Sadly a year after his death there was a huge fire at his studio, which destroyed around 20.000 negatives, daguerreotypes and prints.

In August 1868, Basil Montague Pickering wrote 'A. Claudet FRS-A Memoir'.

LAURA CLAUDET

Biography

Born at the Chateau de Rosay, Lyon, France in 1797. Claudet moved to Paris to work as a banker in 1818 and then to England in1827, to import glass. Established manufacturing and wholesale company of glass *'Claudet and Houghton'* in 1834. Visited Daguerre in Paris and bought a licence to practice Daguerreotype Photography in 1839. 'Claudet and Houghton' sold photographs and photographic equipment in their shop in 1840. In the same year Claudet took some of the first photos of London. Opened daguerreotype portrait studio, *'The Adelaide Gallery'* in 1841. In the same year, Claudet read his *'Acceleration'* paper to the *Academie des Sciences*, discussing his process which reduced exposure times and Beard brought out court injunction against Claudet which was dismissed. Claudet also patented painted backgrounds, artificial lighting and the use of the red light in the dark room. Invented the photographometer in 1848. Invented the dynactometer in 1850. Opened 'Temple of photography' studio and exhibited daguerreotypes and stereo daguerreotypes at the Great Exhibition in 1851. In 1853 was made 'Photographer in Ordinary' to Queen Victoria, became member of the *Royal Society of London for the Advancement of Science* and *patented the folding pocket stereoscope and the stereoscope with adjustable tubes*. Patented the revolving stereoscope in 1855. Presented the stereomonoscope to the Royal Society in 1858. Delivered *lecture 'On Photography in its Relations to the Fine Arts'* at the Photographic Society of Scotland in 1860. Made *Chevalier de la Legion d'honneur* in France in 1865. Died in 1867.

Selected Works

Individual Exhibitions

1844, Palais de l'Industrie, Paris,(F).
1847, John Scott Russell's Industrial Exhibition, the Society of Arts (GB).
1851, Great Exhibition, The Crystal Palace, London (GB).
1855, Amsterdam Photographic exhibition, Received 'Tentoonstelling van photographie' prize.
1855, Exposition Universelle, Paris, First Class Medal.
1856, Photographic exhibition, Brussels.
1859, Exposition S.F.P.,Paris (F).
1861, Exposition S.F.P., Paris (F).
1861, Birmingham exhibition.
1862, London International exhibition (on Jury).
1863, London photographic exhibition.
1865, Dublin International exhibition (on Jury).

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CLAUDET, FRANCIS GEORGE (1837–1906)

Canadian photographer

Francis George Claudet, the youngest son of photographer-inventor Antoine Francois-Jean Claudet, was born

on February 15, 1837, in London, England. Assumed to have received his photographic education from his father, Francis studied mining and metallurgy in London and Germany from the mid to late 1850s in preparation for his career as an assayer. In 1859 the Master of the Royal Mint appointed him the Assayer for the Colony of British Columbia, Canada. Due to the cost, Claudet's photographic equipment followed him to British Columbia, which he reached on February 10, 1860. While awaiting the completion of his work buildings and living quarters in New Westminster, he lived in Victoria (Colony of Vancouver Island) and traveled to various points in both colonies, partly on board HMS *Satellite*, the vessel on which Lieutenant Richard Roche served. After Claudet received his photographic kit by the end of summer 1860, he busied himself, in his spare time, with taking photographs of New Westminster and its residents, as well as various points he visited on official duties. He knew other professional photographers, including Frederick Dally (Victoria), David Withrow (New Westminster and Moodyville), and possibly Richard and Hannah Maynard, who were on the same crowded vessel Claudet took back from San Francisco in 1862 when he purchased coin-minting equipment. Claudet competed with George Robinson Fardon at the London International Exhibition (1862). At least two of Claudet's photographs were used for engravings published in the *Illustrated London News* (May 12, 1866). Claudet worked in a variety of other civil service and judicial capacities until he was laid off in January 1873. He returned to England with his family, bitterly disappointed at his treatment after 13 years service. He continued to work in the assay business, but does not appear to have pursued his interest in photography. He died in London, England, on March 13, 1906. Although Claudet's wet plate negatives have not been located, family papers, including photograph albums, were purchased by the British Columbia Archives in 1946 from a son who had returned to settle in the province. The University of British Columbia Library also preserves a number of Francis George Claudet photographs.

DAVID MATTISON

CLICHÉ-VERRE

Essentially a hybrid of printmaking and photography, cliché verre technique uses neither ink nor camera to produce, through photographic chemistry, hand-drawn or composed images on paper. The process involves two basic steps. First, a transparent glass plate (or other transparent surface) is coated with an opaque substance such as collodion, ink dusted with powdered white lead or an oil-based pigment. Using a sharp instrument, the artist draws a design into this matrix. The plate, which acts as a hand-drawn negative, is placed into contact

Carot, Jean Baptiste Camille. L'Embuscade.
The Metropolitan Museum of Art, Purchase, The Horace W. Goldsmith Foundation Gift, 1991 (1991.1072) Image © The Metropolitan Museum of Art.

with a light sensitive sheet of paper and exposed to light, which passes through the drawn areas of the glass plate but is absorbed by the opaque areas. The paper, darkening in proportion to the amount of light received, forms a positive, laterally reversed print. The print is then washed, fixed, and dried. Modern cliché-verre are often made using transparent plastic or film, rather than glass. Nineteenth-century cliché-verres, usually made with either salted or albumen paper, generally exhibit light brown tones while twentieth-century prints can exhibit a range of tones and colors. Cliché-verre ("glass negative") is the most common term for the process. Other terms include *cliché-glace, dessin héliographique, autographie photographique,* photogenic etching, etching on glass, autograph etching, and glass print.

The cliché-verre process was introduced to the public in 1839 by three English artists, James Tibbits Willmore, William Havell and his brother James Frederick Havell. Experienced printmakers, the trio was inspired by William Henry Fox Talbot's experiments with the cameraless "photogenic drawing" process in which objects or designs were placed in direct contact with a sensitized paper and exposed to light to produce a negative image. In March 1839, two months after Talbot gave his report

on his photogenic drawing process to the Royal Society, Willmore and the Havell brothers exhibited cliché-verre prints at the Royal Society in London. Their prints were made by covering a sheet of glass with etching ground and smoking it to create an opaque surface. Using a sharp instrument, they drew designs into the opaque ground, placed the glass in contact with light-sensitive paper (made using Talbot's salted paper process) and exposed it to light to produce a positive print. Countering Talbot's protestation of prior invention, Havell stressed that unlike Talbot's process, which sought to faithfully reproduce the external world, the aim of the cliché-verre was "to delineate the work of the artist's pencil by the Photographic process" (Glassman and Symes, 1980).

By 1841, the cliché-verre technique had been included in two technical manuals: Robert Hunt's *A Popular Treatise on the Art of Photography,* and T.H. Fielding's *The Art of Engraving.* Though none of the earliest cliché-verres appear to have survived, a print by the English. A fairly simple reproductive process that required neither the manual skill of engraving nor the complicated equipment of etching, the cliché-verre process was nevertheless used only intermittently in the 1840s and few cliché-verre from this period are extant. The development of cliché verre as a significant artistic practice did not occur until 1853, when the medium was independently discovered by the amateur photographer Adalbert Cuvelier, in collaboration with Léandre Grandguillaume, a professor of drawing in Arras, in northeast France. Together, they introduced the cliché-verre process to the circle of artists living and working in Arras in the 1850s and 1860s that included the landscape painter and lithographer Constant Dutilleux, lithographer and photographer Charles Desavary, photographer Eugène Cuvelier (son of Adalbert), and, most notably, the painter Camille Corot, who would eventually produce over 65 clichés-verres that ranged from rapid, bold sketches to more monumental, fully worked compositions.

The period from the early 1850s through the 1870s was the golden age of cliché-verre in France. Along with Corot, a number of artists working in and near the town Barbizon adopted the technique, including Théodore Rousseau, Charles Daubigny, Charles Jaque, François Millet, Paul Huet and others. Sometimes the process involved collaboration between photographers who prepared the plate and made the print and painters who drew the design. The most common subjects of nineteenth-century cliché-verre prints are landscape and rural motifs; as in the case of Corot, cliché-verres sometimes functioned as studies for a larger painting.

During this fruitful period, artists expanded both the range and vocabulary of cliché-verre technique in a number of ways. While the glass plate was most often coated with collodion to make it opaque, other techniques included covering the glass with printer's ink dusted with white lead powder or with an oil-based pigment which could be applied onto the plate in varying thickness to allow for a more subtle modulation of tone and transparency. Other modifications of the process included placing the emulsion side of the sensitized sheet onto the bare (unworked) side of glass, rather than directly onto the hand-drawn surface, before exposure to light. Because the light traveling through the glass is refracted before reaching the sensitized paper, it creates an effect of halation and produces a softer, less linear print. Another technique for creating a softer, more impressionistic image involved interposing a second plate of glass between the hand-drawn glass negative and the sensitized paper. The surface of the print could also be given a dotted or patterned texture by using a roulette wheel (a toothed wheel used in etching) or lightly tapping the coated plate with a steel brush or other instrument. Although cliché-verre prints were most often made on either salted or albumenized paper, some nineteenth-century artists employed the cyanotype, gelatin silver or other processes. Varnishing and toning cliché-verre prints was not uncommon.

Although never a widely popular technique, the cliché-verre has continued to interest artists and viewers. In 1921, the Parisian publisher and art dealer Maurice Le Garrec published *Quarante Clichés-Glace,* a portfolio of reprints of cliché-verre plates by Corot, Millet, Rousseau, Daubigny, and Delacroix. Among twentieth-century artists who have explored the technique, mostly using gelatin-silver paper, are Picasso, Brassaï, Max Ernst, Paul Klee, Man Ray, and Frederick Sommer. Artists continue to make clichés-verre prints today, and have greatly expanded the medium's technical and artistic range by using a variety of supports, including glass and plastic-based films, as well as by experimenting with different photographic processes, such as dye transfer to make color.

Sarah Kennel

See Also: Wet Collodion Negative; Corot, Jean Baptiste Camille; Cuvelier, Eugène and Adalbert C.; Dutilleux, Constant; and Talbot, William Henry Fox.

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CLIFFORD, CHARLES (1819–1863)

Although he was British-born in South Wales, Charles Clifford became one of the finest photographers in Spain. His work combined the highest technical standards with a sympathetic eye towards the architecture of Spain.

Little if known of Clifford before he arrived in Spain in 1850, although it is apparent that he was already skilled in photography. Several accounts of his life suggest that he went to Spain to work as a balloon pilot—or 'aeronaut of aerostatic balloons' as one source describes him. And shortly after arriving in Spain he is believed to have attempted to make daguerreotype aerial views from a balloon, together with the French lithographer Alfred Guesdon. The success or otherwise of this venture is unclear, as none of these experimental images is known to have survived.

However, it is his work after 1852, when he moved to Madrid, which marks him out as one of the country's finest photographers. Working with calotype, waxed paper, and wet collodion, he produced an enormous output within a relatively few years, exhibiting and publishing widely. His control of light and space marked his work out as exceptional, although he was less concerned with architectural and geometric accuracy than many of his contemporaries. Working with a very direct and visually engaging style, much of his work—especially those images of the regeneration and modernisation of Madrid has a surprisingly fresh documentary feel to it.

Portfolios such as his 1856 *Vistas del Capricho,* containing fifty five views of the 15th century palace at Guadalahara and the 18th century summer house of the Dukes of Infantado at Capricho were well received. *Voyages en Espagne* (Journeys through Spain) produced in the same year, contained four hundred large format (35cm × 45cm) images, and was widely acclaimed when exhibited in Paris. A project on this scale would, of course, have taken some considerable time to complete. Some of the photographs which would eventually form part of *Voyages en Espagne* were displayed at a meeting of the Photographic Society in London in April 1854. Having progressed from calotype to le Gray's Waxed Paper process, these images portrayed the great churches, palace, monuments and landscape of Spain. Gernsheim suggests that Clifford was working towards a much wider publication of *Voyages en Espagne* but that his death in early 1863 brought the project to a halt.

In Spain the calibre of his work was recognised at government level, and resulted in several important civic commissions. Thus, from 1856 he photographed many of the city improvement projects in Madrid.

Clifford's photographs of the construction between, 1856 and 1859, of Queen Isabella's canal and aquaduct system to bring fresh water to Madrid are fascinating and important historical documents. Images showing the apparent chaos of the construction site for the *Pontón de la Oliva*, reservoir-dam, and the long snaking route of the *Sifón del Gualix,* contrast vividly with the stark simplicity of his views of the partially completed tall arches which would eventually carry one of the major aquaducts into Madrid. A significant number of fine salted paper prints from collodion negatives survive from this project.

Clifford's photographs brought him to the attention of Queen Isabella II, who was known to give albums of his architectural and landscape photography to visiting heads of state, and in September 1860 he accompanied her and her entourage on a journey to eastern Spain and the Balearics, arriving back in October. The albums of images which he produced on his return revealed all the places they had visited en route. By this time he was using collodion glass plates and printing on albumen paper.

On November 14th 1861, at Windsor Castle, Clifford made an exceptionally fine portrait of Queen Victoria, dressed in a long evening dress and wearing a coronet. The portrait was well received, and critics in Britain praised it for the regal quality it gave to the Queen, in sharp contrast to the rather less formal views of her and her family which were being published at the time by Mayall and others.

Historians disagree about the genesis of this royal 'sitting,' and indeed about Clifford's relationship with both the Spanish and British monarchs. It has long been held that the idea for the portrait was instigated by Queen Isabella, with several sources claiming that she sent Clifford to Windsor to take the picture. Those same sources claim that Clifford enjoyed some sort of official status as court photographer to Isabella. Others suggest that the portrait was at the request of Queen Victoria. Further research on this is clearly needed.

It would, however, appear that both Clifford and Juan Laurent did enjoy significant royal patronage from Isabella, and the selection of Clifford to accompany the Queen on two of her journeys suggests that he was, indeed, a favourite. Henisch & Henisch (1994) remark that "Isabella was an unhappy woman and an incompetent queen, but she was blessed with one stroke of good fortune: the inspiration to appoint Charles Clifford. No one could have been better fitted than he for the unenviable

task of creating an image of dignity and progress from the disorder and corruption of her reign."

The resulting portraits, whoever instigated them, were published widely. They were available in large print format (275mm × 215mm) and as *carte-de-visite*. Two versions of the carte-de-visite are in the collection of London's National Portrait Gallery, one published by Clifford himself, the other, hand tinted, published by Cundall and Downes.

Clifford's work featured in several exhibitions of the Société française de photographie—of which he was a member—while he only contributed work to the 1854 exhibition of the Photographic Society in London. He offered forty-six images for sale in the 1858 exhibition of the Architectural Photographers Association in London—four shillings and nine pence un-mounted, five shillings and sixpence mounted.

After his death in early 1863, and in the face of stiff commercial competition, his wife Jane attempted for a time to keep the business operating.

John Hannavy

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COBURN, ALVIN LANGDON (1882–1966)

American photographer

Alvin Langdon Coburn was born in Boston on June 11, 1882. He was given his first camera, a 4" × 5" Kodak, on his eighth birthday. Coburn's interest in photography was further nourished by his distant cousin F. Holland Day, who in 1899 encouraged the young Coburn and his mother to travel to London. While in England, Coburn had his work exhibited at the Royal Photographic Society and with the Linked Ring. In 1902, he opened a studio in New York City and became a member of the Photo-Secession.

Coburn moved back to England in 1904 and took classes in the photogravure process in 1906, and in 1909 used his own copperplate press to print his photographs which were published in his books *London* (1909), *New York* (1910), and *Men of Mark* (1913). Coburn was a champion of photography as an art form and helped to organize exhibitions of contemporary photographers along side the prints he made from Julia Margaret Cameron's and Hill & Adamson's original negatives. In 1916–17 Coburn created abstract prismatic portraits which the poet Ezra Pound named Vortographs. After 1923 Coburn showed less interest in the art of photography and devoted his time to mysticism. He was residing in Wales when he died on November 23, 1966.

Diane E. Forsberg

COLE, HENRY SIR (1808–1882)

Henry Cole was born in Bath, England, on 15 July 1808 to Laetitia (née Dormer) and Captain Henry Robert Cole, an army officer. Educated at Christ's Hospital School, London, in 1823 he gained employment as a civil servant, embarking on what was to be a highly influential career in public service and more specifically, in the world of art education and museums. Cole chiefly organized the Great Exhibition of 1851, which introduced an unprecedented gathering of European and American photographs to huge audiences, and, under his supervision, was itself photographically documented. In 1856 Cole became the founding Director of the South Kensington (later Victoria and Albert) Museum where he worked until 1873. An amateur photographer Cole, was a pioneer in the appreciation of photography. He collected for the museum photographs both *of* and *as* art and purchased and exhibited work by radical contemporary photographers, such as Julia Margaret Cameron (1815–1879). He also established the museum's photographic service for copying works of art for educational purposes, and enabled Royal Engineers to be trained in photography by the museum's first staff photographer Charles Thurston Thompson (1816–1868). No other museum in the world did so much for photography or collected so well at this time. Knighted in 1875, Sir Henry Cole died in London on 18 April 1882.

Anne-Marie Eze

COLLARD, AUGUSTE-HIPPOLYTE (1812–c. 1897)

French photographer

Auguste-Hippolyte Collard was born in Valençay, Indre, France, on February 1, 1812. After marrying in Paris in 1838, he settled in Poitiers. There, for 10 years, he prospered as a wood frame gilder. The year 1850 marked a turn in his career, henceforth dedicated to photography.

Helped by his two younger brothers Jules and Victor Brutus, he set up his own workshop in Paris in 1855 and created in 1856 the "Collard and Cie" company—which went bankrupt two years later. He produced numerous portraits, and built up a reputation in the reproduction of works of art. Today most of these prints have disappeared.

Towards the end of the 1850s, mostly through commissions, he began using photography for civil engi-

neering applications. His most important patron was the Ministry of Agriculture, Commerce, and Public Works. With Edouard Baldus, by commission of the Emperor, he also documented the expansion of the railroad in France. A first album (1857), dedicated to the re-building of the Pont St Michel, marked the beginning of a 25-year-long collaboration with the 'Administration des Ponts et Chaussées,' the last outcome of which is an illustrated report on the reservoir of Noisel (1885). The process and outcomes of architectural construction have by then become the focus of the 'Atelier Collard.' Its prints span the major urban upheavals of these times, throughout the territory and not the least in Paris.

Always conscious of the quality of his prints, displayed notably at the universal exhibitions, Collard designed in 1860 a proprietary solution known as "bain de virage (toning bath) Collard."

Luce Lebart

COLLECTORS

If twentieth-century collectors of photographs are just recently becoming well known, then those of the previous period were mostly unknown. A very few studies have been conducted in the domain of 19th century collectors and photographic market. This gap can also be explained by the fact that the idea of a large disinterest for old photography, which marked the first half of the 20th century, and has been extended to the second part of the 19th century. However, everything indicates that many people during this period were able to distinguish between photographic prints of a work of art, a document, an industrial production or a scientific archive.

To study this complex topic, one must not only ask who collected photography, but also which types of images were collected and where one could find photography. The advancement of the history of photography and the studies of contemporary documents illuminated the first clues which established the parameters for this type of research.

The figure of collector has changed throughout time and in accordance with the type of objects collected. Photography is one of the subjects which considerably changed the traditional ideal of the collector. Since the beginning of photography collecting images was made possible because it was democratic, available, and easy to archive. Photography also produced collectors of various types who were more diversified than before. If the first collectors were aristocrats and rich bourgeois, at the end of the century, then a new type of collector appeared. The average man in the street became a collector too. This new medium had begun to democratised the collector as art enthusiast.

Since the end of the 1830s, the art market was in full expansion. It extended rapidly and the number of collectors in general increased constantly with the rise of middle class. Galleries opened and showed various exhibitions as the Beaux-Arts Salon did. The engraving market was particularly flourishing and the dealer as the collector became an emblematic figure of the art world. At the same time, linked to the engraving market, a photographic market began to appear. Photographic prints could be found in traditional places for engraving amateurs: book shops, shops of engravings and drawings, but also in studios and shops of photographers, in editor's places (Colnaghi in London, Gide & Baudry, Gosselin, Pellion, Legoupy in Paris), paper-makers, camera manufacturer places (Susse and Giroux in Paris) and in auction rooms.

This context shows that during this period there existed several kinds of collectors: princes and princesses, aristocrats, artists, architects, industrialists, rich amateurs of art and tourists, but also public institutions, museums, libraries and schools dedicated to art and science education. Those institutional collections were held by curators and the collection itself was related to the public institution's history and policy, to the state's will. Several academic collections were established in universities and libraries throughout Europe. In the United States, the Library of Congress was established in Washington, D.C. The collection started in 1870, contains photographs of Fenton and 12 millions of photographs of the country's history. The Victoria and Albert Museum (VAM), the Bibliothèque Nationale de France (BNF) and the Institut de France have all been collecting since 1850, which thanks to the "dépôt légal" and the royal sponsor, consists of a large number of prints of all kind from landscapes, to portraits and official patrimonial missions like Mission heliographic in 1851, commissioned by the young Commission of historical monument. The Société française de photographie (SFP) and the Photographic Society of London both pioneered the collection of photographs and specifically stated that the assembly of the collection was a part of their raison d'etre.

However, the focus rather was put on private collections, because as collectors are defined in the Pierre Larousse, *Grand dictionnaire universel du XIX^{e} siècle,* "they are those jumble sales apostles, who had learned the state of forming archives, museums, deposits of all kinds." At first, an outline on the emergence of the photograph collectors appeared, and was followed by the various types of collectors there could be.

In France, the organisation of photography auction sales is not well known, but several elements indicate that a photograph market did exist. Helène Bocart's studies of the SFP exhibitions in the 19th century and the examination of contemporary art magazines give partial answers. The first photographic sale known in Paris was organised in 1857 by the SFP, from its

collection, in order to solve financial problems. The sale took place in June 5th 1857 at the Drouot's hotel, the exhibition of the prints was the day before and it counted 58 names. A public noticeboard announced "Sale of photographs. Prints of amateurs and artists." The 1857 sale was successful, several photographs exceeded the double of their initial price, which was the first time in photographic history. In the *Revue photographique* of July 5th 1857 one can find an interesting commentary about collectors :

> "The ones [photographs] which had reached exceptional value were perfect in every respect, and it has been demonstrated then, that collectors taste was already formed, which we were far from expecting. […] A reproduction of Leonard de Vinci *Cene*, by M. Sacchi, even if it was still not up to the mark, has been pushed up to 125 francs."

The 1857 SFP sale indicates then that at this time there were a certain number of photographs collectors, certainly since the paper process expansion, whose tastes were already formed, which assumes the existence of a photographic market more or less officially since 1855, out of which the critic emerges as a new phenomenon. Photography on paper certainly attracted more people than the daguerreotype which was unique and difficult to look at. The 1850s were also the golden age of calotype during which, following the example of painting, photography required schools.

This new situation was confirmed during the second sale of the SFP on May 18 and 19, 1858. It was announced in the journal *Cosmos* in December 1857 and took place in the Drouot Hotel in Paris. 441 photographs were sold, 10 to 20 per photographers amongst whom one could mention Olympe Aguado, Gustave Le Gray, Camille Silvy, Mailand, Paul Gaillard, Pierre Richebourg, Alphonse Davanne and Paul Perier. A commentary by Robert de Lasteyrie in the journal *Le Siècle* in June 25th 1858 indicated the increased numbers of collectors interested in photography:

> "Each year, we make a sale of it. […] the preceding exhibition, unfortunately too short, had attracted a lot of [the] curious. The sale itself had proved that the number of true amateurs, [and] collectors of photographs, had regularly increased amongst us, and that their taste is developing more each day. Such pieces that one finds in every dealer at 5 francs are sold 25, 30 and up to 40 francs. Isn't it the best evidence that, in a beautiful photograph, there are some very artistic qualities, which can't escape to the connoisseur eye? The only work doesn't produce such differences in the results."

This second success confirmed the cause of photographic art and the concept of the collector with a high degree of knowledge of photography. Two other sales were organised during this period, the first in Brussels, from August 15th to October 31st, 1857, and the second in Amsterdam in 1858. As underlined by Robert de Laysterie, the development of the collector's taste was directly linked to the emergence of photographic schools.

> "Little by little schools are formed and are distinguished, thus, right now, the slightest trained amateur eye will recognise without pain the English or Italian photographs from those made in France."

What gave to the 1858 sale a particular appeal, was that it gathered a great number of works by foreign amateurs and artists which couldn't be found in the shops. The striking matter of fact, according to Robert de Lasteyrie, was the "discernment, the uncluttered taste of the public buyer." Most of the big monumental plates of Baldus and Bisson sold for twice their price. Landscapes were largely represented in this sale, and "the public seems to have keenly tasted their work." The portraits were less appreciated, while reproductions of works of art had stronger success. The buyers were mainly photographers and collectors like Adolphe Moreau, Dupuy Montbrun and Hulot. The average print price was between 2 and 6 francs (6 and 12 euros today).

This context seemed to be the same in England. As underlined by Mark Haworth-Booth, the fact that the 1858 exhibitions of the Photographic Society of London were staged and opened by Queen Victoria and Prince Albert indicates that photography "had gained a fashionability year by year during the 1850s. Photographs were not only exhibited in important art context but acquired by collectors."

This fashionability first influenced princes and princesses of European courts who encouraged, bought and commissioned photographs. Napoleon III in France, Victoria and Albert in England, Pedro II in Brasilia, were important collectors of photographs as well. The Napoleon III collection was shown in an exhibition at the Bibliothèque nationale de France in Paris in 2004, under Sylvie Aubenas direction. The collection consisted of various major works containing historical themes, and were presented in luxuriously bound albums, that came from the libraries of the state residencies. Those images had originally come from public commissions, photographic campaigns encouraged by Napoleon III or by his ministries, or as gifts made to the prince with the hope of attracting his favour and some subsidy. Far from trying to support this new art, seen above all as a technical progress, the prince's ambition was to constitute, by the means of photography, a "historical gallery of the reign." The veracity of the photographic image, with the modernity that it symbolised, made it the ideal auxiliary of the reign great realisation.

The Victoria and Albert collection was also exhibited within an exhibition and a catalogue in 1998, *The Museum and the Photograph. Collecting Photography at the*

Victoria and Albert Museum, 1853–1900, at the Sterling and Francine Clark Art Institute. It is preserved in the Windsor castle and counts 25,000 prints. Since 1842, the Queen had inaugurated the accumulation of private souvenirs of family photographs, such as her trips and the outstanding events of her reign (1837–1901). The queen's interest for photography was more personal, and precocious and followed than Napoleon III's. Her husband, Prince Albert, had the same taste for the new medium: he became member of the Royal Photographic Society and collected Le Gray marines and numerous reproductions of works of art.

A comparison can be made with Pedro II, Brazil's emperor from 1831 to 1889. Like Queen Victoria, the emperor had acquired since 1840, at the age of fourteen, a daguerreotype camera. His collection, mostly protected, is preserved to the Print Department of the National Library of Rio of Janeiro. By its nature, it is situated between Napoleon III's and Victoria's. One can find albums commissioned by Pedro II on Brazil major themes, scientific albums in particular ethnographic, some other offered by European commercial companies as advertisement, family portraits, celebrities in visit, and travel and exploration albums on Egypt, Italy, Persia, France, Madagascar. Pedro II, who didn't leave his country until 1871, when he was 45, largely took knowledge of the world through the photographic prism. Moreover, by commissioning adventurous photographers and businessmen installed in his country, he gave to Brazilian photography an unexpected importance.

Those princely collections are certainly the most important ones of that period, containing various subjects. The princely figure as aesthete and art protector invited the others to follow this model. Aristocrats, rich amateurs but also architects and artists bought photographs for aesthetic and documentary interest. In France, Duke of Aumale, Dollfus-Ausset (industrialist), Ignace Chauffour and Alfred Bruyas can be taken as example to show the diversity, the taste and the destination of their collections.

In 1886, Henri d'Orléans, duke of Aumale (1822–1897), fifth son of king Louis-Philippe, gave the Chantilly castle and collections he had gathered therein to the France Institute. Known for his very important paintings collection (Raphaël, Poussin, Watteau, Ingres, Delacroix…) and painted manuscripts dating back to the middle age, the castle also preserves an important collection of old photographs. This collection counts almost 1.400 photographs from the second part of the 19th Century. Firstly, photography was a means for the prince, who lived exiled in Britain from 1848 to 1871, then from 1886 to 1889, to see places he had known or lived during his youth and where he couldn't go anymore. For instance, the Louvre and Tuileries, photographed by Baldus and Bisson brothers, and more generally, Napoleon III Paris then in transformation. His collection also contains family portraits, views of his castle and reportage on the Crimean War. But the other purchases can only be explained by a real taste of the prince for the new art that photography constituted. The collection is composed of all the photographic movements from 1855 to 1897, except Pictorialism. For instance, he bought views of Great Eastern by Howlett, five marines by Le Gray, some views of Switzerland by Adolphe Braun, purchases which can be explained like "love at first sight" buys. In 2001, an exhibition and a catalogue of this photographic collection had been set up in the Chantilly castle.

Daniel Dollfus-Ausset (Paris 1797–Riedisheim 1870) is an important collector figure, really out of common. A great textile industrialist in Mulhouse (Alsace, France), passionate by mountain, he ordered an important series of daguerreotypes of high mountain in 1849 and 1850. Looking for bigger images, he ordered a new series to the Bisson brothers. After the Bisson success with a big panorama of the Aar glacier, Dollfus-Ausset became their patron in 1855. But from that time on, he had already gathered an important photographic collection. In December 1856, the Society of Art friends of Strasbourg organized an exhibition of more than 250 photographs from the private collection of the Mulhousian industrialist. This contained lots of Bisson prints, made in Paris, landscapes and views of architecture from Heidelberg, Strasbourg and Basel. Other important photographs were presented: a *marine* of Gustave Le Gray, two countryside views and a portrait of the empress Eugenia by count Olympe Aguado, a view of Rome by Ferrier, flowers of Adolphe Braun, views of Pyrenees by count de Vigier, an *effect of water and sky* by Alphonse Giroux, a fountain by Edouard Baldus and an incunabulum of photography, the *Pencil of Nature* of Fox Talbot of 1844, publication illustrated by original calotypes. Unfortunately, it doesn't exist anymore.

A contemporary and without doubts a friend of his, Ignace Chauffour, an intellectual, member of Scientific society, member of the Martin Schongauer Society in Alsace, is one of the earliest photographs collectors. His curiosity for the new medium was precocious: he began to buy prints from the "second birth of photography," the expand of paper process. Ignace Chauffour collection counted almost 550 prints and proposed significant examples, beginning with a series of nine photographs by Henri Le Secq, a rare print on salt paper of François Renard (view of Notre-Dame of Paris), and views of Fortuné Joseph Petiot-Groffier, Edouard Baldus, Olympe Aguado, Bisson brothers. Ignoring the development of the Dollfus-Ausset collection after 1856, one can't maintain the comparison with the one of Chauffour, which continued with Adolphe Braun and James Anderson (ten views of Italian architecture.) But the most important part of Ignace Chauffour collection

is constituted by reproduction of works of art. Intending to build his own "imaginary museum," Chauffour gathered about 350 reproductions (representing 63% of his collection.) He bought photographs as well as engravings or lithographs reproductions. Photography was in this respect most of the time considered superior to the traditional graphic arts for the copy of works of art, because it was a difficult and delicate task. Some photographers like Robert Bingham for contemporary art and Adolphe Braun for old masters were the best in this domain and Chauffour, looking for quality, supplied to them. Thanks to the extraordinary fidelity to the original and the rapidity of execution, photography was attractive and stimulated appropriation instinct: one had the work of art under their eyes, one could possess it. With photographs of reproduction, Chauffour completed his fac-simile collection, aiming to create for him and in the spirit of the Schongauer Society, a true collection of reference. Chauffour became very early conscious of the importance of photography for art knowledge and diffusion. In 1879, he bequeathed his photographic collection to Colmar museum that he dedicated to art education. The Dollfus-Ausset and Chauffour collections clearly assume the capacity of both to approach photography as a proper artistic medium, above all the only technical curiosity or the documentary interest.

Another kind of collector, free from any consideration, was the art amateur. Alfred Bruyas (1821–1877) from Montpellier, a rich art collector of contemporary paintings (Courbet, Delacroix, Millet, Ingres…), collected photographs for his pleasure and his documentation. Travelling in Rome in 1848, he brought back six daguerreotypes by Eugene Constant and three calotypes by Flachéron that he included in the catalogue of his collection edited in 1851. This catalogue also mentioned an album reproducing his gallery counting 35 paintings and drawings. Bruyas largely commented this album, encouraging photographic progress notably for the reproduction of works of art which were for him synonym to education, truth and modernity. But unhappily his photographic collection disappeared. The Fabre museum only preserves his photographic portraits by Disderi, Mayer & Pierson, Cairol, d'Albenas and Baldus.

From 1870 and 1880, the progress of the photomechanical process gave the possibility of mass producing images of quality at low cost. Framed more or less luxuriously, the images published by the firm Goupil & Cie for instance were above all destined to decorate the middle-class home walls or more modest classes. It did exist folding screen-frames used to put photographs, one hangs on the wall a photography frame as a painting, as well as family albums began to decorate the living-room.

All these elements confirm the importance of art photography and photographs collectors during the second part of the 19th Century. They deserve to be taken into account now, to go further in for a better knowledge of history of collectionism and a fairly approach of photography history.

Laure Boyer

See Also: Bibliothèque Nationale; Société Française de Photographie; Calotype and Talbotype; Aguado de las Marismas, Comte Olympe-Clemente-Alexandre-Auguste and Vico; Le Gray Gustave; Silvy, Camille; Napoleon III, Emperor; Victoria, Queen and Albert, Prince Consort; Painters and Photography; Pictorialism; Bisson, Louis-Auguste and Auguste-Rosalie; Le Secq, Henri (Jean-Louis Henri Le Secq des Tournelles); Flachéron, Count Frédéric A.; and Goupil & Cie.

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COLLEN, HENRY (1800–1879)

Henry Collen was a painter of miniatures who later became the first professional calotypist. He trained under Sir George Hayter and was a Royal Academy Silver Medal winner in 1821. Collen became interested in photography in 1841 and in August of that year obtained a license from Talbot to practice calotype portraiture commercially. He enjoyed some success although his technical skills were limited and he complained of a lack of support from Talbot. Despite the problems, relations with Talbot remained cordial. When his studio closed in August 1844 he had produced around a thousand portraits. Collen's artistic training influenced his photography. He criticised Talbot's use of light and backgrounds and extensively retouched his portraits. Collen's photographic interests extended beyond simple portraiture. In 1840 he was involved in experiments to

electrotype daguerreotype plates, in 1841 he made portraits for Charles Wheatstone's stereoscope and in 1842 put photography to practical use by making calotype copies of part of the Treaty of Nanking. He considered the possibility of exploiting Herschel's glass negative process and in the 1860's proposed a system of colour photography. The collections at the National Museum of Photography, Bradford and George Eastman House include examples of Collen's work.

JOHN WARD

COLLIE, WILLIAM (1810–1896)

Scottish photographer, worked in Jersey, Channel Islands

William Collie was born in Skene, Aberdeenshire, Scotland in October 1810 and like many other early photographers, started his professional life as a portrait painter. He moved south and is recorded as living at St. Helier on Jersey in the Channel Islands before 1841, where he had a portrait business. He became one of the earliest photographers working in the Channel Isles, operating from Belmont House, St. Helier until 1872. Another photographer (J. Collie) is recorded at the same address between 1861–64, this was probably his wife or other relation.

Collie was not merely a provincial studio portrait photographer. In the late 1840s he made a series of genre calotype portraits depicting "French and Jersey Marketwomen" which were well received by the photography critic of the Art Union (June 1, 1847), who compared them to the work of David Octavius Hill (1802–1870). The studies were later exhibited at the London Great Exhibition of 1851.

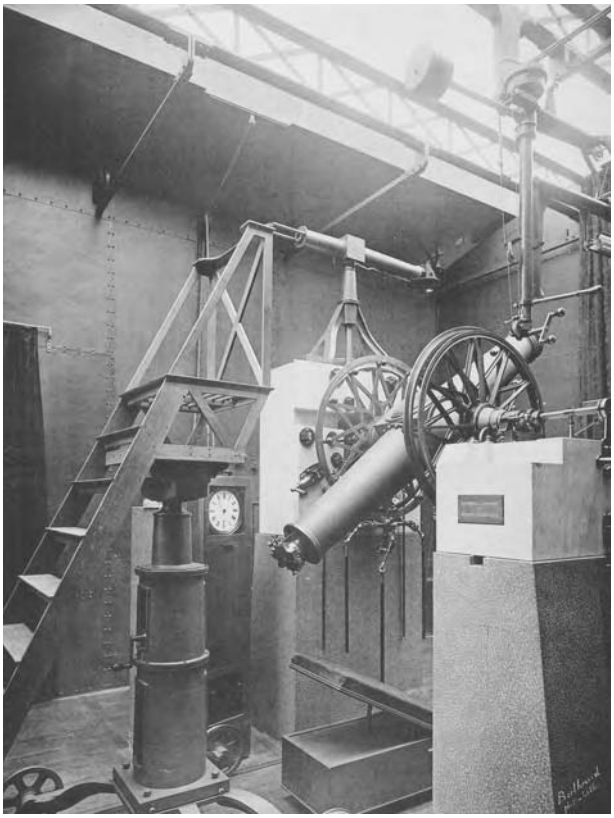
In 1860 Collie is known to have made a photograph of the total eclipse of the sun, which occurred on July 18th.

The Société Jersaise has a collection of his work, as does the National Museum of Photography Film and Television, Bradford, England.

IAN SUMNER

COLLOTYPE

Not to be confused with calotype, this dichromated colloid process uses the tanning effect of light on dichromated gelatin, whereby the hardened parts retain greasy ink that can be transferred onto paper, porcelain, or a variety of other supports. This planographic process was invented by Alphonse Poitevin (1819–1882) in 1855 (Fr. Pat. 24,592, Aug. 27; the Engl. Pat. 2,816 of Dec. 13, 1855 is not as complete) and can be considered the first practical process of photolithography.



Berthaud, Michel. Observatoire de Paris. Cours d'Astronomie. Ecole Polytechnique. Portefeuille des eleves. Cercle Meridien. Collimateur zenithal. Diametre de l'Objectif 0m. 19. Distance focale 2m. 325 (donne par Mr. Bishoccsheim).
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

Poitevin's original invention made use of a light-sensitive emulsion that consisted of a mixture of colloids such as albumin, gelatin, gum arabic, etc., coated on the surface of a regular lithographic stone. After exposure, the resulting matrix was washed with cold water and printed much the same way as an ordinary lithographic stone. On October 27, 1857, Poitevin sold his French and foreign patents to Deraine, who, the following day, sold them to Lemercier, the well-known Paris lithographer. Lemercier, who had been using a primitive form of photolithography, preferred Poitevin's process as it could provide up to 700 impressions from a stone. Poitevin was keeping five percent (5%) of all net profits between Aug. 27, 1863 and Aug. 27, 1870.

Once improved, this new technology was commercialized in France in 1857 by Lemercier and in 1860, by Ferdinand Joubert, under the name phototype. Although successful, the process was apparently seldom used but was revived in 1867 by MM. Tessié du Motay, and Maréchal (de Metz) under the name phototypie. Joseph Albert, of Munich, significantly improved the process in 1868 under the name Albertype. Albert's improvements

consisted of utilizing a glass plate as the base for the sensitized emulsion, instead of a stone, and also using an intermediary layer of hardened gelatin to support the gelatin matrix. It is interesting to note that early collotypes examined under a magnifying glass do not exhibit a reticulation pattern that is commonly seen in variants printed after ca. 1880. The reason for this was the introduction of accelerated drying in a stove which caused reticulation at the last moment of drying.

Jakob Husnik of Prague introduced a process very similar to Albert's and was bought out by the latter to reduce competition. The first Albertype to be made in America was produced by David Bachrach in the winter of 1868. The following year, Edward Bierstadt made his first Albertypes and exhibited them in January 1870. Autotype, of England, introduced collotype in 1872, although "Autotype reproduction" may also have meant this company's own use of the carbon transfer process which they were also exploiting at the time. Autotype was the largest English collotype operation by the late 1880s.

Collotype became very popular for the production of both, cheap quality postcards and high quality art reproductions. It gradually displaced woodburytype, although as the latter, it could not print text at the same time as a picture. One of the advantages of the collotype however was the ability to print an illustration on paper with any desired amount of white margin.

In 1873, Albert introduced the first rotary collotype press. In the early 1900s a combination of collotype and half-tone was introduced in the U.S.A. under the Aquatone trademark. This was later renamed Optak. About 1940, the offset press and gelatin coatings on thin, flexible metal sheets were adapted to collotype printing. The patent literature mentions improvements until at least the 1960s.

As of today, with the exception of screenless-lithography, aquatint photogravure and processes that use stochastic screening, collotype is still the only photomechanical process which uses a screenless matrix. High quality monochrome collotypes are practically indistinguishable from original photographs, especially if they are varnished, or if they have received a coat of gelatin (rare). The lack of a screen allows multiple impressions without the risk of moiré patterns. Collotype printing requires high skills and the nature of the matrix (reticulated dichromated gelatin) makes it suitable for only a limited number of impressions, e.g., 100 to 5,000. In England, ca. 1890, the most successful variations of the collotype were Autotype, heliotype, phototint and Humphrey's processes.

Fine colored collotypes can be seen in many books, including J.J. Tyler's "Wall Drawings and Monuments of El Kab: the Tomb of Paheri," 1895. Also, F. Rathbone's "Old Wedgwood, 1893–1898." One of the most impressive contemporary examples may be a facsimile reproduction of the illuminated manuscript "Le livre d'heures de Louis d'Orléans," Paris, Ed. Seefeld, ca. 1980, which used ten colors. Contemporary artists, like American photographer Todd Walker (1917–1998), have used collotype to print their work.

The last collotype plant in England, the Cotswold Collotype Company, closed in 1985.

The oldest and possibly the largest collotype plant, was Max Jaffé in Vienna, owned by Gerhard Habarta. It ceased operation in the 1990s. In America, a sister company, owned by Thomas Reardon, operated on a smaller scale under the name of The Arthur Jaffé Heliochrome Press, in Dalton, Massachusetts.

The premier collotype operation in the United States was Nicholas G. Jannes' Black Box Collotype, in Chicago, which had Michael Intrator as a technical director. Jannes, who was president of Black Box, donated the company's collotype presses to Arizona State University in 2001, under the condition that they remain in use.

There are about a half-dozen printing plants in the world producing collotypes today. Small operations are reported active in France (Item, Paris), Germany (Lichtdruck Kunst, Leipzig and Lichtdruck Werkstatt, Dresden), Italy (Fratelli Alinari, Florence), and in the former member countries of the USSR.

Among the many people who worked on the development of the collotype, we mention: Bolinetto, P.A. Despaquis (Engl. Pat. 3947, Nov. 17, 1874), E. Edwards (Engl. Pat. 3543, Dec. 8, 1869), Gemser, Geymet, Husnig, Jacobsen, Murray, Obernetter, Thiel, Van Monckhoven, Léon Vidal, Voigt, Waterhouse, F.R. Window (Engl. Pat. 3049, Oct. 19, 1869), etc.

The history of the invention of the collotype process and its variants are treated exhaustively in the brochure by August Albert, "Die verschiedenen Methoden des Lichtdruckes," 1900.

LUIS NADEAU

See Also: Autotype Fine Art Company; Half-tone Printing; Photolithography; Poitevin, Alphonse Louis; and Woodburytype, Woodburygravure.

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COLLS, LEBBEUS (active 1840–1860s)

Lebbeus Colls and his brother Richard were art dealers in London with premises at 168 New Bond Street. They commissioned work from many contemporary painters, including Samuel Palmer and John Linnell.

Colls became interested in photography before 1850, using Talbot's calotype process, and with his brother, exhibited 'sun pictures' at the 1851 Crystal Palace exhibition.

When Linnell expressed an enthusiasm for photography in spring 1852, Colls offered to sell him a 12 × 8 inch calotype camera, with lens and stand, and this transaction may mark Colls' transition from calotype to collodion.

He later sold his own photographs through his gallery, including several calotypes to Linnell. Prices ranged from 10/- to £1 per print. He also exchanged photographs with Linnell for sketches and paintings.

The Colls brothers photographed widely together, but while Richard exhibited collodion images in Glasgow in 1855, Lebbeus seems to have eschewed the exhibition circuit.

His subjects included landscapes, cloud and sunset studies, and locations in Chepstow, Raglan and Tintern, His view of Lynmouth in Devon, published in January 1857, was one of two which appeared in Paul Pretsch's *Photographic Art Treasures*. With two other images, 'Lynmouth' also appeared in *The Sunbeam*, published by Philip Delamotte in 1859.

Colls was still supplying photographs—'printed by Mr Cundall'—to Linnell in 1868.

JOHN HANNAVY

COLNAGHI, PAUL (1751–1833) AND DOMINIC (1790–1879)

The imprint of P & D Colnaghi is synonymous with the publishing and distribution of high quality photography from the mid 1850s. The company entered the photographic arena when they became the commercial distributors of Roger Fenton's images from the British Museum in 1854. In 1856, they became joint British publishers—along with Thomas Agnew of Manchester—of Fenton's images from the Crimean War.

The partnership with Agnew was an enduring one, as the two business co-published the five volume illustrated *Photographs of the Gems of the Art Treasures Exhibition, Manchester*, in 1857, with photographs by Caldesi and Montecchi.

Paul Colnaghi entered the employment of art dealer Anthony Torre 1783, eventually taking control of Torre's business. By developing strong relationship with artists, he ensured that the gallery exhibited the best of contemporary art. Paul was joined in the business by his son Dominic, and the name P & D Colnaghi was adopted.

In the 1850s, in addition to the Fenton material, Colnaghi published war artist William Simpson's works *The Campaign in the Crimea*, and in the 1860s, acquired exclusive commercial rights to market the photography of Julia Margaret Cameron.

The company withdrew from the photographic market at the outbreak of the First World War, returning to it in the mid-1970s.

JOHN HANNAVY

COLOR THEORY AND PRACTICE: 1800–1860

Color photography, both theory and practice, has a history as long as black and white photography, but one rather more full of disappointments. From the beginning of photography as an enterprise in 1839 with the publication of Daguerre's and Talbot's results, commentators noted color's absence and experimenters sought to invent a process for it. Richard Beard, the holder of the British rights to the Daguerreotype process wrote in 1843:

> "It was color that was wanting to crown all the other improvements and give perfection to the whole."

Sir John Herschel, perhaps the greatest physicist of his time, and a close friend of Fox Talbot's, famously gave Talbot his 1819 discovery of sodium thiosulfite as a solvent for unexposed silver halides to use as a photographic fixer in 1839. He then began immediately to experiment on Talbot's and other photochemistries, and by 1840 and for the next several years tried many experiments aimed at recording color. Some of these were reported to the Royal Society, while others were recorded only in his notebooks and in letters to Talbot. Herschel tried experiments with vegetable extracts, some of which gave quite beautiful and permanent colors, but like his well known invention based on iron salts, the

cyanotype (the "blueprint"), these were unrelated to the colors of the subjects. He also experimented repeatedly with silver chloride (see below). As shown below, until well after 1860 all such attempts by all experimenters failed to create a permanent color photographic process. The first hints of a direction for research, however, predate photography by 60 years.

In 1777 Carl Scheele published an account that showed that silver salts would darken most rapidly when exposed to the violet and blue parts of the spectrum, and that the blackened areas were due to the reduction of the silver salt to metallic silver. Jean Senebier shortly after, in 1782, published work that showed that it took red light 80 times longer to darken silver salts than violet light. He also noted a hint of color in the results for different parts of the spectrum, which foreshadowed Seebeck.

In 1800 Sir William Herschel (John's father), while studying the energy distribution in the solar spectrum, discovered significant heat energy beyond the red end of the spectrum, later christened the infrared. Spurred by this result, in 1801 Johann Ritter examined the violet end by exposing silver chloride ("hornsilber") to it and discovered energy beyond the violet, now called the ultraviolet. He too observed some hints of color at the blue end of his recording. (Wollaston independently discovered the ultraviolet shortly thereafter.) Both these results stimulated awareness of the energetic and chemical effects differences of different parts of the luminous spectrum and suggested a way of recording color.

Slightly later Johann Seebeck became interested in the problem and corresponded with J. W. Goethe who was then writing his well known book on the theory of color (*Zur Farbenlehre*), in which the results of Seebeck's experiments were published in 1810 and thereafter. Seebeck discovered that the solar spectrum, projected from a prism onto silver chloride sensitized paper (this was essentially Ritter's technique), gave rise to a rough copy of the color at most locations in the spectrum. Seebeck reported that in the violet he got red-brown; in the blue, blue, which spread into the green; he got black or yellowish in the yellow; and in the red a rose red or hortensia red. But these were of very unequal quality and could not be fixed. In a spectrum attributed to Seebeck in a private collection purple and violet currently remain visible, though weakly.

In 1839 Sir John Herschel was well aware of Seebeck's work with silver chloride and in addition to trying to use light to bleach out plant dyes he attempted to make direct positive images by exposing silver chloride on paper. By adjusting the concentration of his solutions, the dampness of the paper and exposure times, he achieved the following results on exposure to the colors of the solar spectrum in 1840: in the "deep red and mean red," no color; orange and orange-yellow, brick red; yellow, red passing into green; yellow-green and green, dull bottle green; blue-green, very somber blue; blue and violet, black, except metallic yellow with long exposure (which would blacken the rest of the spectrum); beyond violet, violet–black. These colors did not appear simultaneously and could not be fixed. A bath in sodium thiosulfite, Herschel's fixer, destroyed the colors.

The *prehistory* of color photography is much older than that of black and white, if one counts observations of dye colors fading in sunlight that undoubtedly go back to ancient times. This process, by itself, is capable in principle of yielding a color photographic image. Such processes were tried by Sir John Herschel (his vegetable dye experiments) and again in the late 19th century, then called bleaching-out processes. Start with a range of light sensitive dyes, in cyan , yellow and magenta. Generally each dye will fade most quickly when exposed to light which is its color complement, as this is the color it absorbs most. In this case the complementary colors to those above are the primary colors, red, green and blue. Two problems bedeviled this scheme: the most "fugitive" dyes that were tried were too insensitive to result in fading at reasonable camera exposure times. Secondly, some were too fugitive: no means was found to prevent their continued fading; the image could not be fixed. Image impermanence is still a problem for color photography (including modern digital printed images), though progress has been made. A form of bleaching out is used in some modern color print processes.

Color *theory* also had a considerable pre-history by the early 1800s. Newton had (mid-1600s) broken white light into its spectrum of colors and had shown that recombining just three colors, red, yellow and blue, would reconstruct white. Jakob le Blon used those three colors to do the first practical 3-color printing in 1667, having also concluded that they were sufficient to reproduce all the colors of the spectrum. Mixing red, green and violet light also gave white, and suggested (around 1800) to Thomas Young that the human eye is sensitive to just these three bands of color. This theory was elaborated by Helmholtz, Maxwell and others in the middle 1800s.

At the beginnings of photography in the 1820s the gentleman farmer-scientist Joseph Nicéphore Niépce (later linked to Daguerre) systematically tried a range of photo processes that included using various resin and other coatings on metal plates. It is well known that this eventually resulted in the first photographs, using a modified *camera obscura*, in 1827 and 1829. Less well known is that some of the other processes he tried did perhaps yield color images. Their potential has recently been demonstrated by J-L Marignier at Orsay and Marc Kereun of Paris, in trials using Niepce's original recipes. Exposure times were very long.

However, neither Daguerre's process nor Talbot's

process of 1839 recorded natural colors. Overexposure of the sky could lead to solarized daguerreotypes in which the sky, appropriately, looked blue, but otherwise there was no color. This was a disappointment to the general public, but did not really slow down the arrival of the new market in photographic images. It exploded.

The appeal of color was very strong. The failure of photography to provide it left a hole in the market. Soon, artists who had specialized in painted miniature color portraits stepped in by learning to hand-color daguerreotypes, and later also Talbotypes, ambrotypes, tintypes and other black and white processes that soon appeared. The images by the latter processes were hand colored up to about 1900. For daguerreotypes, beautiful results were achieved, but they required great skill. The colors were applied as powdered pigments by brush onto the Daguerreotype surface. The image layer, a thin surface film, could be marred or removed by the slightest misapplication.

In the 1840s Edmond Becquerel, a member of the Becquerel physics "dynasty" at the National Museum of Natural History in Paris, experimented with variations of the daguerreotype process, and found that he could create a color-sensitive coating by dipping the standard polished silver plate into a solution of chlorinated water and sending a current through the solution, using the plate as an electrode. He observed the plate go through color changes and stopped the process when a certain color was achieved. This succession of colors was almost certainly due to light waves reflected off the mirror[-]like plate interfering with incoming waves in the thin films he created during sensitization. These were analogous to colors seen in thin films of gasoline floating on puddles of water. He exposed these plates to the solar spectrum and recorded the spectrum colors relatively faithfully, according to his 1848 paper and contemporary accounts. However, these images were fugitive in light. A few remain, kept in the dark, at the Centre National des Arts et Metiers in Paris, at the Musée Niépce at Chalon-sur-Saône, and at the Science Museum in London.

At almost the same time the Reverend Levi Hill of New York explored the same problem. He announced his success in making colored daguerreotypes prematurely, which created a market stoppage for black and white portraits and a considerable controversy. When he finally published his technique in 1851 it was so complicated that no one repeated it, even though the well known inventor Samuel Morse testified favorably as to the results. This process was widely labeled a fraud, but recent reconsideration suggests otherwise. William Becker published articles which carefully examined the controversy and reproduced some of Hill's images. He concluded that Hill had succeeded. Then Joseph Boudreau tried Hill's recipe, and published his experiments in 1987. More recently Arron Miller also repeated the process with unspecified modifications and essentially equal success.

Examination of the surviving Hillotypes and Becquerels shows that there is no question that each man recorded color, but of a peculiar and perhaps related sort. The prevalent color in each case is now a deep aubergine. On the Hillotypes one can make out just two instances of another reasonably saturated color, yellow. On the Boudreau image at the Smithsonian there is a wider variety of colors, including blue and green as well as yellow and a faint red, but none saturated, all dark, and underlain by aubergine. Its wider color range may well be the result of its lower age. The colors probably fade, at least in light, though the Hillotype colors seen recently at the Smithsonian look similar to those published by Becker 20 years ago.

The Becquerel images in Chalon, like the Hillotypes, can be viewed briefly in dim light. The colors orange and red at one end of the spectrum are clearly visible, and the other colors are very faint if present, along with the aubergine. Because there are no notes or marks on the plates, it is impossible to say what parts of the spectrum these correspond to.

In 1849–52 Niépce St. Victor (Niépce's cousin) did an all-chemical version of Becquerel's process, for which just a few examples survive. It was recently reprised by David Burder, and consisted of subjecting a metal plate to several metal salt solutions resulting in a silver chloride sensitive layer. Burder's exposure time to contact print a color transparency was several hours. The colors were initially essentially correct as to hue, but not well saturated. Exposure to light causes them to fade. Their surface, like Becquerel process images (and unlike daguerreotypes), is quite durable. Their color can be restored somewhat by rubbing.

Alphonse Poitevin, working into the 1860s, repeated and extended the earlier work with silver chloride on paper by Sir John Herschel and others. After pre-exposure to light, he bathed the paper in metal salt solutions (also various plant extracts) and exposed it while damp. He achieved some color by contact printing through stained glass (never in camera). The images were not stable. In the Exposition Universelle, Paris, 1867 his images and those of Niépce de St. Victor were shown in locked albums only opened briefly and upon request. No examples of Poitevin's images are known to survive.

Very recently John Hurlock of Chicago made daguerreotypes sensitized with silver chloride that show a strong yellow image of a yellow house. They seem to be permanent.

The physical explanation for these (in some cases poor) colors is still to be determined. Zenker, in 1868, maintained that they were entirely interference colors. Wiener, who reconstructed Becquerel's process in the 1890s and conducted various tests on the resulting

plates concluded the same. Recent observations suggest they were not. Rather, they were some form of scattering color related to grain size. The verdict relates to Lippmann's color process and awaits electron microscopic examination and other tests.

In any case, no practical color processes were conceived until the decade of the 1860s and none succeeded until almost 1900.

WILLIAM R. ALSCHULER

See Also: Colour Theory and Practice: 1860–1910.

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COLOR THEORY AND PRACTICE: 1860–1910

Processes (positive)

The 1860s was a decade of great conceptual advances in color photography, which laid the foundations for ultimate success, yet no practical results flowed from these advances for almost 30 years.

In that decade James Clerk Maxwell (1831–1879) was working on both the theory of color and on the electromagnetic wave theory of light, the last great triumph of classical (pre-Einsteinian) physics. At a public lecture in 1861 he showed that full color images could be made from a combination of 3 separate color photographs. He chose a tartan ribbon as a subject, and made black and white photographs through a red, a green and a blue filter. These were developed into negatives and then reversed into positives. The three transparencies were then each projected through the filters they were taken with, mounted in three lantern slide projectors of a conventional sort. The images were carefully superimposed on the projection screen and a full color image resulted (of modest color quality). This three-color separation process was not immediately commercialized in photography (but see Frederick Ives below).

There is one curious thing about this famous experiment: it should not have worked! In 1861 there were no films sensitive to red or yellow light and most were barely sensitive to green light. So how did the three colors record to give a true color image? In 1961 Ralph M. Evans showed that the red filter Maxwell used also transmitted light in the ultraviolet, to which the film was sensitive, and which was well reflected by the ribbon. The film was exposed until the negative was usable and

by chance its contribution to the colors gave a "red" which was about right.

In 1862 Louis Ducos du Hauron (1837–1920) sent one of his friends a letter, to be read at the French Academy of Sciences. It described several ideas for color photography based on color separation. The paper was never presented. du Hauron continued his work, making some early images which combined photographs and carbon-based pigment prints, which still exist and are rather beautiful. By 1867 he had refined and expanded his ideas. He received a French patent on them in 1868. In that patent and one received in England in 1876 du Hauron laid out *all* color processes, save one, attempted since.

In 1869 he submitted a paper on his ideas to the Société française de photographie. Completely independently and unbeknownst to du Hauron, Charles Cros (1842–1888), a French poet and dilettante who among other things, invented the disk phonograph before Edison, submitted a detailed proposal for one of these ideas to the Society within days of du Hauron. The papers were opened and read at the same session. It turned out Cros had also sent a sealed letter describing his ideas to the French Academy of Sciences in 1867. A potential priority dispute was fairly quickly squelched by the actions of both men, who quickly became friends.

Their common idea was that of sandwiching three layers of emulsion, each absorbing one of the 3 primary colors, each containing a dye that passed its color complement. This process is the basis of every successful modern color process, and is usually termed a "subtractive" process.

The other main classes of ideas outlined in du Hauron's patents, termed "additive," included the color separation processes, as first demonstrated by Maxwell (see above), and the color screen processes. The latter included various schemes to filter the picture plane into small regions of the three fundamental colors, for taking and viewing.

All these ideas were initially impossible to implement, because the emulsions of the day were only sensitive to blue light (termed isochromatic), whereas every proposed color process required making images which included the whole of the spectrum. In the early 1870s the German chemist H. W. Vogel (1834–1898) discovered by chance that adding dyes to the silver halide-based collodion and gelatine emulsions could extend their sensitivity out into the green, and orthochromatic emulsions resulted. His discovery was not immediately accepted as, for a short time, others failed to duplicate his results. When he pointed out that they had used such high dye concentrations that all light was absorbed before reaching the silver halides, and lower concentrations would do the trick, he was ridiculed. One critic reasoned (falsely) that following Vogel's suggestion, it was logical to expect that the dye would work best at zero concentration, not realizing that Vogel was correct and that there was an intermediate optimum concentration.

In the 1880s and 90s Vogel and others systematically extended this idea into the yellow and red, as well as showed that dyes could enhance the emulsions' original sensitivity in the blue. This advance created increasingly sensitive black and white emulsions. By the 1880s this improvement, coupled with advances in the speed of photographic lenses, permitted photographers routinely to take exposures at speeds greater than 1/30th of a second, allowing the making of what were called "instant" images that could freeze ordinary motion. This created a rage for motion capture, as well as the possibility of making sequences of moving images. It also made possible the creation of panchromatic emulsions for color (and black and white) films, and the possibility of stable dyes to use in the resulting final colored images.

The separation processes were pursued by du Hauron and others. In the 1860s and 1870s he built cameras, camera backs and viewers (Chromographoscopes), designed to take and display three color-separated plates in sequence or simultaneously, and tried to commercialize them. He was not successful, though as mentioned above, some of his carbon-based prints, which required no viewer, survive, as do some of his Chromographoscopes.

The 1870s and 1880s saw attempts to make practical use of du Hauron's ideas, but with little success. In the early 1890s the situation changed. In the U.S., Frederick Ives (1856–1937), already known for his inventions in color printing processes, turned to color photography and made a range of cameras, viewers and projectors to employ the 3-color separation process, using the new panchromatic plates and films. He called his equipment Kromscops, riding the commercial coattails of the letter "K" which resulted from George Eastman's success with his *K*oda*k* cameras. In some versions the images were made in succession, for which the equipment was a sliding back, and optically straightforward. In others, using a more complicated arrangement of internally mounted color-separating ("dichroic") partially reflecting mirrors, the images were made simultaneously. The latter arrangement was bulky, but avoided the problem of color fringing due to subject movement between exposures, which images by the other method suffered from. He lectured frequently and widely, disputed the importance of du Hauron's and Cros' ideas, and tried to sell his equipment on the Continent as well as the U.S. He was modestly successful.

Also in the 1890s the first screen processes hit the market. McDonough in the U.S. in 1892 and Joly in Ireland in 1894 each patented and began to sell film and screen filters for making color photos by this general

scheme. It was described by du Hauron in his 1868 patent: "Finally there is another method by which the triple operation may be effected on one surface. The separation of three elementary colors may be effected no longer by three colored glasses, but by means of one translucid sheet covered mechanically by a grain of three colors." McDonough's patent refers to this grain idea, later used successfully by the Lumieres, but he gave up on it and adopted the ruled overlapping line-screen approach, as used by Joly and a number of others. These screens consisted of fine lines alternating red, green and blue. The layout varied, in some cases they were interleaved parallel colored stripes, in others the screens crossed each other at right angles, yielding color patches which were square. The image was recorded through the screen on black and white film, developed and either redeveloped to a positive or a positive copy was made. In most of these processes the final positive was mated with a color screen identical in layout to the taking screen, and in other versions the screen was bound to the emulsion from start to finish. (The former version suffered from color fringing and Moire patterns if the screen and image were not perfectly aligned. The Paget process in England, and the Dufay color and Omnicolor (du Hauron's last hurrah) processes in France, came on the market in the early 1900s and the latter two enjoyed reasonable success. All these processes were slow compared to black and white, and required exposures of several seconds in bright sunlight, even with the fastest films. A particular disadvantage of the regular line screens was that, though their patterns at 200 to 400 lines per inch were invisible to the naked eye on the originals, modest enlargement would reveal the pattern, which was annoying.

In 1891 a radically different color process, the interference process, the one not predicted by du Hauron, was announced by Gabriel Lippmann, professor of physics at the Sorbonne. He was motivated to invent it in order to confirm the wave nature of light, and according to several of his accounts it took him 12 years to achieve a fine-enough grained emulsion for the purpose. He realized light could be made to record itself, color by color, if a way could be found to let each color (wavelength) interfere with itself, and to capture that standing wave pattern of nodes and vibrations on film. Each layer created would be a half wavelength from the next, throughout the depth of the emulsion. He completed a full mathematical theory based on Fourier analysis, employed in the same way as it was used to analyze complex sounds, before he achieved any experimental results.

To record blue, which has the shortest wavelength, required resolution better than 10,000 lines per mm, a factor of 100 better than most commercial films today, and as good as the best current holographic films. He imagined the pattern could be created by reflecting the image's light back on itself using a mirror, but due to the impurity of ordinary light the pattern would exist in a layer of space in front of the mirror only about 2 microns (0.002 mm) thick. To provide the required perfect contact between mirror and emulsion, he ingeniously employed a special plateholder with a thin pocket behind the plate into which he poured mercury. The emulsion faced the mercury and away from the camera lens and light entered through the plate's glass surface. He first demonstrated the recording of a spectrum, a 12-hour exposure, on silver halide albumen emulsion. He also pointed out that any panchromatic black and white emulsion of sufficient resolution would work and he demonstrated this by showing images on collodion, silver halide gelatine and dichromated gelatine. St. Florent made Lippmann images using iron salts in gelatine. Recently Hans Bjelkhagen and Jean-Marc Fournier have produced Lippmann images in photopolymers.

There was controversy at the beginning over whether this process gave good color. But after the Lumiere brothers tried it, along with Eduard Valenta and Dr. Richard Neuhauss who improved on Lippmann's emulsions, there was no doubt of its potential. Eduard Steichen commented in a Camerawork issue of 1908: "The rendering of white tones was astonishing, and a slide made by one of the Lumiere brothers.. a slide of a girl.. was simply dazzling, and one would have to go to a good Renoir to find its equal in color luminosity." Altogether perhaps 8 to 10 professionals and about twice as many amateurs tried the process. Around 1900 Penrose in England produced the special plates and plateholders required, as did Cheron and Mackenstein in Paris and Jahr and Zeiss in Germany. More than 500 images exist by the Lippmann process, and some of these, including portraits, still lifes and landscapes, have truly spectacular color.

Over the next decade Krone and then Rothe showed that Lippmann pictures could be made without the mercury mirror, relying solely on the slight reflection of light at the gelatine-air interface. The colors were less saturated. Today a few people are trying to improve on this approach, including the author, and the abovementioned Mr.'s Bjelkhagen and Fournier.

Lippmann's process provided amazing color, color permanence (no dyes were needed for the final image, and the emulsion was sealed from the air under a prism used to improve viewing contrast), and superb resolution that allowed immense grainless projections. Nevertheless, the process was never commercialized. Perhaps one reason was that Lippmann did not patent it, which lowered the incentive for a manufacturer. Nonetheless, the Lumieres tried hard to industrialize it from 1891 to about 1895. They were not able to achieve reliable results. This was likely the decisive factor, though others were

undoubtedly contributory, including the long exposures (a minute or more in sun), lack of direct duplicability (like daguerreotypes before), and somewhat awkward viewing arrangements.

Having given up on the Lippmann process, the Lumieres next tried a wash-off dichromated gelatine process, which they called the Chroma process (trademark written in Greek). It resulted in rather garishly colored transparencies, examples of which can be seen in the Lumiere collection in Lyon). As their efforts in this area drew to a close in about 1897 they started work on a screen process based on randomly colored tiny grains of potato starch. This they industrialized brilliantly well. They devised a flotation method to sort the grains by size, and optimized the grain size by exposure test. They tested hundreds of dyes both for coloring the grains and for sensitizing the emulsions (their notebooks still exist in Lyon). They ended up using orange, green and blue-violet dyes for the grains. They produced a sticky varnish to coat their glass plates, sprinkled the mixed dyed grains onto it. They used a self-invented rolling machine to squash the grains as flat as possible and then sprinkled on powdered charcoal to fill in the interstices between the grains to block unfiltered light from reaching the emulsion. The final step was to add a sensitized black and white gelatine layer. The photographer shot the picture, and exposure times were several seconds in sunlight, then developed and reversed the negative to a positive, and mounted a second piece of glass to protect the emulsion. Viewers were made by others. The resulting transparencies were often lovely, easily viewed, and the process straightforward. The randomness of the grains gave a more pleasing effect than any of the line screen processes. Their grain gives them a visual quality like that of a pointilist painting.

The Lumieres patented the process in 1904 and marketed it starting in 1907 as the Autochrome process. It was the first successful, and for almost 30 years, the dominant color process. It brought color photography to amateurs as well as well known photographers. Some really beautiful images by Stieglitz, Steichen de Meyer, Genthe and others still exist. Millions of plates were sold world-wide. From about 1908 to perhaps 1912 they manufactured them in a plant in Vermont, as well as in Lyon. They were supplied as quarter and half-plates, and also as stereo plates. The Lumieres gave a number of public presentations of their images in both Europe and the U.S. Recently, Prof. Jean-Paul Gandolfo of the Ecole Louis Lumiere and Bertrand Lavedrine of the CNRS excavated the Lumiere's rolling press and had it hauled to Paris. They are in the process of restoring it to the making of Autochromes.

In 1909 Albert Kahn, a financier, created a project, *les Archives de la Planete*, to document the whole world in color photos. He under wrote travel and the cost of buying and processing Autochrome plates for a select group of well known photographers. The result was a compilation of more than 100,000 images, now housed, displayed and published at the Musee Albert Kahn, near Paris. Shortly after, the National Geographic magazine started using Autochromes for its color photos. The Society now holds a collection of nearly 60,000 images in its Washington D.C. headquarters.

Eventually the Lumieres came up with a film version, called Filmcolor. They eventually made faster versions, including Filmcolor Ultrarapide and Lumicolor Ultrarapide. By the late 1920s there was competition, chiefly Agfacolor, a similar random grain process using droplets of shellac as the colored grains.

In about 1935, after years of intense effort, two musicians with a fierce interest in color photography, Leopold Mannes and Leopold Godowsky, working alongside the laboratory experts at Eastman Kodak, succeeded in realizing du Hauron's dream of a 3-layer-in-one process. The result was Kodachrome, and with its higher speed and more saturated color it drove Autochromes out of the market in about 5 years, though Autochromes were produced for many more. The Lumiere Company never recovered, and eventually Ilford bought their operations and closed them down. The modern era of color began. Today digital color, based on electronic cameras, is invading the market.

WILLIAM R. ALSCHULER

See Also: Maxwell, James Clerk; Ducos du Hauron, André Louis; and Eastman, George.

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COLOURING BY HAND

When the first daguerreotype images were produced, many people were disappointed that the photographs did not reflect the true colours of nature. The cold appearance of the monochrome metal plate could be unflattering for portraiture. Lines and blemishes were often emphasised by the process. Some colours in nature did not respond well on the daguerreotype and the photographer and entrepreneur, Richard Beard (1802–88) warned against black, white and violet clothing as these colours did not represent themselves well. He promoted silk and satin due to the play of light on these surfaces. The introduction of hand colouring helped to hide these discrepancies and added warmth and natural flesh tones to a portrait, complementing the sitter.

Not all photographers agreed with the introduction of hand tinting, however, the renowned American photographers Southworth and Hawes believed it unnecessary. Francois Arago, the scientist and secretary of the Academie des Sciences believed hand colouring ruined the natural daguerreotype image. He stated that:

> 'to hand-tint a lovely image, even by the hand of an artist of repute, is as if one should set a sign painter to retouch the wings of a butterfly.'

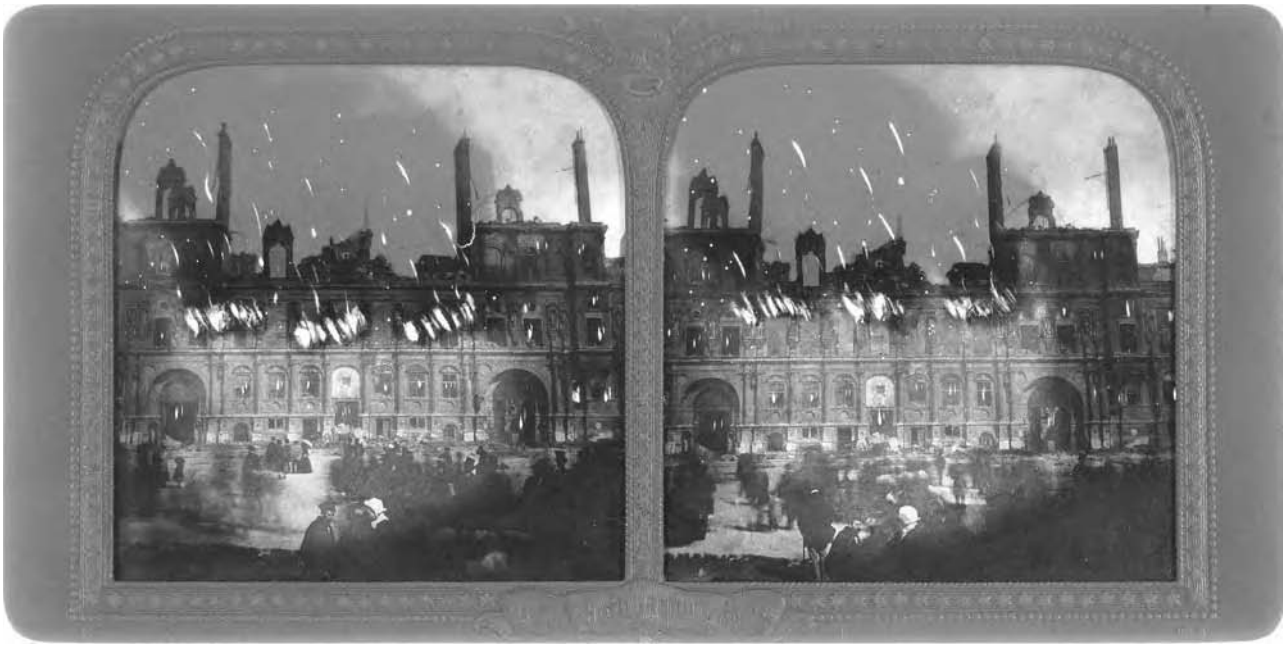
Despite these criticisms, hand-tinting soon caught on with the public and provided extra income for photographers. Most photographic studios charged extra for a tinting service. In 1853 Hay and Wilson of Aberdeen charged from12/6d to one guinea extra for this service. Hand colouring was an extremely skilled task and was carried out by a colourist. Most colourists were former miniaturist painters, many of whom had lost their previous career with the introduction of portrait photography. As reported here in *The Photographic News* Feb, 1859, 255:

> 'There can be no doubt whatever that the miniature painter's 'vocation' is gone…By the old system of miniature painting about a score of sittings were necessary…while now by means of photography, only one sitting of half an hour is necessary in order to produce the most elaborate and finished miniature.'

Colourists would make a tracing of the portrait on glass and then a paper stencil was made for each colour. The dry powder colour with gum arabic was shaken over the stencil or applied with a fine camel-hair brush. By breathing on the plate, the gum arabic was thus fixed to the plate. Alternatively, the plate would be painted with a thin layer of gum arabic, then breathed on to make it sticky. With a fine brush the powder pigment was applied carefully. There were occasionally mistakes, but most colourists were masters of their art. Later with the introduction of paper prints, albumen paper was tinted in various colours, some of which have now faded.

Daguerreotype portraits where the sitter is wearing jewelery were often highlighted with real gold, or the plate was scratched away to reveal the silver underneath. This was highlighted and glimmered when it caught the light. Richard Beard patented colouring Daguerreotypes in 1842. He had opened the first photographic portrait studio in London in 1841 on hearing of the success of the first studio in New York. Beard produced fine hand tinted examples such as "Portrait of Fanny and Henry Mason." C. 1852 7.5 × 10 cm (quarter Plate). The delicate quality of the lace is beautifully emulated, as are the subtle flesh tones. The sitter is placed in front of a painted backdrop of a stormy dark blue sky and a column to give depth to the composition. The gold is brought out of the necklace and ring.

Antoine Francois Jean Claudet (1797–1867), a French born photographer who moved to England, was one of the earliest photographers to use hand-colouring and his technique was one of the first to be used in the manuals on photography. As early as 1844, he was colour tinting his daguerreotypes and using painted backdrops to give added depth to the composition. As the idea caught on, there were soon several photographers using the hand colouring technique. Claudet's was however, considered one of the best in Europe. Even his French rival Alexis Gouin praised Claudet for his beautifully coloured portraits. It was thanks to Claudet's skillful colourist that he was able to achieve



Elliott, Joseph John. Hotel de Ville, Paris.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum

such hand tinted masterpieces. Whilst working in the Regents Street Studio, Claudet employed Andre Leon Larue, known as Mansion as his colourist. Mansion was a miniaturist painter born in 1785, the son of *Jacque Larue*, a portrait painter. Mansion wrote at least two books on miniaturist painting. The second of which was *'The Principles and Practice of Harmonious Colouring in Oil, Water and Photographic Colours on Paper, Glass and Silver Plate.'*

Critics were very impressed by Mansion's skill and in the *Art Union* 1845,1st June, p. 171, it was written that:

> '...no human had ever obtained such brilliant effects as these which result from the combined labours of nature and art.'

Mansion had his own technique of colouring plates, using a palette made up of fifteen colours which he had learned as a miniaturist. Hand tinting kits were eventually on sale such as the Newman kit dated 1850 which had thirty-six colours.

A beautiful example of a tinted photograph taken by A. Claudet and tinted by Mansion was the portrait of Mrs Andrew Pritchard 1847, Victoria and Albert Museum, London. The subtle beige of Mrs. Pritchard's dress is complemented by the painted landscape backdrop and her jewellery is highlighted in gold.

Claudet was aware that it would never be possible to produce daguerreotypes in natural colours. Despite this, he continued to carry out research into the solar spectrum. At the Great Exhibition in the Crystal Palace in 1851, Claudet exhibited a daguerreotype showing the spectrum and illustrated the different refrangible rays. Claudet delivered a paper discussing the sensitivity of the photographic surface to colour media to the Royal Society but never had the opportunity to follow this concept through to its full conclusion.

It was not until 1861 that James Clark Maxwell was the first to demonstrate the additive colour process. He superimposed three photos through red green and blue filters, then projected the original in full colour. In 1869 Louis Ducos du Hauron discussed the possibilities of natural colour in photography in his book *Les Couleurs en Photographie Solution du Probleme.* In 1895 Professor John Joly of Dublin presented the first additive screen plate colour process and finally, in 1904 Auguste and Louis Lumière patented the autochrome process, which was to dominate the world of photography for the next thirty years and made orthochromatic photography possible.

LAURA CLAUDET

Biography

In 1839 the daguerreotype was presented by Daguerre. There was disappointment that daguerreotype images were not in colour. Richard Beard patented the colour tinting process in 1842. Critics such as Francois Arago were against the hand tinting of daguerreotypes. Many of the colourists were former miniaturist painters. The hand tinting process involved coating the plate with gum arabic, then brushing on powdered pigment with a very fine brush. Andre Leon Larue, known as

Mansion a renowned colourist worked for A. Claudet during 1840s and1850s. Auguste and Louis Lumiere patented the autochrome process of colour photography in 1904.

See Also: Daguerreotype; Beard, Richard; Southworth, Albert Sands, and Josiah Johnson Hawes; Claudet, Antoine-François-Jean; Maxwell, James Clark; Ducos du Hauron, André Louis; and Lumière, Auguste and Louis.

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COMPOSITION

Before the invention of the calotype (and the daguerreotype), artists and amateurs used various drawing devices. The *camera obscura* became the camera. Instead of tracing a drawing of what was seen, the 'camera' could now impregnate a description of what was seen onto a piece of paper. The use of this instrument which could be the size of the palm of a hand or a table, was designed as an *aid*, that is, its function was already prescribed before it came into existence—such instruments go back at least to the 15th century, to Durer's woodcuts of 1525–38 of drawing machines, or even before. It is only post the invention of photography that their use became dislocated and, until the 1960s almost entirely forgotten, so that, post the invention of photography, during the 19th century Romantic period, artists took flight; as the French artist Ingres commented, "It is to this exactitude that I would like to attain, it is admirable—but one must not say so." Instead artists were now to be deemed to be good draughtsman solely by their individual dexterity, their talent of genius. This was a historical lie, told because it suited the culture of the day to think it so. But today we can acknowledge the debt that artists such Durer, Mantegna, Vermeer *et al* owed to such aids. Indeed it may well be that often those Renaissance 'mysterious' constructions in paint, including their compositions, are probably only mysterious to our eyes because we no longer know exactly how such devices contributed to the end results.

When William Henry Fox Talbot, on his honeymoon in 1833 to Bellagio, Italy, using his little Wollaston's *camera lucida* in his hand and tracing tentatively a description of Lake Como, thought about the possibilities of fixing nature's image permanently onto the paper to obviate his necessity for continuing to draw badly, artists and some scientists had already thought about this possibility for around four centuries. What he produced in drawing was a good example of how the aid was used, that is, its use was limited to the perception of how it 'could' be used. In the amateur results of the use of such instruments we can see clearly that, in spite of what was seen on the ground glass screen, the view in front of the *camera obscura* had still to be translated into a 'good' composition; that is, one that followed a known and accepted formula of that time of what constituted a 'beautiful picture.' Similarly, in the first place, the view chosen for study, particularly amongst amateur users, would be selected if it conformed to that which was acceptable, fashionable. In Britain, around the time of the invention of photography in the 1840s, that conformity would be to produce images that accorded with the tradition of the Picturesque, of William Gilpin's *Three Essays* (1792). Gilpin (amateur artist) argued that it is the artist's task to supply 'composition' to the raw, inadequate, nature, and that while looking at nature, this task is to recognise when it behaves itself; supplies that which is agreeable to the art of making a picture. In other words it was a known quantity. This has continued to our time, for example, the accepted criteria *applied* to photography in some quarters resulted in 'rules' of

engagement, such as, the use of the golden section, the third to two thirds; that the tree should always be placed at the left hand side, a third of the way into the picture, and that the sun should be always behind and over the left shoulder; that the horizon should be lower than the middle and never higher.

Of course, artists were more knowledgeable than Gilpin and were well versed, if not verbally articulate, in the various histories of composition and its fundamental importance in the creation of meaning. That book has still to be written for it would need to trace the subject back to at least the Greeks; to Aristotle's *Poetics*, "If any of the parts be either transposed or taken away, the whole will be destroyed or changed"; back to the importance the Renaissance attached to *composito*, to the 17th century European Academies with their 5 elements: Invention, Proportion, Colour, Motion, Disposition. All knew that in order to convince the audience of the reality depicted in the image, the *truth* of it, firstly a process of observation of reality, of 'nature,' had to take place, followed by an analysis, then a distillation, then re-invention. All had to be put together within the structures of composition; the classical Greeks called it: *synthesis*, Plato's 'organic whole.' Fox Talbot, in his *The Pencil of Nature* (1844–46), the first ever publication to include photographs, acknowledges this with his 'air of reality':

> "I have observed that family groups are especial favourites: and the same five or six individuals may be combined in so many varying attitudes, as to give much interest and a great air of reality to a series of such pictures."

It was inevitable therefore when the new toy appeared, as is the case today, it would firstly be used to imitate that which it sought to replace. Fox Talbot, it is suspected, did want to make images 'drawn by the sun,' but he would have wanted them to be translated into Picturesque images, of acceptable beauty, that accorded with all the values of why, culturally, pictures were wanted at that time. And, as can be seen in his publication, *The Pencil of Nature*, concerning his photograph of 'Articles of China,' he marvels at the extraordinary detail and accuracy but then he adds perceptively, "It may be said to make a picture of *whatever it sees*." This explains much of the cultural revolution that would now take place as a result of the invention of the photograph, that is, by its own influence, *by its very nature*, unrelated to the user or the users' abilities.

In the *Pencil of Nature* Fox Talbot conducts a scientific and aesthetic analysis of what his new invention, his aid—for that must have been how he envisaged its purpose originally, was for, could do, then he noticed that it did not behave according to his preconceptions and instead opened up a large new terrain, one without answers attached. In spite of the Industrial Revolution and all its progress in the mechanical field, it was this new invention of photography that ushered in our age of technology. Talbot noticed it, but many photographers never did and others only a long time later, in the next century. For the most part his perceptive observations went unnoticed. The audience remained simple mesmerised.

Some photographers took the need to conform to the accepted conventions of picture making much further with compositions that imitated the 'best in painting,' from Renaissance triangles (originally used to produce the hierarchy of kings or Madonna's), to compositions which turned everything into the centre of the image; to be complete within the picture frame, that is: to create a complete world within the two dimensional space that had no references to anything outside it. In many cases such images were arranged in accordance with the best practice of Victorian painting. However an audience cannot read Oscar Rejlander's *The Head of John the Baptist in a Charger*, c. 1857–58, as a severed head simple because, unlike the painting, the over riding attribute of the photograph is that it records, for better or for worse, for real or fiction, an actual moment in time. When the photograph was used to imitate the conventional compositions of painting, past and present, for the most part, it actually failed to convince unlike the paintings they imitated.

Even when photographers noticed that this new machine could interrupt actual time which they had never been able to do before, for the most part it was just the detail that mesmerised; the advocacy of the verisimilitude of the photograph by John Ruskin (1819–1900) which legitimised the use of photographs as painting aids by the new Pre-Raphaelite painters, of Holman Hunt and Thomas Seddon, resulted in the painstaking imitation of its ability to record detail but missed the many characteristics of the new medium.

Fox Talbot observed first hand the waywardness of nature, that it went about its business completely outside the concerns of man, that it did not seek perfection and that it had no regard for human values. Put another way: the camera gave credibility to Charles Darwin's *Origin of the Species* (1858). He also noticed that man simply interrupts nature, that the photograph of the bridge traversing the ravine, unlike all that history of painting such subjects, looks and is profoundly man made and apart from nature. He also noticed that for *order* in a picture to exist, it must first be placed there, created in front of the lens by various means of controlling composition. He further observed that the description of reality, instead of being simply applied, could now be created solely by his machine, and he touched upon the observation that by recognising this new phenomenon, a different world appeared.

As we have noted, the use of composition to create

meaning in the observer was fundamental to the Western tradition, indeed, well known to the Roman and Greeks before the Renaissance: that projected 'reality' has to be the product of astute re-creation and that composition is one device used to create the illusion of that reality. Some photographers did notice something different about photography—that, when controlled, it could create *precise meanings* especially if composition was used effectively. While photography, like etching, is a subtle art, it can nevertheless be impregnated with intended meanings. To give one example: of all the photographs of the *Equestrian bronze statue of Marcus Aurelius standing in the square of the Capitol, Rome* taken in the 19th century, not many are found by the Scottish photographer Robert Macpherson (1814–1872), which relates the object, the statue, to its surroundings and locates the head of Marcus Aurelius within the window pediment of the Capitoline Museum behind it and, with equally exact mathematical precision, lines up the horse's front leg and tail to fit within the boundary of the two columns of the window. This produces, within the confines of the use of photography as a two dimensional graphic art, a perfect harmony between the sculpture and its stage set, resulting in a picture of supreme nobility. Technically, in order to achieve such a line up, it had to be taken from a point suspended above the normal eye level, probably from a ladder and/or by the use of a tilt lens. All other photographers of this sculpture, and there were many, ignore the surrounding building which nevertheless becomes part of the image, thus forgetting that *everything* that occurs in the picture must be constructed for a purpose, that if meaning is to be created, it is created from a knowledge of composition, from the ability to compose.

There was an exception to Fox Talbot who fooled many into thinking that it was his individual genius that was able to create an entirely new language; one that pushed art forward. Later he was to 'fool' many art historians who seemed to prefer to give, as explanation of his imagery, the influence to the more intellectually acceptable Japanese woodcut that entered Europe for the first time in the mid-nineteenth century and which had became much loved, particularly in France. That artist was Edgar Degas (1834–1917), painter, sculptor, printmaker, draughtsman (and photographer) who had been trained in the Renaissance tradition, well placed, therefore, to notice a new and different visualisation. He, more than most, had observed, perhaps early on even unconsciously, what happened to 'reality' when it was interrupted by photographers who were *not* part of the visual tradition; who used it, in comparison, crudely, badly; allowing it to be itself. Degas then *re-translated* this new vocabulary by applying the same principles as the Renaissance/Academy, exactly as he had been trained to do: observe, analyse, distil, re-invent. Those who praised his new way of 'seeing,' his unique genius, never noticed that it was rooted in an astute perception and understanding of how photography actually works. Those who labelled it as unworthy as a snap-shot had entirely missed the point. Degas was able to articulate in paint many of the observations of Fox Talbot that had gone ignored. Such was the incomprehension of fellow artists and critics that, ironically, Degas' paintings began to influence photographers and fellow artists so that, for example, the young Edward Steichen, photographing the races and street scenes in Paris at the end of the century, interrupts time consciously when he observes a similarity of composition to that of the radical painter, Edgar Degas. All art, as Oscar Wilde observed, influences art. We can add to that: knowingly or unknowingly.

Most of the characteristics of photography, the workings of the camera and its lenses, are to be found in Degas' paintings: the blurred, out of focus, differential focused image; scientific movement (not seen by the eye); the specifics of camera angle, camera view point, lens perspective (especially distinct from Renaissance perspective); distortion and the acceptance of *none* information conveyed by the photograph for this never existed in visual art prior to photography, such as the absence of specific tones in order to explain light and shade as volume as hitherto all artists had been taught Renaissance formulas for drawing three dimensionally onto a two dimensional surface; asymmetric composition (certainly to be seen in Japanese prints); cut-off composition (hardly ever to be seen in Japanese prints made prior to the invention of photography, more likely if found to be a folded page or torn out print); use of height and distance as acceptable subject matter in their own right; giving more prominence to other matter at the expense of the apparent subject of the picture, for example, in Degas' 'The Rehearsal,' 1873–1874, a spiral staircase takes over and obliterates most of the dancers, meanwhile the Ballet Master nearly disappears, stage right; placing subjects against the light so as to be hardly seen; the depiction of (apparent) spontaneity, the accidental, the unplanned; including the incongruous and inexplicable to the point of looking unreal: consider the seated girl in Degas' 'Bellelli Family,' c. 1860: where is her other leg?

Degas' perception and use of photography was profoundly intellectual. In his painting of the 'The Cotton Office, New Orleans,' 1873, (*Portraits dans un bureau*), he depicts a strange interior which rushes to the back of the room, the perspective has not been made according to the accepted norms, it is more probable the result of lens perspective. While there has been much written on the influence of Japanese prints and their use of asymmetric composition, correctly so, they may have legitimised the acceptance of similar compositional structures now seen in photographs, a natural result of

Thompson, Stephen. Satyr, British Museum.
The Metropolitan Museum of Art, Gilman Collection, Purchase, The Horace W. Goldsmith Foundation Gift, 2005 (2005.100.510) Image © The Metropolitan Museum of Art.

the camera interrupting space, but the Japanese prints did not enter Europe until mid-nineteenth century. If Degas was only influenced by things Japanese then he would not have cut the man legs off at the knee (sitting stage front), nor would he have cut the hands off the man at the table stage right. To our eyes now we see such works as 'real' because we see photographically, but pre-photography this painting would merely look crude, inexplicable, badly composed, unnatural. It has a channel of nothing running between the man with no hands and the main group examining the cotton. There is a channel of windows running stage left to the back which directs your eye to the back of the room to find nothing of importance. It has a cupboard door sticking out, top right and a wood doorpost running down the entire left hand side. Put against the Renaissance tradition that had lasted nearly 400 years this is all a revolution. However the most important aspect is the meaning produced from this range of compositional, photographically-derived devices. Unlike virtually any other painting before its time nearly every participant, '*portrait*,' is going about his business without any regard for the other persons in the image. This is no longer a complete world, one of order and harmony, a *composito*, quite the opposite. The man at the desk has no interest in the man sitting in the chair with no legs who has no interest in the man reading the newspaper who has no interest in the man leaning up against the window who would appear to be equally disinterested in the two engaged in examining the cotton in front of him who have no interest in the two men walking through the room behind them. It is a profound image that heralds a new world, the industrial city with its money-making preoccupations, a dislocated community of self interest; while they are all busy at their tasks, they are profoundly lonely, nobody really connects. This picture tells of what we in the 'economic developed countries' were to become. While Degas' world foretold the coming of narrative cinema, many

painters and sculptors continued to seek refuge away from the camera and moved further and further towards none representational and finally abstract art.

Photographers in the next century were to probe endlessly, and still are, Degas' vision of that city life; think of Walker Evans, Henri Cartier-Bresson, Robert Frank, and they were to do it using the same compositional devices, that life's continuum could be interrupted by the camera and, if the photographer wished to place meaning into the image, then the means to do so, along with light and shade, would be to choose, recognise, how exactly the world, the chaos, had to be interrupted, composed now by photographic means, in order to do so. Although Degas and others similarly influenced had come up with a new vocabulary, a new way of seeing, he was nevertheless still operating in the tradition of Western realism. This tradition had brought into being the camera but, as a result, had also brought into being a new way of looking at the world, new ways of composing, which would be used to try and explain what our human condition might mean.

By the end of the 19th century the discipline of the tripod, the heavy plate camera, gave way to the hand-held camera with its instantaneous interruption, as foreseen by Fox Talbot, and was accepted as standard; the world was now to be described verbally and visually as if it were a photograph; little children brought up in the new age describe reality as if it is the product of the camera, later the movie, now, with us, alarmingly, the computer play game. While 'reality' had become the capturing of the images of light from that little hand-held *camera lucida,* it had also become freed from the art conventions of the past. Soon, by the end of the 19th century, the street could be interrupted in all its chaos, and, in the interruption, made meaningful by the static residue captured in an instantaneous photograph. It heralded 'The Decisive Moment,' essentially the 'photography of the street,' which was still to be rooted, albeit sometimes skilfully camouflaged, in that previous formula; that if meaning is *also* to be transmitted (as distinct from only providing documents), then precise composition is still required, just as William Henry Fox Talbot had quietly observed in his *Pencil of Nature.* When the middle of the 20th century eventually came, both photographers and artists, and a few art historians, suddenly began to observe that what some visual artists were now doing had already been observed by Fox Talbot and had been articulated brilliantly in the paintings of Edgar Degas whose eyesight was so bad that he found it difficult to go too much into the sunlight.

The creation of 'meaning,' in the end, be it in the photograph or the painting, is not arbitrary, irrational, by chance, but the product of careful thought. As Degas said, "Even when working from nature, one has to compose" and he added (what many photographers also know), "No art was ever less spontaneous than mine."

ALISTAIR CRAWFORD

See Also: Calotype and Talbotype; Daguerreotype; Talbot, William Henry Fox; *Pencil of Nature;* Rejlander, Oscar Gustav; Ruskin, John; MacPherson, Robert; and Degas, Edgar.

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COMPTES RENDUS HEBDOMADAIRES DES SÉANCES DE L'ACADÉMIE DES SCIENCES

The *Comptes rendus hebdomadaires des séances de l'Académie des sciences* [Weekly reports on the sessions of the Academy of Sciences] was founded in 1835 by physicist François Arago, then Secretary of the French Academy of Sciences, to serve as a regular and complete chronicle of the proceedings of the scientific body, which until then had only sporadically published memoirs; it is still in existence, albeit with a different format and title. In scope and frequency, it was a novel kind of publication, which answered not only the needs of scientific communication but also, and perhaps more importantly, the emerging social demand for vulgarization. As it was widely distributed in Europe and North America, it quickly became an international reference in science and technology. In the mind of the buoyant Arago, who was also a leading left-wing Parliament member, the purpose was as clearly social as it was scientific: the new periodical was intended to publicize the progress and social utility of science, in accordance with a broader agenda that enlisted the Academy itself into scientific education and even the promotion of inventions and inventors, as happened with the daguerreotype. From the first disclosure of "Daguerre's discovery" on 7 January 1839 to the famed announcement of photography to the world on 19 August 1839, the *Comptes rendus* reported week after week on the lengthy procedure of publication of the daguerreotype. Starting in early 1839, the periodical continually printed reports by physicists (especially Arago and his arch-enemy Jean-Baptiste Biot), as well as claims from inventors and scientists who, in France and abroad, had designed alternative methods of photography (such as William Henry Fox

Talbot, letters by whom appeared in several issues, and Hippolyte Bayard) or simply submitted improvements and observations. Photography was reported on in nearly fifteen different issues in the second half of 1839, and in about thirty in the first half of 1840; many of these papers, which described methodology rather than theory, were taken up by other publications throughout the world. The *Comptes rendus* was indeed the major scientific publication involved in the initial development of photography, and a quasi-official channel for its announcement. Remarkably, a method of picture-making that was hailed as a revolutionary and radically simple alternative to every known craft of depiction was thus given a fairly abstract and scientific definition, rather than a technical or visual one (actual practice was not discussed in the *Comptes rendus*, and there were no illustrations). Although passions surrounding the invention abated after 1840, the topic of photographic technology remained prominent in the *Comptes rendus*, with publications by Louis Daguerre, Alfred Donné, Léon Foucault, Hippolyte Fizeau, among others, on various processes of microphotography, astronomical photography, photographic printing and reproduction. With regard to photography on paper and glass, the French periodical advocated Louis-Désiré Blanquart-Evrard's process as opposed to the English collodion process, until Arago's death in 1853. Later on in the century, the *Comptes rendus* published important contributions on color photography and permanent printing techniques.

François Brunet

See Also: Arago, François; Daguerre; Talbot, William Henry Fox; Bayard, Hippolyte; Donné, Alfred, Foucault, Jean Bernard Léon, Fizeau, Louis Armand Hippolyte; and Blanquart-Evrard, Louis-Désiré.

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CONSERVATION AND PRESERVATION

The history of photography has become a well-established and respectable scientific aspect of art history. It is a highly productive field that produces much scholarly work on the lives and works of photographers as well as the impact of photography on art and society. The preservation of photographs has become a matter of concern for societies that appreciate and continue to enjoy photography. Over the past few decades, scientific research has advanced considerably in its efforts to understand the deterioration of early photographs and to find more effective methods of preserving them.

In the United States, the principles of archival processing seem to have been applied at an early stage by the majority of photographers. In Europe, and the rest of the world, the situation has evolved more slowly, perhaps by a lack of information and resources.

World wide however many conservationists such as James Reilly in the United States and Bertrand Lavédrine in Europe have incorporated their scientific interest in photographic conservation, restoration, and preservation. Important museums such as The Getty Conservation Institute; The National Media Museum in Bradford; the Centre de Recherches sur la Conservation des Documents Graphiques (CRCDG) in Paris; the Images Permanence Institute (IPI); a part of the Rochester Institute of Technology; The Harry Ransom Humanities Research Center in the University of Texas at Austin, Texas, USA all provide a foundation for the development of new tools to address the causes of deterioration of photographic materials. Their work also includes the development of new treatment and preventive conservation strategies for these materials. Because of their work in preservation, photographic collections with images from the nineteenth century can be appreciated today, serving as an integral part of our collective heritage and memory.

Individual pioneers of conservation were Ian L. Moor and Angela H. Moor from the Centre for Photographic Conservation (London), Etsuo Fujii and Hideko Fujii (Tokyo) and Roger Kockaerts (pH7 Center, Brussels). The foundation pH7 was establsihed in the early 1980s to educate European photographers and museum staff on existing photographic conservation techniques. At that time photo conservation, as seen by the majority of the photographic community, was still in its infancy although its principles referred to the findings of the scientific committees of the 1850s, organized by the Photographic Society of London and the Société française de photographie in Paris.

Fortunately much of this pioneering work was published in photographic journals such as the early issues of the *Photographic News*, *Photographic Journal,* and the *British Journal of Photography*, and their

counterparts in other European countries and the USA. The Photographic Society (precursor to the Royal Photographic Society) was dominated by photographic scientists who found it a vital forum for mutual exchange of information and constructive criticism. Of the many photographic issues discussed by this group and the Linked Ring, the Société française de photographie in Paris and Secessionist Movements was the issue of conservation and preservation.

A brief inspection of nineteenth century scientific work proves that many scientists were interested in photography and made significant contributions in conservation or other related fields as a means to solve the problem of deterioration. It is unfortunate for the present day researcher in these fields that few of the actual photographs exist to serve as scientific records. The fading of prints was one of the key problems of early photography, with the Photographic Society of London setting up a committee on the subject in 1855. Surprisingly the committee came up with some highly pertinent recommendations, suggesting the prints be thoroughly washed with gold toning. Two French investigators, Alphonse Davanne and Jules Girard, conducted detailed and exhaustive scientific investigation of the process, and their study, published the same year, emphasized the importance of using fresh (sodium thiosulphate) fixer. Albumen prints however created new problems. Their thicker coating was relatively impermeable, and it proved difficult to completely wash out the chemicals. One of the favorite methods used in the early years for gold toning—the sel d'or (gold salt) method—mixed an acidic gold solution with the fixer, but often caused the decomposition of some of the fixer, which produced sulphur that could not be washed out. This was a major cause of print fading. A move to separate toning in alkaline gold solutions (first introduced by James Waterhouse around 1855) before fixing in fresh hypo produced significantly more stable prints. The kind of rapid fading that had often been a problem with the earlier salt prints and albumen prints largely became a thing of the past as Alkali gold toners deposited more gold, helping to protect the image. All nineteenth century albumen prints show some evidence of yellowing, but in a few cases it is relatively slight and only noticeable if the print is compared to a white paper surface.

As photography entered an age of more sophisticated and comprehensive knowledge about collections of photographs, the need for specialists in both curators and conservationists increased. Attention was paid to the methodology for the isolation and evaluation of problems with deterioration and specialists focused their analyses and prioritization on determining the eventual solutions, which were applied or adapted to them.

The issues concerned with the conservation and preservation of nineteenth century photographs are still not fully understood, and this remains an important area of scientific research. In addition to ensuring the long-term survival of the originals, the challenge of digitising early photography so that it remains available for study, are huge.

Photography had to wait almost a century and a half before scientific studies on complex chemistry of early materials, and the effect on them of environmental conditions, had advanced to a level where the inter-relationship of many diverse factors involved in image deterioration where understood. In recent years, many important research projects have identified the very different chemical processes involved in apparently similar materials. This has resulted in a much sounder understanding of the effects of time and environmental impact on different papers, films, and plates. Only relatively recently have conservators been able to establish and create optimum storage conditions.

It was not until 1989, exactly 150 years after the invention of the medium that, in addition to the many albums that were titled "the world history" of photography, excellent monographs emerged resulting from patient research in often difficult circumstances. Remarkable essays studied development, revealing little known or concealed facts. The history of photographic representation, however, was a controversial field that played an important role in the scope of photographic records. Today, conservationists see themselves confronted with a shift regarding the conditions of traditional historical research. Because photography captures a moment in time, that moment will exist as an artifact of the time it was taken. This image then functions as a tool for referencing that time period thus shaping our understanding of that time period. Historians though, can only access this history if the image exists and therein is the fact that its history is only possible as a result of future interest in the medium and the conservation and preservation of the image. Walter Benjamin stated that we should rethink photography and history altogether, because what transforms an event into a historical event is its technical reproducibility (the photographic recording of it). The language of photography memorializes history and at the same time expands the significance of photography. More than ever though, this history of photography remains ambiguous.

To help establish a comprehensive history of photography, conservationists and preservationists address the primary issues of: modes of decomposition of photographic materials; carriers, binders, image forming materials, the effects of specific pollutants and moisture in decomposition and biological attack; enclosures; advantage/disadvantages of various types of construction materials, and selecting specific materials for specific purpose such as cracked glass plates; storage; relative humidity and temperature, freezing, acclimatization,

rack systems, airflow, and desiccants. Secondarily are the issues like photographic identification, repairs and consolidation, compensating for loss, surface cleaning, humidification, and flattening of the image.

Important also in conservation and preservation of are the contemporary photographers who have revived the nineteenth century photography processes in trying to make photographs like them. Many of these alternative processes are historical methods of photographic printing based on the light-sensitivity of certain salts of iron, rather than silver which is the industry standard. Iron based processes are named according to the substance of the image, which may be a noble metal such as platinum (platinotype), palladium (palladiotype), gold (chrysotype) or silver (argentotype), or a pigment such as Prussian Blue (cyanotype). These alternative processes require hand-sensitized papers instead of any commercial photographic product, and are noted for their tonal beauty, individuality, and archival permanence. Their practice is therefore now of value chiefly to fine artists using photography, who through the use of these processes gain aesthetic control over important visual characteristics like color and texture of the paper surface. These photographers who revived these processes in the 1970s were obliged to use formulae from the nineteenth century, as there had been little progress in improving them since their invention. Michael John Ware is representative as an independent researcher, author and photographic artist who has been researching, teaching and improving these processes whenever possible to understand their underlying photochemical science, to improve their technology with modern materials, to publish his findings, to impart skills through practical workshops and to assemble a body of work for exhibition in order to highlight the special qualities of these early media for a wider public. The updating of the analogue photochemical science of the historic iron-based processes and re-creation of photographic methods establishes this vital art as contemporary and keeps its rich heritage from being lost or forgotten. Such innovative work also helps the professional restorers with their work in museums and other facilities.

One of the nineteenth entury's approaches is characterized by a departure from reality that renders an alternative reality from a very specific angle/perspective as a result of the photographic technique and design it employed. For instance there are myriad photographs from the nineteenth century of people with stern expressions, however to discern a historical reality from these images would be in fact a mere a assumption based upon the circumstances of photography. In particular, the processes that are typical of the medium of photography such as repetition, paradox and the gap between actual reality and its representation often reoccur. This emphatically visually oriented photography is characterized by a certain degree of alienation from reality as the latter can be perceived and often stands out by its markedly illusory character.

A photograph may be historical, academic, research, curatorial or administrative, but does not function exclusively as one or another. We tend to overlook the fact that photographs, which support scientific experimentation, may also be historically important images, or may represent the first use of an innovative photographic technique. If presented in a manner, which strips away prejudice for an exclusive use and function, photographs can provide a rich resource for all kinds of users with all types of needs.

Another goal, which digitisation and the development of comprehensive illustrated catalogues are designed to establish, is the widening of access to early photographs. One of the most pressing issues in photographic collections management is the paradoxical desire for increased use on one hand, and preservation of the objects on the other. Every reference aid reduces the need to handle multiple images and acts to preserve individual items and collections. Directories assist researchers in their assessment of a collection before locating the images themselves, and thus to preserve those unneeded photographs from unnecessary handling.

Directories also provide the information gathered about each collection details its purpose, organization, storage facilities, procedures, and current use and allows a thorough, easy and efficient investigation of the collection function.

There is perhaps another basic reason that the wide spread of conservation and preservation (imaging technology) have been delayed. In addition to the needed scientific knowledge in chemistry and optics, preservationists and conservationists need an understanding of commercial and business practices of the times in order to fully understand the importance of certain images. Needed as well is an ability to sift through and evaluate patent information for significant details that are not specifically referred to, but only suggested. Research as well may be difficult and require pairs or teams of workers to complete. Without a comprehensive understanding and appreciation for nineteenth century photography, not only as an art, an artifact, but also as a science critically limits its potential for growth.

Those interested in creating unified collections of nineteenth century images are doing more than protecting photographs. Conservationists and preservationists all attempt to:

- keep together the original collection with a international value, making it available to the public by means of commercial and non-commercial use;
- expand its contents by collecting documentary photo collections which otherwise would not be kept in

record in the originating country and which in that case probably would be lost and/or which are supplementary tot the original collection;
- preserve a historical document which formed a part of the cultural-historic memory, not only of the own country, but also of the rest of the world:
- bring forward and emphasize the photo historic value, which during the days as company archives hardly played a role.

Keeping the collection together as a whole has increased the value of the photographs, which goes beyond the value of the individual photo. The collection is a source of information on mass culture in the nineteenth and 20th century as seen by well-known photographers as well as an even greater number of anonymous photographers. This enables future generations to understand how people saw at their surroundings. Such collections have been preserved and can now be accessed and used in quite different ways than originally intended. The versatility of such collections allows photography to expand its application than in the days the photos originally were published and shown. Institutions and museum use their collections as a source of inspiration for many.

The conservation of the photographs has developed from not existing to the present standard of being critically needed due to the cooperation of experts and photographic conservationists. This conservation runs parallel to the increase in knowledge of photo-conservation in the past decades. It is also due to our culture's vast interest in these the collections, which have required specific solutions for conservation on a mass scale.

During recent years initiatives like the ICOM-conference has made an important contributions to the preservation of the photographic memory. The ICOM committee for conservation held the 14th Triennial Meeting in 2005 in The Hague (the Netherlands).Without its vast collections and many unique photographs the photographic collection of the world would be less saturated. In response to the regional need for training professionals in the field of photographic conservation, a series of mid-career photographic conservation training workshops were organized in Australia. These workshops were funded by the Getty Grant Program and organized by PHOTON, the photographic special interest group of the Australian Institute for Conservation of Cultural Materials (AICCM). These workshops targeted conservationists and cultural heritage professionals in Australia and the surrounding region.

Archives, museum and institutions are contributing to make the public aware of the values of the photographic memory to the community. Its collections are not only of interest to (photo)historians, but are used to stimulate students, artists, designers and serve educational purposes. With this in mind more and more conservationists and restorers are working together with researchers in the field of photo history and with culture, state, and municipal archives, as well as with other institutions, professional and amateur photographers, social organizations, the business community, designers artists and teachers.

Many archives consider the production of temporary exhibitions as an important part of its activities. It enables the public to see photography from constantly changing perspectives. This may range from creating a feeling of recognition of portraits of landscapes, to public debates about the use of photography and its impact as well.

By making photographic collection available in so many ways, institutes have made archives into dynamic experiences. By the daily use and growth of digital photography, reproductions have been easily made in recent years for (photo)historic research, exhibitions, and publications like books, newspapers, magazines, cd-roms, DVDs, commercials and advertisements, school materials, television and film, and the institute's wide and various audience. The expansive use of archives makes nineteenth and twentieth century photographs part of the twenty-first century. The collections also contain international pictures, help establishing an international concept of the world in earlier centuries.

In 1992 a conference on photographic conservation was held at Windemere, Cumbria, England. More than 150 delegates representing 15 different countries from all over the world attended the Conference The Imperfect Image—Photographs, their Past, Present and Future. It was organized by the Centre for Photographic Conservation based in London and directed by Angela and Ian Moor, two of the most influential conservators in the field.

This Conference 92 was divided into five sections, and there was an accompanying poster exhibit. Section one was Photographic history, processes and applications; section two was Photographic collection management; section three: preservation and conservation research; section four: conservation and restoration and section five: photographic conservation training. This conference was an important meeting for scholars that celebrated surviving images while drawing attention to the degradation of countless others.

Many institutes, archives and their researchers/restorers as well as artists have contributed to the proliferation of knowledge about photographic conservation and preservation. Members of these institutions share their experiences with other conservationists, allowing free exchange of information. Focused on as well are the great number of photographs that stimulate the debate about more efficient ways of conservation. These institutions cooperate with the scientific centers also concerned

with photographic conservation and preservation like the Getty Conservation Institute.

JOHAN SWINNEN

See Also: Darkroom and Developing Chamber; Photomechanical: Minor Processes; and Positives: Minor Processes.

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CONSTABLE, WILLIAM (1783–1861)

William Constable, a man of many talents who opened one of the first provincial daguerreotype studios in England. Constable was born in Horley, Surrey, the son of a flour miller. After a brief formal education, he began working life with a draper, Henry Browne, who encouraged Constable's artistic and scientific interests. Following a tour of North America with his brother (1806–1808), he returned to Horley Mill, which he helped restore and operate. By 1816 when he married he was an established surveyor and Civil Engineer. He embarked on further visits to America in 1837, returning in 1839 when he became interested in the 'New Art' of photography. Now based in Brighton, he began negotiations with Richard Beard who owned the English patent rights to practise daguerreotype photography. Constable's `Photographic Institution,' opened on the 8th November 1841, was one of the first daguerreotype studios outside of London. Constable's reputation was firmly established following a visit from Queen Victoria's consort, Prince Albert, in March 1842. Members of the court and aristocracy flocked to his studio. In all, he worked as a photographer for twenty years. Constable died in Brighton and was buried in Horley, the place of his birth.

JOHN WARD

See Also: Beard, Richard; and Daguerreotype.

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CONSTANT, EUGÈNE (1848–1855)
French Photographer

Eugène Constant was a brilliant and innovative French photographer who produced views of Rome that are unique, particularly with regard to their manufacture. As early as 1848 Eugène Constant sent to Paris some excellent positives printed from albumen negatives taken by him personally in Rome. Yet he still remains a mystery. He used the calotype, then became one of the first in Rome, if not the first, to use the new albumen on glass negative. He lived Rome 1848–1855, then disappeared. He exhibited Society of Arts, London 1852, Paris 1857.

No one of the period seems to have produced so consistently the same texture, the precise quality of the printed mark, not simply with regard to tone, often a soft pink, but in relation to the specific *granular* construction of the printed silver solution, which resembled an etching as distinct from the soft, often blurred tones that were characteristic of the early albumen experiments. As such Constant was able to bring out the quality of the Roman ruin majestically, such as his 'Temple of Castor, Rome, from the West' or 'The Arch of Titus,' or 'The Arch of Septimus Severus.' These prints were probably made from albumen glass negatives as distinct from wet collodion. They are comparable with some early prints by the Scottish photographer Robert Macpherson who was to eventually use the rarely used collodio-albumen dry plate negative, invented 1855. He had commenced with the albumen negative in 1851. Constant's work displays perfect composition, a delicacy; small, petite, exquisitely refined—all photographs display some aspects of the photographer's character. They are decidedly French. He controls the light perfectly, as if it were paint; the light alternating precisely with the shadows.

Eugène Constant was part of the foreigners art scene in Rome that congregated round the Caffè Greco where many visitors also came to talk to the artists and obtain invitations to visit their studios. The French would appear to have formed the first significant group of photographers: along with Constant were Jean-François-Charles André (1813–83), known as Count Frédéric Flachéron, sculptor, lived Rome 1839-1867, originally as a Prix de Rome at the French Academy. He commenced with the calotype in 1847, Prince Giron des Anglonnes, lived Rome 1850–52, perhaps also Alfred-Nicolas Normand (1822–1909), a Prix de Rome architect arrived 1847 took up the calotype, producing prints dated 1850–52, and Louis-Alphonse Davanne (1824–1912). It is probable that the interest in photography began as a gentleman's pursuit, a side show originally to painting, during the daguerreotype and calotype processes, and although they produced excellent work, mostly using Louis-Désiré Blanquart-Evrard's (1802–72) improved calotype formula and his new albumen paper, and then the albumen on glass negative, they did not become successful commercial exponents.

Some did try to make photography pay, just as in painting, but how much of a business is still difficult to tell. Count Flachéron, as Flachéron-Hayard, using his married name, attempted to run a business and also sold work by Robert Macpherson (c. 1856), Eugène Constant sold his prints, mounted on card, inscribed with an embossed stamp of 'Eugene Constant,' and on the mount the monogram EC, at the shop of Edouard Mauche, Via del Corso 174, along with other French photographers.

One reason for the fading of such as Constant's brilliance was the political and economic blight in the 1840s to 1870 which drove the collectors from Rome. The artists' studios gradually began to disappear. They no longer came for several years at a time; the migration to Paris had begun. In later years the abandoned artists' studios made excellent photographic studios and darkrooms for the thriving trade that catered, post-1870, for a different kind of tourist. All were never to be heard of again in their time. The new formula for success in the mass market was to be the denial of the photographer as personality; companies could now employ many photographers and few would notice the difference between one photographer's product and another.

ALISTAIR CRAWFORD

See Also: Albumen Print; MacPherson, Robert; Calotype and Talbotype; Davanne, Louis-Alphonse; and Blanquart-Evrard, Louis-Désiré.

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CONSTANTINOU, DIMITRIOS (active 1850s–1870s)

Dimitrios Constantinou was known as the second pro-

fessional Greek photographer of the nineteenth century. He set up, his first studio, in 1858, in a central road of Athens (Aiolou Street 925), only to move it some years later, between 1865 and 1875, a few blocks closer to the New York Hotel. In 1859, Constantinou participated in the 1st Olympiad (held in Athens) where he was awarded a silver medal for his excellent depictions of classical Greek antiquities; after this distinction followed many others as he took part in numerous exhibitions in Greece and abroad such as the International Exhibition in London (1862) and the Exposition Universelle in Paris (1867).

Constantinou was also known as the first photographer to have collaborated with the Greek Archaeological Society; his task was to document the archaeological work that Greece had undergone during the last two decades of the nineteenth century. For this purpose, he photographed the most important monuments of Athens such as the Acropolis, the temple of the Olympian Zeus, the Tower of the Winds and the Theseion. One could characterize Constantinous' images as beautiful, but at the same time conventional, satisfying the taste of the eager market of the nineteenth century. A closer examination of his photographic work will reveal his austere and scholarly approach to the sites produced by the photographer's interest in the archaeological as opposed to the picturesque details of the antiquities.

ALIKI TSIRGIALOU

CONTACT PRINTING AND PRINTING FRAMES

Contact printing is a method of making a photographic print in which the negative emulsion is placed into direct contact with the sensitised material (usually paper) and exposed to either daylight or artificial light. Contact printing was the principal means to make multiple copies from either paper or glass negatives until the development of and widespread use of solar enlargers from the early 1860s and reliable artificial light sources allowed for more convenient enlarging to be undertaken.

The most basic form of contact printing pre-dates photography with objects being placed into direct contact with a piece of silver-sensitised paper. Talbot's photogenic drawing process was essentially a contact process as was Herschel's cyanotype process of 1842. The salted paper prints were also made by placing a negative directly into contact with a piece of sensitised paper. These processes and many other processes all made use of daylight to create the image.

Contact prints were made on albumen paper with daylight as the exposing light source which gradually gave way to gelatine printing-out papers, usually silver chloride based. Ilford Ltd coined the word printing out paper (POP) and introduced it in 1891 and Kodak produced their own version under the name Solio from 1892. The introduction of silver chloride papers under the colloquial name of gaslight papers which came in a variety of contrast grades (Kodak produced their version under the name Velox) could be handled under subdued illumination and exposed by use of gas or electric illumination which made them eminently suitable for amateur use. As a consequence the printing frame saw a resurgence of use from the 1880s onwards.

To facilitate contact printing the photographic printing frame was an early feature of photographic darkrooms and outfits from the 1840s onwards. The printing frame allowed the negative and receiving sensitised material to be held tightly together often with some means of inspection without disturbing the register of the two during exposure.

The printing frame was also called the reversing frame or pressure frame. All contemporary writers stated that two sheets of glass clipped together would act as a printing frame but recommended the French form of pressure frame that "opens at the back, in order that the progress of work may be examined from time to time. It is rather expensive, but very convenient, and many blunders will at first be avoided by the use of it." (Thornthwaite,1853). Frederick Cox his *Compendium of Photography* (1866) stated: "After taking the Negative on glass, a pressure Frame is required to produce the paper copies: they are made of various sizes, one sufficiently large to take the Negative with a small margin around it, is recommended; and the back-board should be jointed." Photographers using printing frames were cautioned about over-tightening pressure screws which could cracked the cover glass or more disastrously the glass negative.

There were variations in design. Frame for printing from paper negatives, Calotype or waxed-paper, generally had a glass plate behind which the two pieces of paper were mounted. Those for printing from smaller glass negatives did not and the glass plate set into a rebate in the frame acted against the sprung back to maintain close contact. Some frames were designed to hold two or more negatives with the cheaper models holding just one. In 1860 a superior pressure frame with pressure board hinged in two places was sold for 2s for a 6½ × 4¾ inch model and 16s for a 12 × 10 inch model. Frames were available in oak or mahogany with the latter being slightly more expensive. Bland & Co. in 1863 were offering an Improved Pressure Frame in mahogany in nine sizes from 13s 6d for a 9 × 7 inch model to £2.15s.6d for a 25 × 23 inch model and altogether offered thirty-three different styles in their catalogue.

The basic design of printing frames changed little through the century. The earlier back pressure screws gave way to spring metal clips and the sizes of frames,

Chauvassaigne, Frank. Seated Nude in Studio.
The Metropolitan Museum of Art, Purchase, The Horace W. Goldsmith Foundation Gift, 1998 (1998.338) Image © The Metropolitan Museum of Art.

at both ends of the scale, expanded to cope with printing from the various sizes of roll film negatives available by the end of the century. Specialised frames were also introduced to cope with particular processes.

In 1900 Houghtons Ltd., one of Britain's largest photographic manufacturers and retailers, carried seven pages of printing frames plus one of printing frame accessories listing over eight-five different types of frame. These ranged from pine models, ordinary teak frames in 'good' and 'best' quality in sizes from 3½ × 2½ inches to 15 × 12 inches plus Continental sizes; white wood frames, and a series of frames for roll film negatives from 2 1/8 × 1 5/8 inches to 3½ × 3½ inches. Specialised printing frames for stereoscopic negatives had been available in the 1850s and remained so in 1900 (sometimes called transposing frames). Frames were also available for printing opals and lantern slides and for making Bromide prints on to rolls of sensitised paper. Accessories included rubber and felt pads for the frames—some flexibility of the frame back was important so ensure perfect register between the two photographic emulsions and to ensure that glass plates did not crack when pressure was applied. Spare springs could be purchased and a print indicator that could be attached to a printing frame which recorded the number of prints taken from a negative.

From the later 1880s and especially into the 1890s patents were granted for a range of more specialised designs some of which saw commercial development. Other designs were registered or offered in manufacturer's catalogues. A very basic design relied on metal clips to hold the glass negative against the sensitised paper and being light weight were intended for touring. Lancaster of Birmingham produced the Triple Pressure Frame that allowed a print to be inspected from both ends without disturbing registration. The Birmingham Photo Co made a Full View Frame that allowed the whole print to be inspected and also allowed for vignetting and other masks to be attached. Pickard's printing frame was made solely of metal. Specialist opalotype frames reflecting the popularity process in the early 1890s were designed to accommodate dif-

ferent thicknesses of opal glass and glass plates and to keep them in register during inspection. The increased use of vignetting and the growth of the postcard in the 1890s also led to manufacturers producing specialist printing frames. The production of the 3¼ inch square photographic lantern slides from the late 1880s well into the twentieth century was also undertaken by contact printing on to glass where the negative was of the same size as the intended slide, once the glass slide had been exposed, usually in daylight, developed and toned the emulsion side was protected with a cover glass and the edged taped with passé partout.

The printing frame remained an essential part of the photographer's darkroom throughout the nineteenth century. Photographers studios or printing works from the bigger studios such as Elliott and Fry such would often employ large rows of printing frames to produce the volume of prints they required. For the amateur the contact print offered a convenient way of producing prints used limited equipment.

The development of the practice of enlarging negatives and smaller roll film formats did little to dampen their use right through to the 1960s when the rise of low-priced photo-finishing saw a reduced need for amateur photographers to undertake this task. In the later part of the nineteenth century professionals would use them to make proofs and amateurs would use them to make their final prints. Their basic design remained largely unaltered throughout the century with an increasing variety of designs reflecting the rise in the number of photographic processes.

MICHAEL PRITCHARD

See Also: Emulsion; Talbot, William Henry Fox; Herschel, Sir John Frederick William; Cyanotype; Salted Paper Print; Albumen Print; Kodak; Lantern Slides; Bromide Print; Mounting, Matting, Passe-Partout, Framing, Presentation; Elliott, Joseph John & Fry, Clarence Edmund; and Roll Film.

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COPYRIGHT

For twelve years after Daguerre and Talbot announced the invention of photography, its products were of relatively limited application and difficult to reproduce. With the invention, though, of the wet plate collodion process it became much easier to produce multiple copies of images, and commercial exploitation through such media as *carte-de-visite*, stereo cards and cabinet prints rapidly followed. Photography became a profitable business, but competition was fierce and the product needed protection from illicit copying by those wishing to have a share but unwilling or unable to make the necessary investment. Photographers needed the protection of the law, and the answer lay in copyright.

In the United Kingdom, limited protection was available, it is true, through the common law, but only to the photographer himself and only while the work remained unpublished. That was of little practical use to commercial firms. Statutory copyright protection was given to sculptures, to maps, charts and plans (as books) and to engravings and prints (including lithographs), but none of this was apt for the protection of photographs. In 1857 the Society of Arts, which four years earlier had helped the foundation of the Photographic Society, drew attention to the serious defects in the law which left painting, drawing and photography largely unprotected. The Society began lobbying for a new statute, with active support (directly through the Society's Artistic Copyright Committee, or indirectly through articles in the artistic press) from notable figures such as Roger Fenton, Henry Cole and Francis Frith. It faced fierce opposition to the proposal to cover photographs notably on the grounds that they were mere mechanical reproductions, not true art, but ultimately commercial and diplomatic imperatives led the government to act.

In 1862, with a new Great Exhibition looming at which it was hoped that overseas photographers would exhibit, Parliament passed the Fine Arts Copyright Act. This gave protection against copying to the authors of paintings, drawings and photographs, whether published or not, with a requirement that they be registered at Stationers' Hall before the protection was enforceable. The statute as it dealt with photographs was not tested until 1883. That first case remains, even in the twenty-first century, of importance because it defined as the author of a photograph the person who was 'the inventive or master mind' behind it. In subsequent cases commercial photographic companies were found to own copyright in portraits they took only if they had solicited the sitting and the sitter had not paid for the pictures taken.

In America, Congress was not far behind. Since 1790, acts had given copyright protection to 'the author or authors' of books, maps, prints, engravings and musical works, so long as works were registered in district courts (from 1870 in the Library of Congress). In 1865, an amendment Act was passed to extend these provisions to photographs, 'upon the same conditions as to the authors of prints and engravings.' Unlike in the United Kingdom, though, the American provisions had to conform with a written constitution, which allowed protection only for 'writings,' so the act faced a challenge. The Supreme Court concluded in 1884 that

a photograph was a writing, and so could be protected, but only if the photographer had created an original intellectual conception of which he could be considered the 'author.' Napoleon Sarony's images of Oscar Wilde passed the test with ease but some photographic circus posters later failed. One further problem remained: the United States approach was heavily protectionist, and until 1891 works by non-resident authors, including photographers, could be pirated with impunity.

In the United Kingdom and America, statutes explicitly gave copyright to photographs. Countries in the civil law tradition followed a different route. By the law of July 1793, the National Assembly of France gave exclusive rights to 'les auteurs d'écrits en tout genre, les compositeurs de musique, les peintres' and others to sell and distribute their works in the Republic. Following this lead, albeit slowly, other countries gave authors of at least some artistic works varying degrees of protection against copying: Prussia in 1837 for drawings and paintings, Austria in 1840 for unspecified works of art, Spain in 1847 for paintings and sculptures. No-one knew though whether these laws applied to photographs: was a photograph a work of art? It was not until November 1862 that the courts in France concluded, in a case brought by the *carte de visite* company Mayer and Pierson, that it could be, so long as the author had invested his own personality in the work and had not merely used a machine to reproduce nature. The Belgian courts followed a similar route, but many European states, notably in Germany and Scandinavia, regarded photographs as purely mechanical products deserving only very limited protection.

Protection in countries other than the photographer's own was provided until 1886 by bilateral treaties. This caused problems for trade, since provisions varied so widely and protection was available only if a treaty had been agreed. The Berne Convention brought an international system of protection, though its value was much reduced by the absence of the United States which continued to rely on bilateral treaties. Moreover there was no agreement on photographs, which were not mentioned in the main text at all but only in a protocol. Some countries (such as the United Kingdom and France) accorded photographs the status of artistic works, while others (led by Germany) declined to do so. The solution to these differences was a compromise which permitted both approaches, but it was inequitable in its effect. A state that recognised photographs as artistic works was obliged to follow the basic Berne principle of granting protection under its national law to works created by citizens of any member state of the Berne Union, but no reciprocal protection was available for their citizens in countries which did not treat photographs as artistic. This problem was not finally resolved until well into the twentieth century.

The Berne Convention was signed by only ten countries, Belgium, France, Germany, Great Britain, Haiti, Italy, Liberia, Spain, Switzerland and Tunisia, but its effects were more widespread than this small membership implies. Japan, for instance, recognised photographs as artistic works the year after it was signed and the colonies of Britain and France mostly adopted the copyright laws of their mother countries. By the end of the century, most commercially active photographers knew where they stood in the countries with which they dealt, even though the protection they were able to enjoy varied hugely.

TIM PADFIELD

See Also: Daguerre, Louis-Jacques-Mandé; Talbot, William Henry Fox; Fenton, Roger; Cole, Henry; Frith, Francis; Sarony, Napoleon and Olivier François Xavier; and Mayer & Pierson.

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CORNELIUS, ROBERT (1809–1893)
Pioneer daguerreotypist and businessman

Robert Cornelius was born in Philadelphia on 1 March 1809, the only son of Christian Cornelius to live to adulthood. Christian had worked as a silversmith before establishing himself as a successful lamp and chandelier manufacturer. Robert's name first appeared in a 1835 Philadelphia business directory listing his occupation as

a brass founder. Shortly thereafter he joined his father in the lamp business. Cornelius & Co. became one of the largest importers of gas lamps in the country, providing fixtures for the U.S. Capitol in Washington, DC, as well as other state capitols and public buildings.

Robert Cornelius was one of the first Americans to experiment with the daguerreotype process. Details of the process were available in the United States one month after Louis Jacques Mandé Daguerre's announcement of his invention to the public in Paris on 19 August 1839. Already a center for scientific research, Philadelphia was home to many people who experimented with the daguerreotype process. Cornelius adapted skills from the lighting business—polishing metal and plating silver—to the practice of making daguerreotypes. His interest in the daguerreotype may have been stimulated by the hard economic times of the early 1840s that followed the financial panic of 1837 when a lag in business would have afforded Cornelius time to experiment with this new photographic process.

In September or October of 1839, Joseph Saxton, an employee of the U. S. Mint and pioneer photographer, asked Cornelius to produce silver-coated copper plates for his daguerreotype experiments. After this request, Cornelius began to make his own daguerreotypes, fashioning a camera from a tin box and an opera lens. In October or November of 1839, he made a self-portrait that is considered one of the marvels of early photography. Working outdoors in sunlight to minimize exposure time, Cornelius placed his camera on a sturdy support, removed the lens cover, sat still for several minutes, and then replaced the lens cover. The resulting daguerreotype shows Cornelius slightly off-center with his hair askew, eyeing the camera warily. Considered the earliest extant photographic portrait in America, it is in the collection of the Library of Congress.

Cornelius set the earliest standard for daguerreotype portraiture in America. In May 1840, he opened one of the first daguerreotype studios in Philadelphia, along with his partner Paul Beck Goddard, a chemist at the University of Pennsylvania. At a time when many people thought daguerreotype portraiture was impossible, Cornelius produced sixth-plate daguerreotypes with a camera that used a short, fast lens. Goddard improved the daguerreotype process by using bromine in addition to iodine to sensitize the plates, which allowed portraits to be made in a matter of seconds rather than minutes.

The Cornelius studio, on Eighth Street, above Chestnut, Philadelphia, had a southern exposure. A large mirror attached horizontally to one of the windows reflected light onto another mirror set at an angle to illuminate the sitter's face. A piece of light purple glass suspended from the ceiling softened the light. Typically, Cornelius's sitters faced the camera directly. Using this system, he produced evenly lit, bust-length portraits. An article in the 5 September 1840 *Botanico-Medical Recorder* provides a description of a portrait sitting in the Cornelius studio:

> "... as it is only necessary to sit about a minute; till the sun has, by his powerful pencil, transfixed every lineament of your features, with all their beauties and blemishes, in imperishable lines upon the plate of silver." Cornelius's early portraits were devoid of props, but later sittings include a small table used by sitters as an arm rest.

Leading Philadelphia businessmen and scientists patronized the Cornelius studio, paying five dollars per portrait. Cornelius photographed the scientist Martin Hans Boye several times over a two-year period producing unusual studies, including two portraits of Boye reading a book, and images showing Boye conducting scientific experiments. These portraits show a mastery of the daguerreotype medium.

In addition to portraits, one street scene by Cornelius is known to exist. His view of Eighth and Market Streets, Philadelphia, made circa 1840 is remarkable for its early use of a mirror or reversing prism to present a laterally correct image. (Early daguerreotypes produced mirror images of their subjects.)

Early Cornelius daguerreotypes can be identified by their atypical heavy, brass frames that may have been made in his family's lamp factory. These pieces frequently have a paper label with Cornelius's name and address attached to the back of the object. Cornelius developed a metal support for his plates which was recessed to hold the daguerreotype plate and had a rim to hold the cover glass above the plate. Later Cornelius daguerreotypes are housed in traditional cases, usually with an overall floral design, and brass mats stamped with his name.

Cornelius, along with fellow Philadelphia daguerreotypists Paul Beck Goddard, Joseph Saxton, and Walter Rogers Johnson, received recognition for their achievements with the daguerreotype process in local newspapers and at the meetings of the American Philosophical Society and the Franklin Institute. As early as 6 December 1839, Cornelius showed his daguerreotypes at a meeting of the American Philosophical Society in Philadelphia. Knowledge of Cornelius's daguerreotypes was not limited to the United States. Writing from England in 1843, John Egerton's preface to the translation of Noël Marie Paymal Lerebours *A Treatise on Photography* states that "he remembers seeing, about two years ago, the most beautiful specimens of the Daguerreotype then in existence, produced by Mr. Cornelius, of Philadelphia, ..." The plates Egerton saw were most likely portraits of Philadelphia wigmaker Augustus Gallet that were sent to France to demonstrate America's prowess with the process.

Although Cornelius closed his daguerreotype studio

in 1842, he made a few portraits after this date. After the use of residential gas lights had become popular, Cornelius returned to the family lamp business where he continued until he retired in 1877 and turned the business over to his sons. During retirement, Cornelius operated a fruit farm near Frankford, Pennsylvania.

In 1876, Marcus Aurelius Root, a former pupil of Cornelius's organized a historical display of photography for the Centennial Exposition. The Cornelius self-portrait was included in this exhibition. Cornelius exhibited his lighting fixtures at the Centennial, and most likely saw the photography exhibition.

Fewer than fifty daguerreotypes by Robert Cornelius are extant. Among the institutions that hold his work are the Library of Congress, the International Museum of Photography and Film at the George Eastman House, the Library Company (Philadelphia), and the American Philosophical Society, as well as several private collections.

Carol Johnson

Biography

Genealogical information about Robert Cornelius's mother is very limited. According to a family member, Christian Cornelius was married three times, first to Anna Buck, then Sarah Jackson. He was survived by Sarah McGowan. Robert Cornelius was born on 1 March 1809 in Philadelphia. He married Harriet Comly (spelled Comeley in *History of the Cornelius Family in America*) in 1832. They had eight children, three sons and five daughters. Cornelius spent most of his career working in his family's lamp business. He was awarded several patents for improvements to gas lighting. Cornelius operated one of the first daguerreotype studios in Philadelphia between 1840 and 1842. His studio attracted both portrait sitters and people interested in viewing the daguerreotypes that were on display in his gallery. His rare portraits are celebrated for their mastery of the daguerreotype process. Cornelius died on 10 August 1893 at the age of 85.

See Also: Daguerre, Louis Jacques Mandé; Saxton, Joseph; Goddard, Paul Beck; Johnson, Walter Rogers; and Root, Marcus Aurelius.

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COROT, JEAN-BAPTISTE CAMILLE (1796–1875)

An accomplished landscape painter and draughtsman

Jean-Baptiste Camille Corot was also the most important practitioner of cliché-verre in the nineteenth century. Introduced to technique in Arras in 1853 by the painter/lithographer Constant Dutilleux, Corot created at least fifty clichés-verre between 1853 and 1861 and produced another sixteen in the early 1870s. He experimented with several techniques, including *tamponnage* (tapping the glass negative with a stiff brush to create texture). Most of Corot's clichés-verre are rapidly sketched landscapes, some with figures, although he also completed several large, complex works that exist in several states, such as *Le Songeur* (illus.).

Drawn to the fluidity and relative freedom of the technique, Corot left the complex chemical manipulations of printing from the negative to his colleagues in Arras, including Dutilleux, Adalbert Cuvelier, Léandre Grandguillaume, and Charles Desavary, who printed most of Corot's clichés-verre after 1858. Though he generally made salt prints, in the 1870s Desavary made some prints on albumen paper. Desavary also experimented with making reductions and countertype impressions from Corot's glass negatives. Between 1911–1913, the amateur photographer Albert Bouasse-Lebel attempted to make prints from about fifteen of Corot's negatives acquired from Cuvelier; most are characterized by untrimmed edges. These negatives were then acquired by Parisian editor Maurice le Garrec, who reprinted them in 1921 in an edition entitled *Quarante Clichés-Glace.*

Sarah Kennel

COSMES DE COSSÍO, ANTONIO L. (b. 1820s)

Antonio was the son of Antonio Cosmes, a Spanish officer, and Guadalupe de Cossío, his well-connected Mexican wife, was one of a number of daguerreotypists active in Mexico during the Mexican War (1846–1848), and is considered to be the first native Mexican to have practiced the trade. Cosmes was initially associated with the American C.S. Betts who had a studio in Mexico City. In January 1848 Cosmes announced his break from Betts and the opening of his own studio at calle San José Real #5, and advertised his specialties as a miniaturist and colorist. One of Cosmes' first commis-

sions was to document the estate of Hernán Cortés for its current heir. By 1852 Cosmes had moved to Spain and opened a studio in Cádiz, where he had a versatile practice, specializing in miniatures, ambrotypes, and stereographs. He colored the portraits himself, and, in 1859, announced his discovery of a new method of tinting them via chemical baths.

In May of 1858 Cosmes partnered with José Martínez Sánchez, a Madrid photographer, to record the arrival of Queen Isabel II at the port of Valencia, en route to Alicante for the opening of the new railway. Their views of the historic occasion are considered to be the first instance of narrative photographic reportage of an individual news event. As official photographers of the event, Cosmes and Martínez Sánchez were situated at the port well in advance of the queen's arrival, and were thus able to record the entire event from the preparations for her reception and the crowds awaiting her arrival to the appearance of her accompanying squadron, the royal's trip to shore, and their return to their ship for lunch the following day. While waiting for the Queen, who had been expected early in the morning, the photographers made was is believed to be the first photograph of dawn taken in Spain.

Beth Ann Guynn

COURBET, GUSTAVE (1819–1877)
French photographer

As it was the case for most artists, the relationship between Gustave Courbet and photography was two-fold. He used it as a model for his paintings and to promote his work. Contrary to others, Courbet made no secret of it. Those practices were directly related to his art conception, according to which, art is democratic. For thirty years, it was known that Courbet used Vallou de Villeneuve's photography as a model for his feminine figures. Realism art critics accused him of dirtiness and of photographic truthfulness. Théophile Gautier, for instance, trashed "the ugliness of [the] daguerreotype" (Salon of 1850–1851). It was with Realism and a realistic representation that Courbet felt he was most able to effectively object to the academic model of both photography and painting.

Photography also helped him to promote his work. From 1850 to 1883, when was published an album of his posthumous retrospective exhibition at the Ecole des Beaux-Arts, Courbet made regularly his painting reproduced by photography with the object of selling and distributing the prints. He knew by the way some of the famous photographers of his time, Etienne Carjat and Gilbert Radoux who became his friends, Victor Laisné, Nadar, Robert Bingham, Pierre Richebourg and Charles Michelez. Thereby, the new democratic medium also served his art ideology.

Laure Boyer

COURT CASES AND PHOTOGRAPHY

Photography's first century was riddled with court cases. Many of them sought to identify photography's role as either an art or a science. If a case centered on photography as an art, then copyright laws were applicable to an image's content. If photography was a science, then its original inventor could patent the process used to obtain the image. Some early photographic inventors choose not to patent their processes to allow the growth of photography; Fredrick Scott Archer was one of these photographers. His wet plate collodion process led to one of photography's first high profile cases: *Talbot vs. Laroche*. William Henry Fox Talbot held the patent for the calotype process, which he patented in 1839 in England. The process required a license in England, whereas the new wet collodion process did not require a license and produced a clearer picture; therefore, it became very popular with photographers. Talbot felt that this new process infringed on his patent.

Talbot's original calotype patent, number 8842, had been granted and sealed in 1841 and was set to expire in 1855. Then in 1851 Archer published his wet collodion process. Talbot asserted that because this process, like his own, involved creation of a negative to make a positive on paper that it infringed on his rights. The threat of litigation hindered many photographers of the time from fully embracing the improved process.

Under pressure from the photographic community, Talbot did relinquish his patent rights for amateur photographers, but did not extend it to professional photographers**.** Talbot still contended his rights included all photographic processes that produced a positive paper print as its finished product. This act brought the ire of professional photographers, who believed that Talbot was standing in the way of photographic progress. On December 18th 1854, the trial of Talbot *vs. Laroche* began. Talbot was seeking damages of 5000 pounds for violation of the calotype patent. In his defense Laroche's contended that, instead of Talbot, Rev. J.B. Reade first published the calotype and that the calotype process was not the same as Archer's process. On December 20th the jury found that Talbot was the true inventor of the calotype process, but that Laroche had not infringed on the calotype patent by using the wet plate collodion process. This decision opened up the new collodion process to photographers, which quickly surpassed its predecessors, the calotype and the daguerreotype. Archer's process also became central to another set of court battles in the United States.

This second court battle tested the validity of the patent process. In July of 1854 James A. Cutting patented three elements of a collodion process called the ambrotype. The patents covered the use of camphor with collodion (No. 11,213), Canada balsam to hermetically seal the image (No. 11,267), and the use of potassium bromide in addition to potassium iodide to make collodion more sensitive to light (No. 11,266). This last patent affected not only the ambrotype process but also the wet plate collodion process. Photographers at the time did not believe that Cutting had originally invented the ambrotype process and instead credited Archer with its invention. As a result, they assaulted his claims and blatantly infringed upon the patents. Many of the photographers who had purchased the right to practice the process legally from Cutting brought litigation against the patent infringers. The most zealous of the patent men was William Tomlinson of New York. He was involved in litigation with many photographers. Most of the cases were settled by the infringer paying a fine rather than having to be involved in a lengthy trial. Included in this group were notable photographers Brady, Gurney, and Bogardus. The photographic community eventually joined together to form a committee whose sole purpose was to fight the Cutting patents. The committee set up a fund to help Charles A. Fredrickson to fight the suit brought by Tomlinson in 1859. The case would last until 1865 when Fredrickson finally decided to no longer legally oppose the Cutting patents.

In the end the patents were not revoked but instead expired. An extension to the patent was applied for, but the patent office denied the application stating that an error had be made in its original issuance.

Copyright protection, as opposed to patent rights, was the issue in the case of *Sarony vs. Burrow-Giles Lithographic Company,* which began in April 1883. In this case the photographer Napoleon Sarony was asking the courts to uphold his copyright protection for an image entitled "Oscar Wilde, No. 18." The Burrow-Giles Lithographic Company contended that photographs were not written works and therefore there was no author to claim copyright. Additionally, the defense stated Sarony's copyright notice, as it appeared on the image, "Copyright, 1882, by N. Sarony," was not valid because it did not state his Christian name. Sarony countered the defense by asserting the photograph was a work of art because the he had directed the pose, costume, and expression of the subject to produce an original image despite the fact the process was mechanical. Painting had been protected under copyright by the law of 1793. In 1865, because of the case *Woods vs. Abbott,* Congress extended copyright protection to include photographs. The court found in favor of Sarony and set precedent for photography to be legally included as a means of artistic and original expression. The defense appealed the decision a year latter, but it was upheld. This case proved that photography could be legally copyrighted and patented and was therefore, both an art and science.

Towards the end of the nineteenth century there were many other court cases that would carry through well into the next century. Especially notable were the court battles involving Eastman Kodak Company. In 1889 George Eastman and Henry Reichenbach filed a patent for cellulose film. The patent was not approved at first because of a patent application for a similar invention by Reverend Hannibal Goodwin. Eastman and Reichenbach were eventually granted the patent in December of 1889. The use of this technology by Kodak led to many court cases between Goodwin and Kodak and later Ansco and Kodak. The cases were not finished until 1913 when the court ruled against Kodak.

SARAH TEMPLETON

See Also: Calotype and Talbotype; Wet Collodion Negative; Talbot, William Henry Fox; Cutting, James Ambrose; Archer, Frederick Scott; and Eastman, George.

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COUTINHO BROTHERS (active 1870s–c. 1905)

The Coutinho brothers established one of the first commercial photographic enterprises on the island of Zanzibar, some time in the 1870s. Probably of Portugese origin, little is known of their lives, and one brother is referred to in records only as J. B. Coutinho. The other

was Felix. A studio in Dar es Salaam in Tanganyika (Tanzania today) was opened a few years later, possibly operated by Felix.

The initial partnership between the two brothers lasted little over a decade, before J. B. Coutinho entered into partnership with A C Gomes & Sons c.1890. Gomes had opened his first studio in Aden before 1869, moving to Zanzibar in the early 1870s, establishing what was probably the first studio on the island. That arrangement was dissolved on 31st July 1897, when the Countinho Brothers started trading together once again.

Their photographs of life in fin-de-siecle Zanzibar were sold singly and in albums, and form an important visual account of the period. When the photographic picture postcard started to gain popularity in the 1890s, Coutinho Brothers cards were produced in great numbers, showing tribal characters and cultures, local fishermen and traders, and the architecture of Zanzibar, all clearly aimed at a tourist market.

At some point c.1905, the brothers went their separate ways, Felix moving to Mombasa in Kenya, and opening a photographic company there, once again producing tourist images and postcards, but this time trading as Coutinho & Sons.

JOHN HANNAVY

COX, JAMES (1849–1901)
Scottish painter and photographer

Particularly noted for his realist depiction of the fisherfolk of Auchmithie and West Haven, Carnoustie, on the east coast of Angus, Scotland. While they are in the tradition of Hill and Adamson's calotypes of Newhaven of the 1840s, (and pay homage to the importance of the French painter Jules Bastien-Lepage 1848–1884), Cox's naturalist approach forgoes sentimentality and the transference of the aesthetics of painting, rather he displays the Scottish characteristic of directness. Cox was contemporary with the emergence of the 19th Century Scottish realist painters, such as The Glasgow Boys (1875–1895), themselves influenced by such stark photographs of the hard life of the working class, particularly the fishing and farming communities. Born Dundee 1849, the eldest of 7 children of George Cox, one of the millionaire Jute barons of Dundee, James Cox took up painting then changed to photography and was active c. 1870s–1880s. Founder member and chair of the Dundee and East Scotland Photographic Association, Cox was particularly interested in process and technique, using albumen, gelatine, carbon and platinum processes, the latter he seems to have preferred. His portraits of fellow artists and his photographs in the current fashion for costume and frivolous fancy dress sit awkwardly with the expressions of poverty and exhaustion of his fisherfolk images. There are four albums in the Scottish National Portrait Gallery's collection dated between 1879–1888.

ALISTAIR CRAWFORD

CRADDOCK AND CO., JAMES
(active 1860s–1890s)

Little is known of the antecedents or background of James Craddock, who maintained a successful and prolific studio in Simla from around 1864–90. He is known to have been one of the photographers involved in recording the durbar held at Ambala in 1869 between the Viceroy Lord Mayo and the Amir of Afghanistan, but is best known for the wide range of topographical and architectural subjects from all over Northern India, produced for the European market. In addition to his photographic studio, Craddock also had business interests in banking, building and printing and appears to have lived in retirement in Simla until at least 1896. His son George Craddock (c. 1859–1934) continued the business, with studios at Simla, Kasauli and Lahore. From about 1890 he appears to have concentrated his activities on Lahore, where he died at the age of 75 and is buried in the Roman Catholic Cathedral.

JOHN FALCONER

CRAVEN, WILLIAM (1809–1866)
English

William Craven 2nd Earl of Craven was born on 18th July 1809 and became the Second Earl of Craven on the death of his father in 1825. He was educated at Eton College and Oxford University and in 1835 married Lady Emily Grimston, the second daughter of the 1st Earl of Verulam. They went on to have a family of nine children.

Craven was a wealthy landowner known to be keen on country pursuits as well as an accomplished craftsman. He took up photography in the early 1850's, making studies on his estate at Ashdown in Berkshire. Ashdown provided Craven with plenty of photographic subject matter and he made many studies on the estate, along with portraits of his young family. He also produced an unique series of high-contrast images of the ornate, geometric parterre that graced the garden of Ashdown House. Craven's photographic output was virtually unknown until a large body of his work came to auction in 2000 and 2001 when his large studies of trees, some in the snow, family portraits, garden views and the impressive "Craven Memorial Album," containing almost 100 images, were seen by historians for the first time. Craven's personal collection included many studies by fellow photographers including Gustave Le Gray, Roger Fenton and Frederick Scott Archer.

Craven used an elegant horse-drawn photographic caravan which, uniquely, served as a portable camera as well as darkroom to prepare his wet-collodion negatives. His photographic activities appear to have been terminated by 1858 due to a stroke and he died in Scarborough, Yorkshire on 25th August 1866.

IAN SUMNER

CRÉMIÈRE, LÉON (1831–1872)

French photographer

Born in 1831, Léon Crémière learned photography as an assistant to the most important photographer of his time, Disdéri. Crémière opened his first studio at 28 rue Laval and 2 rue Frochot in 1861 collaborating with Erwin Hanfstaengl, a German photogapher working in Paris for the aristocracy and people of high society. The same year, he became involved as a member of the Société française de Photographie and was a member until 1864. There he displayed official portraits and also Opéra sets "obtained with electrical light" and animals, "study for rapid photography" (from *Catalogue des exposition organisées par la Société française de Photographie, 1857–1876*, Paris: Jean-Michel Place éditions, 1987).

The publication of the "Album militaire de l'Empereur" in 1961, photographed with Hanfstaengl, portrayed the different military corps, a project from which earned him official acknowledgement and recognition. One year later, he photographied Napoléon III hunting with hounds as well as the imperial farms and became involved with animal photography. His work with animals was exhibited at the Société française de photographie between 1861 and 1865 and the "Exposition canine" of the Tuileries.

As a scientific editor, he released several magazines during the 1860s, specifically "Le Centaure" in 1866 which specialized in sports and "Le Petit Sportsman" in 1868 which focused on hunting. He also contributed to the illustration of works, the most important of which was "La Vénerie française à l'Exposition de 1865." He stopped working at his studio in 1871, and died later probably in 1913.

MARION PERCEVAL

CRIME, FORENSIC, AND POLICE PHOTOGRAPHY

Photographers and criminals exploited the photograph for illegal activities well before public authorities incorporated the photograph successfully into criminal investigations and legal proceedings in the last two decades of the 19th century. By the late 1840s, for example, there was an established international market for pornographic daguerreotypes violating obscenity laws in most countries. Similarly, as paper-based photography improved in the 1850s, there was an increase in currency counterfeiting by photographic means, though the lack of colour and loss of surface details precluded any widespread activity.

Forensic photography—primarily to identify suspects and convicts, but also to survey crime scenes and document clues—did not come into systematic use until the 1880s, despite numerous isolated efforts dating back to mid-century. The relatively slow appropriation of photography for criminalistic and forensic ends, despite photography's rampant popularity and rapid growth in other sectors of society, can be attributed to at least two important factors. The first was the practical difficulty of establishing systemic and standardized photographic methods across jurisdictions given the significant costs and complicated processes that the medium entailed before the availability of factory-prepared photographic plates. The second was a prevailing uncertainty concerning the legitimacy of the photograph as a convincing legal document bearing reliable scientific content. As Western legal tradition was primarily text-based, the new visual language of photography entailed a fundamental shift in the approach to the image as evidence, requiring subsequent changes in jurisprudence, before the photograph would circulate freely within police departments and courtrooms.

As early as 1844, inventor William Henry Fox Talbot suggested that photographs could be used to catalog valuable objects and recuperate stolen property. "If the mute testimony of the picture were to be produced against [the suspect] in court—it would certainly be evidence of a novel kind," he wrote in *The Pencil of Nature.* In a more far-fetched application, scientific and popular journals throughout the second half of the 19th century recounted experiments photographing the retinae of murder victims in the hope of obtaining an afterimage of the culprit.

Despite these examples, however, the principal forensic use of photography in the 19th century was in documenting and tracking suspects. The mid-century fascination with physiognomy and phrenology, both of which entailed the study of facial features and other physical attributes as indicators of an individual's moral character, fuelled an interest in photographing the "criminal type" as a scientific, rather than sociological, subject. To this end, in 1846 Marmaduke Sampson's *The Rationale of Crime and its Appropriate Treatment* included an appendix of engraved portraits of New York state prisoners, made from daguerreotypes by Matthew Brady.

By the 1850s, police and prison officials in communities in the United States and Europe began photographing prisoners for "rogues' galleries" to track repeat

offenders. The practice was highly localized, thereby limiting the usefulness of the photograph as a regular investigative tool or legal document. Often made by professional portrait galleries, the arbitrary approach to these photographs diminished their scientific value, and those made as daguerreotypes or ambrotypes had an additional physical fragility and uniqueness that prevented widespread circulation.

Photography's role in two high-profile investigations of the 1860s and 1870s helped establish its place as a practical tool in police work. The first was the hunt for suspects in the aftermath of U.S. president Abraham Lincoln's assassination in 1865. Government-issued wanted posters included albumen carte-de-visite format photographs of the principal suspects, while the Secret Service called upon Alexander Gardner to photograph the crime scene, the convicted conspirators and their subsequent execution. The other instance was the round-up of suspected insurgents after the fall of the Paris Commune in 1871, when government officials relied on photographs of Commune crowds as evidence linking individuals to the events. Officials compiled albums of suspected Communards and hired photographer Eugene Appert to photograph suspects as they were apprehended.

In 1870 the British government required all prisoners to be photographed, with additional prints sent to Scotland Yard for a national archive, but after the Commune, Paris became the leader in forensic photography for much of the rest of the century. Its Prefecture of Police established a photographic service in 1874 and criminal identification photography came into regular use. Two competing methods for documenting criminals arose in Europe at this time, one devised in England by the statistician Francis Galton, the other developed in France by Alphonse Bertillon, a physical anthropologist. Galton's system was meant to be a preventive measure, furthering the argument of the biological causes of crime by producing photographic composites of known criminals to aid authorities in building criminal stereotypes. Italian psychiatrist Cesare Lombroso applied Galton's method to his own research in eugenics, and used photographic composites in *Criminal Man* (1876) to argue the genetic inferiority of criminals.

Conversely, Bertillon's system—first suggested by Ernest Lacan in 1854—sought to solve specific crimes rather than the roots of criminality. It involved documenting suspects by coupling standardized full-face and profile bust photographs (eventually called a "mug shot") with a set of precise anthropometric measurements. Appointed Chief of Judicial Identity in 1879, Bertillon created a huge photographic and statistical archive for the Paris police, and by 1893 he claimed that it had helped identify over 4,500 recidivists. Bertillon also compiled tables of sectional photographs of facial features to aid police in piecing together a suspect's appearance from witness testimony. His methods, known as "bertillonage," quickly spread as far as Russia and the U.S., aided by his numerous books on the subject.

Despite occasional examples reaching as far back as the 1860s, crime scene photography only became standard practice in the closing years of the 19th century, as police departments hired staff photographers and the invention of flash photography made on-the-spot field work practical. Metric photography became fundamental to such activities, employing wide-angle lenses and large plates to capture fine details while photographing at precise angles (often directly overhead) with measuring scales that permitted accurate computation of distances. Similarly, stereometric photography documented individual articles of evidence with carefully measured front and side views. In these fields as well, Bertillon took the lead, promoting them through displays at the 1889 Universal Exposition in Paris and the 1893 World Columbian Exposition in Chicago. By the early 20th century, such photography would commonly appear as evidence in courthouses around the world.

STEPHEN MONTEIRO

See Also: Pornography; Daguerreotypes; Talbot, William Henry Fox; Brady, Matthew; Galton, Sir Francis; Bertillon, Alphonse; and Lacan, Ernest.

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CRITICISM

Most photography criticism in the nineteenth century attempted to identify photography's applications and areas of expertise; a smaller group of texts also included de-

scription and critique of individual photographs. There was much of both kinds of writing in the 1850s and '60s, when the medium was growing into its technical and commercial potential. After that, photography criticism appeared intermittently (and on the model of painting criticism), as a necessary feature of art photography movements. Those movements and their twentieth-century equivalents singled out certain early practitioners as exemplary forebears; but nineteenth-century photographers and photographs received unprecedented critical attention in the last quarter of the twentieth century, when debates about the nature and quality of early photography sprung from two intertwined developments: the maturity of photographic theory, and the medium's new presence in the art market.

Early criticism was centered around photographic societies and the exhibition venues they created. The greatest number of texts are French, reflecting the role Paris played as the first modern art capital, with a developing market for painting *avant-gardes* and much attention to the industry of art reproductions. Some of the best French criticism has to do with photography's relation to Realism and Naturalism, or with the medium's role vis à vis traditional printmaking media. Francis Wey's writing is the chief example, and also the earliest. In the course of 1851 Wey wrote twenty-three articles for *La Lumière*. His attention to the medium subsequently subsided, but Wey is the only figure in the nineteenth century who engaged in programmatic photography criticism: he attempted to identify photography's relationship to other mediums, and some of its particular qualities. Wey's writing affected the thinking of other writers for *La Lumière*, who often engaged in remarkable descriptions of individual photographs, making that journal the best source for early photo criticism. Henri de Lacretelle praised Gustave Le Gray's Mission Héliographique photographs of the cloisters at Moissac and Saint Trophime in these terms: "The arabesque unfurls, the trefoil cuts a relief, the ogive arch lets the daylight pass, the glass draws its legend with perfect transparency. M. Le Gray has a palette in photography: he varies his tints to infinity, clarity cannot go further. The page itself seems of stone or marble." Charles Gaudin, reviewing one of Ernest Lacan's photographic soirées, had this to say about Charles Marville's photograph *L'Ecole des beaux-arts sous la neige*:

> A thick layer of snow covers the ground, the statues of the facade, and the architectural fragments that adorn this courtyard. The effect of the snow is admirably rendered; but what is most striking is the effect of the perspective. The planes fade and withdraw in a vaporous atmosphere, and the background details draw themselves with charming delicacy. I wish I could better describe this remarkably beautiful work; it is one of the most surprising results that has yet been obtained.

Both descriptions are of architectural views, a subject singled out by Wey and agreed upon almost universally as apt to photography.

Wey's conviction that photography was also the best medium for artist's studies, especially those of landscape motifs with light and weather effects, found an echo in the writing of Sir William Newton, a British miniaturist and amateur photographer. In 1853 Newton delivered a paper to the newly formed Photographic Society, upon the topic of photography's relation to the arts. He suggested that when artists were making photographic studies for use in the studio, they should throw camera subjects a bit out of focus, to better record effects of light and atmosphere. Lady Elizabeth Eastlake concurred with Newton's observations, finding the accumulation of contrasting details in most photographs the quality that removed them from visual "truth." Eastlake praised the calotypes of David Octavius Hill and Robert Adamson for their Rembrandtesque chiaroscuro. However, for Eastlake, photography's value lay less in its relation to art than its ubiquitous social presence, and its ability to render present absent loved ones. She wrote about portraits of children: "the very shoes of the one, the inseparable toy of the other—are given with a strength of identity which art does not even seek." Eastlake's few observations about the intimate relationship possible between viewer and photograph resonate with pictures by her contemporaries Julia Margaret Cameron and Clementina, Lady Hawarden. The same critical predilection is widely elaborated in later photography and criticism, notably the writing of Roland Barthes (q.v.).

Many early critics delighted in photographs' masses of details, precisely for the surplus of information they brought. This is clear in reviews of another subject understood to be suited to the new medium, travel views, especially when they were produced as stereographs. The most interesting American voice from this period, Oliver Wendell Holmes, Sr., popularized photography in three essays for *The Atlantic Monthly*, between 1859 and 1863. His chief object was the stereoscope, but he informed his readers about the technical production of various kinds of photograph, and their possible applications, from criminal profiling to the stereographic exploration of great cathedrals. This is not criticism *per se*, but Holmes' passion for the medium makes him one of its best writers:

> "A painter shows us masses; the stereoscopic figure spares us nothing—all must be there, every stick, straw, scratch, as faithfully as the dome of St. Peter's, or the summit of Mont Blanc, or the ever-moving stillness of Niagra...Theoretically, a perfect photograph is absolutely inexhaustible."

Holmes marveled at the profound disruption photographs caused in the experience of the world. He

declared "Form is henceforth divorced from matter," and imagined great libraries of stereographs as future storehouses of knowledge.

Holmes embraced photography's technical potential, and, implicitly, its industrial possibilities. Other writers (all photographers) began to assert the medium's status as art. Paradoxically, this involved emphasis on the manual making of the photograph, and its uniqueness, in order to demonstrate the presence of the artist's imaginative intellect in the work. Henry Peach Robinson, inspired by the work of Oscar Gustav Rejlander, began making composite photographs in 1857, with a view to producing finished *tableaux* on a par with academic painting. Robinson wrote copiously on photography; his 1869 book *Pictorial Effect in Photography* is his definitive treatise. It is modeled on the *Discourses* of Sir Joshua Reynolds: Robinson largely co-opted Reynolds' precepts for painters, arguing that the "immutable laws" of art apply as well to photography as any other medium. He thus concentrated more on the compositional probity and completeness of a finished work than on the particularities of photography, although his chapter devoted to combination printing is a vivid blend of technical instruction and aesthetic opinion.

Robinson's book was translated into German and French, and survived for several editions. It satisfied a void in photographic literature: most art critics who mentioned photography did so dismissively, and their comments were generally aimed at painters and printmakers. Charles Baudelaire's famous tirade about the medium in his 1859 *Salon* is more substantive than most references to photography, as he proclaimed photography the antithesis of art *and* catalogued the good purposes he could find for the medium, but the passage was nonetheless written as a prod to painters. Similarly, Phillipe Burty's numerous references to photography were typically foils for his enthusiastic support of etching and engraving, especially during the etching revival of the 1860s, which arose in a distinctly anti-photography climate among painters and reproductive printmakers.

Baudelaire certainly had Robinson and Rejlander in mind when he mockingly wrote about the authors of photographic *tableaux* "committing a double sacrilege, and insulting, at one and the same time, the divine art of painting and the sublime art of the actor." But Robinson's staunchest critic was Peter Henry Emerson, his follower in the paired fields of pictorial photography and photo criticism. Emerson's brief advocacy of art photography stemmed from his preference for naturalistic art; Robinson's academic compositions and evenly sharp focus were anathema to him. In his book *Naturalistic Photography* (1889), Emerson based his arguments on modern optics: he contended that photography was the best medium to approximate actual visual experience, through its control over focus and tonal range. Differential focus, and even blurry photographs, were promoted as means to photographic art.

By 1891 Emerson retracted his claims about art photography, but his and Robinson's writings had contributed much to the Pictorialism movement. Art photography clubs sprang up in many cities and towns of the industrial world in the last decades of the nineteenth century. Groups communicated with each other through journals, and photographers met at regional and international exhibitions. Alfred Stieglitz won a medal—awarded by Emerson—at one such meeting, sponsored by the *British Amateur Photographic Society* in 1887. Stieglitz recognized that art photography's legitimacy would be attained as much through the paraphernalia of art movements—journals, exhibitions, criticism—as through photographs. Exhibition reviews became a staple of the movement, and Pictorialists sought artistic forebears from early photography. Three "old masters" emerged: Julia Margaret Cameron, David Octavius Hill, and Nadar. The critical fortunes of these three had to do with personal connections—Cameron and Nadar each had sons who were active photographers who promoted their parents' work (Nadar himself lived until 1910). Hill and Adamson calotypes (Adamson was forgotten at this time) were collected and disseminated by the Scots photographer James Craig Annan. The early work was praised for the primacy given to artistic effect: Annan wrote about the chiaroscuro in Hill's calotypes. Cameron was praised in *Camera Work* for "[realizing] what few could then appreciate, the difficulty of dealing with the critically sharp definition of the portrait lens."

Modern enthusiasm for nineteenth-century photography arose in several circles in the 1920s and '30s. Nadar, Cameron, and Hill remained the most widely-known figures from the past. The Surrealists went beyond them, and embraced virtually all forms of nineteenth-century photography, as touchstones to Surrealist sensibility. Pierre Mac Orlan wrote:

> Phonograph, photograph, all the graphs, after being thrown far from delicate, sensitive existences, are reinstated in the lives of those who marvel at seeing and hearing. They take a unique revenge in restoring to the things whose limits they mechanically reproduce the presence of that universal mystery of which everything possesses a part that confers on it both its personality and its interest in the world.

Man Ray discovered the photographs of his neighbor Eugène Atget (who came to be seen by all of his admirers as a holdover from the previous century), and published the most enigmatic of them—window reflections, crowds gazing at nothing in view—in *La Révolution Surréaliste*. Man Ray's studio assistant, Berenice Abbott, took Atget's work to the United States, and his reputation on a different trajectory. She promoted Atget as the great

"straight" photographer, free from the arty pretense of Pictorialism and its Stieglitzian afterlife. Abbott and Walker Evans both wrote short, influential articles which celebrated Atget's photographs. Abbott also mentioned the work of Mathew Brady, Timothy O'Sullivan, William Henry Jackson, and the U.S. Geological Surveys, as the epitome of clean, great photography.

Other *avant-garde* photography movements were not so preoccupied with nineteenth-century precursors. However, in Europe in the 1930s, several writers began to view photography as the most important visual medium of the era, and they sought ways to incorporate it into the history of art. Heinrich Schwarz and Walter Benjamin both turned to the model of Alois Riegl and the Vienna School of art history. Riegl had insisted on the importance of minor arts in any historical period: devotion to a given material or process must be studied seriously. Schwarz undertook a study of David Octavius Hill (1931), and argued that the photographer's use of the calotype process was the perfect expression of the bourgeois society of 1840s Edinburgh. Benjamin, whose 1931 essay "A Short History of Photography" is partly a review of Schwarz's book, took up the argument, and extended it to suggest that the wide photographic experimentation of the 1930s made photography yet again central to the culture. In his 1936 essay "The Work of Art in the Age of Mechanical Reproduction," Benjamin went further, and stated that the nineteenth-century debates over photography as art missed the point: "The primary question—whether the very invention of photography had not changed the entire nature of art—was not raised." Benjamin's point was that the conditions of photography swept away old notions of self-expression, genius, and craft, by which art had hitherto been defined. His model was Atget, who had systematically catalogued Paris without any evident interest in arguments about art or photography.

From the 1930s, historical and aesthetic interest in early photography grew. Many artists and critics took the medium seriously—whether as mode of expression or simply as the ubiquitous visual stuff of the age. A broad range of writers paid attention; by the 1970s there was a body of photographic theory to draw from, the history of the medium was better understood, and there was active interest in collecting work from all periods. The rise in values for vintage prints in the 1970s led to a hunt for old material: museums and libraries transferred whole bodies of work from archives and library shelves to exhibition spaces and art storage. The Museum of Modern Art acquired Berenice Abbott's vast holdings of Atget material in 1969, and between 1981 and 1985 celebrated him as a master of modern art, with major exhibitions and a four-volume publication. Other early practitioners, such as Gustave Le Gray and Henri Le Secq, also received monographic attention.

A divide in the critical community arose around these exhibitions: one group of curators and historians celebrated the over-due recognition of photography by the artworld establishment (Eugenia Parry Janis, John Szarkowski), while others loudly demanded at what cost to the understanding of nineteenth-century photography these objects were being fed into the system of gallery/museum/auction-house, as yet more examples of great modern art (Rosalind Krauss, Christopher Phillips, Allan Sekula, Abigail Solomon-Godeau). The latter writers invoked Benjamin, and they also turned to Roland Barthes, whose 1980 book *Camera Lucida* took up Benjamin's observations about photography's resistance to authorial intent. Barthes insisted on photographs' absolute, structural difference from all other kinds of visual image: the photograph always "carries" its referent with it, and the viewer's relationship to the referent can be intensely personal. Barthes included nineteenth-century images because they exacerbate one condition of all photographs: the presentation of a past moment in time, Barthes' "that-has-been." For Barthes, as for Benjamin, photography is more powerful than art.

These critical debates continue. Szarkowski has elaborated a lucid formal critique of the art of photography in many books. For him, the medium was "born whole": great photographs are generated when photographers learn their craft, and look at other photographs. No other training is necessary—any vernacular image might be a successful picture. Diverse authors have written against this position, insisting on the social role played by photographs, and writing material histories of nineteenth-century photography. Others have insisted upon the medium's persistent difference from all comparable categories of picture, and the consequent changes photography caused in modern experience.

PETER BARBERIE

See Also: *La Lumière*; Mission Héliographique; and Photographic Exchange Club and Photographic Society Club, London.

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CROMBIE, JOHN NICHOLS (1827–1878)

Scottish photographer

John Nichols Crombie (1827–1878) was a Scot who came to New Zealand from the gold-fields of Victoria, Australia, where he¹d worked for a time with the American firm of Meade Bros. During his initial stay in Auckland (1854 to 1856) he claimed he¹d made over a thousand portraits, with a further 450 in Nelson and the Southern Provinces. After this tour he traveled back to Australia where he acquired the skills of an ambrotype artist and collodion photographer. One of Crombie¹s endearing qualities was his constant ability to gain the attention in the newspapers with reports of his photographic activities. This echoed his rise to fame and fortune. With the money he made from photography, he invested wisely in property and gold mining shares. On September 4th, 1862 he returned to Scotland where he gave a talk to the Glasgow Photographic Association at the commencement of their 1862–1863 season. A report of this was published in the British Journal of Photography in 1863. It is one of the first reports of its kind which identifies some of the problems encountered by those who went to New Zealand with a camera. Crombie returned to New Zealand and expanded his business interests. When he and his wife finally departed for good in 1872, they entertained their friends on a grand scale by giving a ball. He died in Melbourne.

WILLIAM MAIN

CROOKES, SIR WILLIAM (1832–1919)

English scientist, photographer, and editor

Crookes was born in London in 1832 as the eldest of sixteen children of a tailor. As the son of a man of comparatively modest means, Crookes received irregular schooling until studying chemistry at the Royal College of Chemistry from 1848 until 1854. Displaying an early interest in photography, Crookes used it as a research tool. In 1852, he tried to photograph the colored rings shown by certain crystals between tourmaline plates in polarized light. He obtained the photographs by using either calcspar or nitro, but also traced certain abnormal figures due to rays beyond the visible spectrum that had never been seen by the naked eye. Crookes joined with another chemist, John Spiller in May 1854 in penning an article for the *Philosophical Magazine* that discussed the use of glycerin as a means of prolonging the moist and sensitive state of collodion film.

A physical chemist, Crookes suffered from taking a nontraditional route to the profession as most top scientists came from universities. Lacking superior qualifications, he scrambled to make a living. In May 1854, he was appointed superintendent of the meteorological department of the Radcliffe Observatory at Oxford. The position proved to be a short one, lasting only one year but Crookes again applied photography to his work. He made meteorological records at the observatory using the wax-paper process. In 1856 he took some photographs through a telescope of the moon that were one and one-fourth in diameter. His moon photographs were exhibited at the Crystal Palace. The photographs included great detail and Crookes obtained a grant from the Royal Society to enlarge them by twenty diameters, a scale that could not have been achieved if he had employed the gelatin process rather than the wax-paper one. He received an additional grant from the British government to defray the cost of experiments for finding a portable means of illuminating objects in dark places sufficiently to enable them to be photographed. In 1857, he produced a 60-page *Handbook to the Waxed-Paper Process in Photography*.

In 1856, Crookes moved to London, where he set up an analytical laboratory in his home and began to edit a number of scientific journals, including *Chemical News*. A patient and careful man who quickly earned renown for experimental ability, Crookes aimed to prove that pure scientific research could lead to financial rewards. Among his achievements are the Crookes Tube, a predecessor of the cathode-ray tube used in television sets; the spinthariscope, which registers radioactive decay as flashes on a phosphor screen; and the radiometer, which shows radiant energy.

In his London home, Crookes devoted his energies to the development of photography and edited the Liverpool Photographic Journal from November 1856 until March 1857. In March 1857 he also began to edit the Journal of the London Photographic Society and served as that organization's secretary. In 1857, after reading a paper entitled "The Albumen Process on Collodion,"

Crookes proposed to resolve one of the main problems with glass negatives. Glass easily picked up impurities and photographers found it difficult to produce clean negatives. Crookes advised coating glass with collodion then using it as a basis for the albumen process, which was already common knowledge. To aid photographers, he invented a box of tinplate that light could not enter and a bottle for pouring albumen free from froth. In 1858 he made a two-year commitment to supply articles on photography to the *Photographic News.* Crookes cemented his reputation as one of the leading scientists of his day by discovering a new metallic element, thallium, by means of spectrum analysis in 1861.

By the 1870s, Crookes' interests changed and he began to speculate about theoretical scientific matters, including spiritualism. Crookes' beloved younger brother Philip had died in 1867 and the scientist hoped that spiritualism could provide a reunion. Although warned of the risk of ridicule, Crookes announced his intent to investigate mediums. In the nineteenth century, mediums commonly communicated with the dead by entering a trance while alone in a room. The manifestation, which many observers noted looked exactly like the medium, would then mingle with guests as the medium purportedly remained behind in the other room with her face hidden under a blanket. Although he conducted inquiries about other spiritualists, Crookes achieved lasting fame for his photographs of Florence Cook, who summoned the manifestation "Katie King." To determine if the medium and the materialization were indeed two separate beings, Crookes proposed a series of séances to be held in his home. Convinced of the existence of genuine mediums, Crookes ruled out trickery as a possible explanation for the manifestations. He planned to obtain photographs of the two women. He took 44 photographs of King using five cameras from December 1873 to May 1874. Midway through the experiment, on 30 March 1874, he announced that he had obtained proof of Cook's innocence and of the actuality, paranormal nature, and separate existence of King. The results of Crookes' experiments were published in W. H. Harrison's paper *The Spiritualist* in the form of a series of letters that were afterward republished as part of the book *Researches in the Phenomena*. Nearly all of the photographs and negatives were later destroyed but one of published pictures depicts Crookes arm-in-arm with King. Only one photo depicted both the materialization and the medium, but unfortunately King sits in front of Cook thereby concealing her head. No photograph shows the faces of both women. Few scientists accepted Crookes' proof, but the certification of a noted man of science significantly bolstered Cook's fame and financial situation as well as aiding the cause of spiritualism. Charged with unscientific practice, Crookes seriously damaged his professional reputation and gave rise to speculation that he was protecting the medium because of romantic involvement with her. He dropped his spiritualist investigations in 1875 though his interest remained strong. Crookes belonged to the Society for Psychical Research from its 1883 founding and served as its president from 1896 to 1899. In later years, he served as president of the Royal Society (1913–1915) having been made a fellow of it in 1863. Knighted in 1897, he remained active until his 1919 death.

CARYN E. NEUMANN

Biography

Sir William Crookes was born at 143, Regent Street, London, England on 17 June 1832 to Joseph Crookes, a prosperous tailor, and his first wife, Mary Scott. Demonstrating an interest in photography while studying chemistry at the Royal College of Chemistry (1848–1854), Crookes and John Spiller co-wrote an article on the collodion process for the May 1854 *Philosophical Magazine.* In 1857, he produced a 60-page *Handbook to the Waxed-Paper Process in Photography*. He edited the *Liverpool Photographic Journal* (1856–1857) and served as the secretary of the London Photographic Society and the editor of the fourth volume of its *Journal* (1857–1858). While stressing photography as a means of livelihood, Crookes expanded his knowledge with the aim of qualifying as a consulting chemist. He studied a wide range of subjects and conducted experiments on a number of subjects. He also found time to marry Ellen Humphrey of Darlington on 10 April 1856 and the couple eventually produced ten children. On vacating the editorial chair of the Photographic Society's *Journal,* Crookes agreed to publish his photographic articles only in the *Photographic News* until 1860. In 1859, Crookes brought out a new chemical weekly, *Chemical News,* using it to make him one of the most important people in the English chemical world. Fascinated by spiritualism, Crookes published four articles on the subject. The first of these, "Spiritualism Viewed by the Light of Modern Science" appeared in July 1870 in the *Quarterly Journal of Science.* "Experimental Investigation of a New Force" appeared in the same journal in July 1871 and was reprinted in the *Chemical News*. "Some Further Experiments on Psychic Force" (October 1871) with a summary of Crookes' spiritual investigations printed in the January 1874 *Quarterly Journal of Science. Researches in the Phenomena of Spiritualism* summarized Crookes' experiments with mediums. An exceptionally prolific writer, Crookes' more notable later works include *Select Methods in Chemical Analysis* (1871), which gave information on the methods of isolating rare elements, and a paper read before the Royal Society on 11 December 1874 "Attraction and Repulsion Resulting from Radiation" which introduced Crookes' new inven-

tion, the radiometer. He received a number of honorary university degrees and distinctions in recognition of his outstanding scientific work, including a knighthood in 1897 and the Order of Merit in 1910. Widowed in 1916, Crookes died on 4 April 1919 at the age of 87 in Kensington Park Gardens.

See Also: Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); *Photographic News (1858–1908)*; and Spirit, Ghost, and Psychic Photography.

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CROS, CHARLES EMILE HORTENSIUS (1842–1888)

French physician and poet

Cros, a poet, was born in 1842. In photography, he is known for his early three-color photographic experiments. Cros had, like Ducos du Hauron, been working on a subtractive method to obtain full color prints. Cros did not have a studio of his own, instead he performed his photographic experiments in his friend's, Herzogs von Chaulness, photographic studio.

Cros made photographs through red, green and blue filters, which were converted to positives. However, rather than converting them into transparencies for projection he dyed each positive with the complementary color of its original filter. Precisely overlapped on white paper, the three sheets fused into a full color image of the original. Unfortunately, the color sensitivity of b/w negative emulsions at this time was rather poor. The film was mainly sensitive to blue and some parts of the green spectrum. There was virtually no red sensitivity at all. Therefore Cros' color prints were less than perfect. In a letter, sent to the Academy of Sciences in Paris, Cros described his color photography experiments. The letter was deposit on December 2, 1867 not to be opened until 1876.

Only two days after Ducos du Hauron was granted a patent on the same technique, Cros published the correct principle of the subtractive color method in *Les Mondes*, February 25, 1869.

Cros described a photochromoscope and how to set up the components within the camera to make three-color separated negatives. Later, on May 7, 1869, did Cros present his technique at the Société française de photographie. On the same day had Alphonse Davanne, the vice-president of the society read a report about Ducos du Hauron's similar work.

On 23 December 1878 a seminar by Cros was presented at the Academy of Sciences in Paris in which he described a photochromoscope which he referred to as a *Chromometre*.

Cros invented the *hydrotype* process in 1881, which is a reversed collotype process. It can be used in color printing. A gelatin image is made to absorb dyes in proportion to the action of light so that, when a paper is brought in contact with the stained plate, a color image can be transferred from the dye. The color image recorded in a camera is received on a chromo-sensitive surface composed of red, yellow and blue superimposed or juxtaposed, the color-sensitive material being so selected that each pigment is destroyed by light of complimentary color. Thus, the orange rays destroy the blue pigment, the green rays destroy the red pigment, and the violet rays destroy the yellow pigment. The glass plates were made by having collodion colored red by cartharnine, then gelatin colored blue by phyllocyanide, and finally collodion made yellow by curcuma.

Hans I. Bjelkhagen

Biography

Charles Emile Hortensius Cros was born on October 1, 1842, in Fabrezan, France (Department of Aude) After his baccalaureate in 1859 Cros started to study medicine which he never completed. Instead, he started to live a bohemian life, meeting with artist and writing poems.

Cros has published many poems, e.g., *Le coffret de santal*, for which he was awarded the Juglar Prize.

On December 2, 1867, Cros was granted a patent on his three-color helichromy method.

His book *Solution générale du problème de la Photographie des couleurs* was published in 1869. In April 1877 Cros described a device to record and replay acoustic waves. Instead of storing the sound on cylinders as was chosen by Edison, Cros suggested the used of a disc instead.

Cros married Mary Hjardemal in 1878 and they had two sons, Guy-Charles (1879–1956) and René (1880–1898). Cros died on August 9, 1888, in Paris.

See Also: Ducos du Hauron, André Louis; and Davanne, Louis-Alphonse.

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CRUCES, ANTIOCO AND LUIS CAMPA (active 1862–1877)

Antioco Cruces and Luis G. Campa are credited with fomenting the carte de visite craze in Mexico City between 1862 and 1877. They both attended the Academy of San Carlos, a prestigious art school in Mexico City and may have received some professional support from photographer José Maria de la Torre who worked with them between 1863 and 1866, but like many photographers of the time period, they were self-taught. Their studio, Fotografia Artistica, located near the Cathedral, was considered one of the most important in a city where keen competition existed in the photography business.

In 1876 their work on "Mexican Popular types" ("tipos") received a bronze medal at the Philadelphia International Exhibition. The following year Campa, an engraver, who had been teaching at the Academy of San Carlos, left the partnership to teach full-time. Cruces continued alone for several decades and became known as the "dean of photographers" of Mexico City. Toward the end of his career, Cruces served as the official photographer for the Mexico City jail and later for the War Ministry.

The Cruces and Campa images depict the personages of Maximilian's short-lived Mexican empire; notables of Mexican society and those who could afford the studio's prices; as well as the popular ethnographic "occupationals" and "tipos." They also produced a number of stereoviews and "illuminated enlargements" (hand colored prints). Collections of their work are preserved at the Museo de Fotografía in Mexico City and at Tulane University in New Orleans.

Yolanda Retter Vargas

CRUICKSHANK, JOHN W. (1852–1918)

Scottish survey photographer

Born Aberdeen, of the famous Scottish Quaker family of world-famous shorthorn cattle breeders, John Cruickshank was sent at the age of 10 to Ackworth, Pontefract, and Kendal Quaker Schools, and after training as an engineer in Leeds, he returned to Scotland on the death of his father in order to help his uncle Amos Cruickshank (1808–1895) of Sittyton run his herd. His business interests become extensive, including banking, jute, and meal mills. In 1892, aged 50, he retired from business and moved to a specially built Art & Crafts mansion Coombe Head, Haslemere, Surrey. Ill health then determined a permanent move to Florence in 1912 where he and his wife, Alice Mary Henderson (1861–1920), also established a Quaker Meeting. Along with his wife, he wrote several guide books in the Grant Allen series, including *Umbrian Towns* (1901) and *The Small Tuscan Towns* (1912), illustrated with his direct and elegant photographs. Deeply religious and scholarly, Cruickshank was a lover of mediaeval manuscripts and Romanesque, Lombard and Gothic church architecture and sculpture, especially its symbolism. He made extensive and exceptional photographic surveys throughout Europe, in particular, Tuscany and Umbria. His photography has affinities with Frederick Evans (1853–1943). A collection of over 1,500 negatives is held at the Conway Library, Courtauld Institute, London, and over 3000 prints, using platinum and various rich sepia papers, together with 500 negatives and his library, are at the British School at Rome.

Alistair Crawford

CUBA

In March of 1839, a Havana newspaper reprinted an article on J. M. Daguerre's new "method of fixing images." A year later, Pedro Tellez de Girón took the first known daguerreotype on Cuban soil, an image of part of the Plaza de Armas in Havana. In early 1841, North American, George Halsey announced that he was ready to photograph people using a new admirable and "amazing invention." He stayed until June, after which his studio was acquired by one R. W. Hoit. In the same year, the Italian Antonio Rezzonico, newly arrived from New York, opened his studio and offered to produce not only studio portraits but also city and rural views. Two illustrations derived from daguerreotypes taken with his equipment, were published in the book *Picturesque Island of Cuba* (1841). Several years later, Cuban-born Esteban Arteaga returned from Paris and announced his ability to produce daguerreotypes "with color."

North Americans Charles and Jacob Ward arrived in Chile in 1848 after working as photographers also in Perú and Bolivia. They offered to photograph "squirming" children as well as individuals and groups in home settings. Hungarian Pal Rosti, arrived in 1857 and for three months recorded city views, coffee plantations and ethnographic subjects. By that time, Cuban-born Francisco Serrano and Esteban Mestre were producing ambrotypes and paper prints. Charles DeForest Fred-

ricks, owner of successful studios in New York and Paris, opened another in Havana in 1857.

In Cuba, Fredricks worked with several partners including George Penabert, Augusto Daries and Samuel Cohner. Fredricks had traveled and photographed widely in South America, and was known for his cartes de visite and his outdoor views. His images of modern buildings and public works were meant to reflect national progress and achievement. It was a method of dispelling negative stereotypes and encouraging foreign investment in Latin America. In the 1850s, increasing interest in travel created a market for the new stereoview format. New York photography publisher E. Anthony sent George Barnard to Cuba where he recorded numerous images of people and places. These later appeared in Anthony's stereoviews without photographer attribution.

As in other countries, the business of photography attracted an increasing number of practitioners. The *Havana Annual* of 1859 listed seventeen daguerreotypists including two women, Encarnación Irastegui and Francisca Madero. The 1860 *Havana Directory* included photographers L. Cabrera, Juan B. Fernández & Co., O.B. Loomis, as well as the studios of José Cotera and Carlos Serpa and a photographic museum managed by José López Molina. By 1884, twenty-seven photographers were listed in a directory of the island.

Growing interest in photography among Cubans led to the formation of associations, as well as to exhibitions and publications. One photograph made by Cohner shows the photographer Fredricks at a gathering of the Cuban Photographic Society c.1860. The first exhibition of Cuban photography was held in 1868 and in 1882 Domingo Figarola published *The Photographic Bulletin*, the first Cuban photography journal. The following year, The Association of Amateur Photographers was formed in Havana.

A second generation of Cuban photographers included Esteban Mestre's son Narciso, whose studio was prominent in Havana in the 1870s. Father and son left an important record of Cuban architecture and city views. In the provinces, Bavastro and Agüero photographed parts of Santiago in eastern Cuba; and Jacinto Cotera in the 1870s, and Salay y Roig toward the end of the century, were among those who had studios in Cienfuegos.

Between 1868 and 1898, Cubans fought to achieve independence from Spain. The main conflicts are remembered as the War of '68 and the War of '95. The first was recorded by numerous foreign and Cuban photographers including the firms of Fredricks y Daries; and individual photographers Elias Ibañez, Andres Oca, Leopoldo Varela y Suárez, José Robles and Esteban and Narciso Mestre. The war of 1895–1898 was documented by photographers such as José Gómez de la Carrera, Gegorio Casañas, Ramón Carreras, Luis López, and the firm of Otero y Colominas.

During the Cuban-Spanish War, publishers of stereoscopic views used that medium to both inform and propagandize to audiences eager for vivid images of events in Cuba and other Spanish territories involved in the conflict. Historian Sarmiento Ramírez notes that while many of the photographs from the '95 War were posed, they do provide valuable documentary evidence regarding the quotidian life of both warring sides as well as a record of people, places and events related to the conflict. In 1898, after the ship *Maine* was blown up by persons unknown, the United States entered the conflict. Spain surrendered to the U.S. in 1899 and the latter officially governed Cuba between 1899 and 1902. According to researcher James Swick, during that time U.S. stereoview publishers used the medium to "reinforce both the image of a 'benevolent' empire and the racial stereotypes that provided much of its ideological justification."

During the War of '95, cameras served a new purpose, recording not only battles, but also human rights abuses. When the Spanish general Valeriano Weyler placed Cuban families in "reconcentration" camps, the new Kodak cameras were smuggled in and used to make a dramatic record of dismal camp conditions and the inhumane treatment of the incarcerated. Both photoeditor Ramiro Fernández and curator Gary Libby, have noted that those images laid a cornerstone for photojournalism in Cuba. The images also contributed to the wide use of photography as a propaganda tool later in the twentieth century.

According to Rufino del Valle Valdés, president of the Fondo Cubano de la Imagen Fotográfica, the history of early Cuban photography is under-researched. In addition, United States foreign policy prevents what does exist from being widely distributed in the United States and economic conditions limit what can be published in Cuba. Cuban-born Ramiro Fernández, now living in New York, owns a significant collection of Cuban photographs from the daguerreotype era onward. His collection of photographs from 1860–1920, was exhibited at the Museum of Arts and Sciences in Daytona Beach, Florida in 1988. The catalogue of the exhibition includes a useful chronology of the history of photography in Cuba.

YOLANDA RETTER
WITH CONTRIBUTIONS FROM RAMIRO FERNÁNDEZ

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CUCCIONI, TOMMASO (1790–1864)

Italian, photographer, printmaker, publisher

Prior to taking up photography in the early 1850s, Tommaso Cuccioni trained as an artist engraver, working first with the government engraving office (1830–35) and then operating his own business engraving and selling *vedute* from his shop in central Rome. He began photographing the subjects of his engravings—views of Roman antiquities such as The Temple of Vesta, The Baths of Caraclla, The Column of Trajan, views of the forum, and the banks of the Tiber—which he offered for sale alongside traditional engraved views. The large format of his photographic prints established an equivalence with engraved views by approximating the dimensions of the engravings, a strategy employed by another Roman photographer, Robert MacPherson. He submitted his photographs to international exhibitions including the Paris Exposition of 1855, as well as London, Edinburgh, and Dublin. His work garnered favorable notice for the size, composition, and technical merit. After his death in Rome in 1864, the Cuccioni firm continued to produce photographic views and to reprint his negatives. In the 1880s, the firm offered a number of his negatives as photomechanical prints in very large format (1 meter x 1/3 meter).

KATHLEEN HOWE

CUNDALL, JOSEPH (1818–1895)

English painter, photographer, and publisher

Joseph Cundall first exhibited at the 1852 exhibition at the Society of Arts, London. From 1853-1858, he was an exhibitor under his own name. Thereafter, his work was successively illustrated under the names of the partnerships 'Cundall & Howlett,' 'Cundall, Howlett & Co.,' 'Cundall, Howlett & Downes,' 'Cundall & Downes,' and 'Cundall, Downes & Co.' He was both a photographer and a publisher.

Cundall trained as a painter, and experimented with the calotype in the 1840s, joining Robert Hunt, Hugh Diamond and others in the early grouping often referred to today as the 'Calotype Club.'

Robert Howlett joined Cundall in 1855, one of their first projects being the publication of *Crimean Heroes* a portfolio of animated studio portraits of heavily armed soldiers before embarking for war.

Cundall published many books outside photography. His 1845 *Booke of Christmas Carols*, was the first in a series of 'illuminated gift books' based on mediaeval illuminated manuscripts. *The Photographic Primer* (1854) was published through his 'Photographic Institute,' while the second edition (1856) was published by Sampson Low & Son. Several other illustrated books were published by the Photographic Institute, some with Cundall's own photographs, others with images co-credited to Cundall and Delamotte.

Delamotte's *Photographic Views of the Progress of the Crystal Palace* (1855) was also published by Cundall.

JOHN HANNAVY

See Also: Hunt, Robert; Diamond, Hugh; Howlett, Robert; and Delamotte, Philip Henry.

CUNDELL, GEORGE SMITH (1798–1882), AND BROTHERS

The Cundell family came from the port of Leith, near Edinburgh in Scotland

There were four Cundell brothers: George Smith Cundell (1798–1882), a photographer scientist and politician and the author of a treatise on the Calotype process published in 1844. Joseph Cundell (1802–?) was a photographer. Henry Cundell (1810–1886) was a landscape painter and photographer. Charles Edward Cundell (1805–1880) was a painter. Three of the brothers, George, Charles and Henry, moved to work in London though Joseph, who remained in Leith, visited his brothers and took a number of photographs of London, including a view of Hampton Court in around 1847.

Members of the Cundell family appear in several photos taken by the amateur photographer John Muir Wood (1805–1892) who played a key role in the social interchange of photographs and the sharing of knowledge on processes and techniques. Some twenty photographs by the Cundell brothers were in the collection of John Muir Wood.

The Cundell brothers played a significant role in the link between photography in Scotland and in England during the 1840s.

An album of 100 Salt paper photographs taken by George Smith Cundell between 1842 and 1847 is in the Harry Ransom Humanities Research Centre, University of Texas at Austin.

ANTHONY HAMBER

CURREY, FRANCIS EDMUND (1814–1896)

Irish

Francis was born on 15 March 1814 to William and Anna Currey (nee Tappenden). His father was an agent on the Duke of Devonshire's Irish estate at Lismore Castle, County Waterford. Francis graduated from Trinity College, Cambridge and in 1855 called to the bar at Lincoln's Inn. He took over from his father as Lismore's land steward in 1839, later he was known for his kindness to victims of the 1847 Irish famine.

Currey took up photography in the early 1850s and in 1855 joined both the Photographic Society and Photographic Exchange Club. He built a darkroom at Lismore Castle where firstly he used the calotype process and later wet-collodion. He exhibited 16 small studies at the 1856 Photographic Society exhibition. His photographic studies were mostly made around the Lismore estate and included still-lives of game, flowers and plants, landscapes and portraits. He was a prominent member of the Amateur Photographic Association and received at least two certificates of excellence from them in the early 1860s.

He carried on with his photography into the 1880's, re-printing some of his earlier pictures onto platinum paper. He was agent at Lismore until 1885 when he finally retired. He died on the 6th June 1896.

IAN SUMNER

CURTIS, EDWARD SHERIFF (1868–1952)

American photographer

Edward S. Curtis is known principally for his serial, *The North American Indian*, which was published between the years 1907 and 1930 in the form of twenty separate volumes of illustrated text and twenty accompanying portfolios of photogravures. Since the 1970s, the work has enjoyed a popular revival, rescuing Curtis' name from relative obscurity. However, the Project has often met with critical ambivalence and has altogether eclipsed other segments of his oeuvre, which include significant contributions to geographical surveys, award-winning portrait and landscape photography, independently produced documentary film, cinematography for Hollywood movies, and several popular books.

Curtis' photographic career began in the 1870s, when he worked as an assistant in a St. Paul, Minnesota studio. By 1891, after a forced hiatus from the trade in order to support his family after his father's death, he became a partner in a Seattle portrait studio with Rasmus Rothi, and later, in 1893 with Thomas Guptill. An 1896 issue of *Argus* gave special mention to the success of the Curtis-Guptill partnership, and their bronze medal from the Photographer's Association of America for excellence in posing and lighting was prominently noted. In 1897 Curtis continued his studio work alone, specializing in portraits and Northwestern landscapes.

Inspired by the romantic, nineteenth century- conception of the 'noble savage,' Curtis began photographing Seattle area Indians as early as 1895. His first Native American subject is said to have been Princess Angeline, Chief Seattle's daughter. In both 1898 and 1899, Curtis won first place in the National Photographic Convention's Genre Class for his images, *Evening on Puget Sound*, *The Clam Digger*, and *The Mussel Gatherer*, all of which featured images of Native Americans. However, it was his chance rescue on Mt. Rainier of C. Hart Merriam, Chief of the U.S. Biological Survey, Gifford Pinchot, Chief of the U.S. Forestry Department, and George Bird Grinnell, an eminent ethnologist that drew Curtis down the path ultimately leading to the North American Indian Project. In gratitude for his assistance, Grinnell asked Curtis to accompany him on the E.H. Harriman Expedition to Alaska, an outing for the wealthy Harriman family that would include over 30 natural scientists and closely resembled the federally supported Western geographical surveys of the 1870s. The expedition yielded a 10-volume publication, illustrated by Curtis' photographs, which numbered over 5,000 by trip's end.

Critics have generally described Curtis' earliest images of Native Americans as commercially driven, appealing more to aesthetics and to the late Victorian appetite for the exotic than concerned with ethnographic documentation. It was George Bird Grinnell's prediction that the Indian way of life would soon disappear, during a 1900 trip to view a Sun Dance gathering of Blackfoot, Bloods, and Algonquin on the Piegan reservation in Montana that prompted Curtis to approach his work with more scientific rigor. Disease, starvation, and forced assimilation into Anglo-American culture were slowly eradicating authentic Native American customs and way of life. Although Curtis began studying theories of ethnography, he was still obligated to fund his fieldwork with salable material. He therefore photographed only those tribes that confirmed popular notions of Indian identity.

Curtis soon found that funds generated by his studio and the small grant he received from Doubleday Publishers in 1904 were not enough to defray his fieldwork expenses. A 1905 exhibition of his photographs at the Waldorf-Astoria in New York brought his work to the attention of Theodore Roosevelt, who became a life-long Curtis admirer and wrote the introduction to the series' first volume. Through a laudatory letter written to Curtis about his work, Roosevelt indirectly facilitated a January 1906 meeting with railroad magnate J.P. Morgan, who agreed to finance Project-related fieldwork for

$15,000 per annum for five years. This allowed for the construction of a team of Native American guides and the recruitment of an on-staff ethnologist. However, Curtis was unable to find a publishing house for the serial, which sold for $3,000 a subscription, and he was subsequently forced to take on the publication and marketing of the series himself.

By the 1910s, Curtis found it necessary to raise money and renew enthusiasm for the project. Between 1912 and 1914, while only midway through the publication of the complete twenty volume series, he spent $75,000 producing a film about Kwakiutl culture, titled *In the Land of the Headhunters*. It was a commercial failure and left Curtis in debt. During this time, Curtis also wrote several books for the popular market, one of which was *Indian Days of Long Ago*, published in 1914. In 1920, after a financially ruinous divorce settlement, Curtis moved to Los Angeles and worked as a cameraman for Cecil B. de Mille on several films, including *The Ten Commandments* before returning to fieldwork in 1921.

Over the thirty years Curtis worked on the *North American Indian* project, he traveled 400,000 miles, made 40,000 photographs, studied nearly 80 tribes in the western United States, Canada and Alaska, and transcribed, with the help of his linguistically talented ethnologist, Seattle newspaper reporter, William E. Myers, 350 myths and legends, 75 languages, and some 10,000 pieces of music. The total cost of the Project ultimately ran to over $1.5 million dollars.

While lionized by the popular media for his aesthetic sensibility, technical prowess and the regality with which he captured an enervated and 'vanishing' culture, Curtis' work also met with a host of denunciations from ethnographers regarding its authenticity, casting him as a dubious figure in contemporary studies of photography and ethnography. Curtis believed that the most truthful depictions of Indians were those manifesting no vestiges of Anglo interference. He therefore manipulated his images through the process of photogravure or by burning or crosshatching away with the retouching stylus elements not commonly recognized as part of indigenous Native American culture. He also posed his sitters and provided them with props, which may not have been part of their tribe's customary dress or natural demeanor. With his knowledge of ethnology largely self-taught, Curtis still operated under a generic conception of Native American 'otherness,' which critics feel is evinced by the North American Indian representations.

By 1930, with the publication of volume XX, the *North American Indian* project was complete. With less than 300 subscriptions sold, the bankrupt North American Indian Corporation dissolved and the project, dubbed by the *New York Herald* in 1907 as "the most gigantic undertaking in the making of books since the King James edition of the Bible" ultimately met with little critical or public fanfare. The Moroccan leather, Japanese vellum and Van Gelder etching stock used for each volume made the cost of each set prohibitive, and America, mired in the depths of the Great Depression, had long since turned its gaze away from the romanticized conception of the West. Plagued by exhaustion and depression, Curtis landed in a Denver osteopathic clinic in 1932. Four years later, he returned to Los Angeles, where he worked for Cecil B. de Mille on *The Plainsman*, starring Gary Cooper. The 1940s brought a flush of enthusiasm for new projects, and Curtis began another mammoth historical chronology on gold mining, which was never completed. Although suffering from the bodily injuries sustained while conducting fieldwork, Curtis remained mentally active and productive until his death on 21 October 1952.

Savannah Schroll

Biography

Edward Sheriff Curtis was born in February 1868 in Whitewater, Wisconsin, the eldest son of Reverend Johnson Curtis. In 1887, after moving to the Washington territory, Curtis' father died and Curtis was forced to support the family through clam digging, farming, and odd jobs. He purchased his first photographic studio in Seattle in 1891 and married Clara Phillips one year later. In 1898, he rescued three scientist-explorers, Grinnell, Merriam, and Pinchot on Mt. Rainier and was consequently invited to join the Harriman Alaska Expedition as its official photographer. Using his own monetary resources, Curtis formally embarked on The North American Indian Project in 1901. Impressed with Curtis' work and the enthusiastic endorsement given Curtis by President Roosevelt, J.P. Morgan agreed to provide financial support for the Project for five years in January 1906. Volume I was published in 1907. Volumes II and III were published in 1908. Volumes IV and V were published in 1909. Volumes VI, VII, and VIII were issued in 1911. Volume IX was published in 1913. To generate capital and renew public interest in the Project, Curtis produced the film *In the Land of the Headhunters* between 1912 and 1914. In 1915, Volume X was published, and Volume XI was released in 1916. In the same year, Curtis' wife Clara filed for divorce, citing spousal neglect. The divorce settlement was final by 1919, and, as Clara was awarded Curtis' studio, Curtis and his daughter Beth smashed his glass-plate negatives so that she could not profit further from them. In 1920, Curtis moves to Los Angeles, opened a new photo studio, and worked briefly for Cecil B. de Mille on the *Ten Commandments*. In 1922, Volume XII was

Curtis, Edward Sheriff. Susie Little-Hoopa Medicine Woman. *The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.*

published. Volume XIII and XIV were issued in 1924. Volumes XV, XVI, and XVII were published in 1926. In 1927, accompanied by daughter Beth, Curtis made a perilous trip to Northern Alaska to obtain material for volume XX. Upon his return, he was arrested for failure to pay alimony for over seven years. In 1928 volume XVIII was published, and in 1930, volumes IXX and XX were issued. Curtis returned to work for Cecil B. de Mille on *The Plainsman* in 1936 and died of heart failure at the home of his daughter Beth in Los Angeles on 21 October 1952.

See Also: Ethnography; Photogravure; and Itinerant Photographers.

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CUTTING, JAMES AMBROSE (1814–1867)

American inventor

The history behind the legend 'Cutting's Patent,' found embossed into the matte of several American ambrotype portraits, reveals a fascinating story of mid nineteenth century photography.

Cutting, born in Haverhill, Massachusetts, was a self-styled inventor, originally best known for his patent beehive which attracted a lot of publicity, and some considerable wealth. However, by the 1850s, the beehive business having failed, he had turned his attention to photography, originally taking daguerreotype portraits, but then, in 1854, opportunistically, took out American patents for collodion positive images. Tradition has it that the term 'ambrotype'—used in America as an alternative to Archer's 'collodion positive' derives from Cutting's middle name. 'Ambrotype' is now the universally recognised term.

The process was actually invented in England by Archer and Fry but not patented. Their decision allowed Cutting to submit three loosely worded patent applications (US Patent Numbers 11,213, 11,266 and 11,267) which offered only slight modifications of the original process. He quickly disposed of his patent rights, but his name remained associated with them.

One of his 'improvements' to the collodion positive involved sealing the image and its cover glass using Canada balsam as a means of eliminating oxidation. Ironically, the tendency of the balsam to attract moisture caused many of the images sealed in this way to develop fungal growths.

Cutting later opened a famous aquarium in Boston, and died in poverty in Worcester Massachusetts in 1867.

John Hannavy

CUVELIER, ADALBERT-AUGUSTE (1812–1871) AND EUGÈNE-ADALBERT (1837–1900)

French photographers, father and son

Adalbert Cuvelier was a well-to-do merchant in the northern French city of Arras, a refiner of vegetable oils and sugar by profession, but also an amateur painter and photographer. Only a few dozen of his photographs survive (notably at the Bibliothèque nationale de France, Paris) but these give ample evidence of the technical proficiency and artistic vision that won him the respect of his fellow painters and that provided the foundation for the photographic work of his son, Eugène. Adalbert's surviving photographs were made in and around Arras in the early 1850s and include views of the town's main square, rustic huts, and farmyard still-lifes, as well as a series of portraits that are unusual in their celebration of the common man.

Because his impressive photographs have rarely been seen, Adalbert Cuvelier is better known to art historians for having introduced the cliché-verre process to the painter Camille Corot, whom he befriended in April 1852, and for having printed Corot's cliché-verre plates. In the early 1860s, Eugène Cuvelier in turn introduced cliché-verre to the principal painters of Barbizon, among them Charles-François Daubigny, Paul Huet, Jean-François Millet, and Théodore Rousseau, guided them through the process, and printed their compositions. Although the Cuveliers were thus the catalysts for a brief flowering of this hybrid technique of photographic printmaking, only a single cliché-verre by Eugène, and none by his father, survives. Rather, it is their extraordinary photographs that had a greater aesthetic influence on their fellow painters and that now constitute their more lasting artistic legacy.

Eugène was a teenager when his father first took up photography, and he undoubtedly learned to make pictures at his father's side. A few photographs are inscribed "E.C. 1852" suggesting that Eugène was already taking accomplished pictures by the age of fifteen, but these photographs appear, instead, to have been made by Adalbert, initialed "A.C.," and only later changed to bear the initials of the son; perhaps the two worked side-by-side and Eugène rightfully claimed a part of their creation. He also studied art with the period's two principal painters in Arras—Constant Dutilleux and Xavier Dourlens (although in truth, smoking, drinking, and singing seem to have been as common in Dourlens's atelier as artistic instruction). Despite Cuvelier's teenage ambition to be a painter, at twenty-one he described his trade as "mécanicien" (mechanic or engineer); he designed and built a small steamboat, a machine gun, and small working models of a steam-driven locomobile and a Crampton locomotive. In all these endeavors Cuvelier worked in a time when science and art were not opposed, and photography was the perfect medium to merge the two.

Most of Eugène's surviving photographs date from the early 1860s, shortly after his marriage in March 1859 to Louise Ganne, daughter of the Barbizon innkeeper whose establishment was a gathering place for the pre-Impressionists. Photography appears to have been a personal rather than a professional pursuit. Aside from exhibitions of the Société française de photographie, in which Cuvelier displayed views of Barbizon, Fontainebleau Forest, and the environs of Arras in 1864, 1869, and 1870, he rarely exhibited his photographs. No evidence exists that he ever sought government commissions, operated a studio, or offered his work to the public in published form. Finally, and perhaps most significantly, the rarity of his photographs suggests a very limited printing of his negatives.

Uncharacteristically for a photographer working in the 1860s, he used paper negatives and frequently made salted paper prints—processes that his father taught him in the early 1850s. Cuvelier must have employed these slightly antiquated materials by design rather than by default, for collodion-on-glass negatives and commercially prepared albumen paper (which he also used on many occasions) were the universal norm by 1860. In choosing the more difficult and time-consuming processes typical of a decade earlier he was surely motivated by a preference for their aesthetic qualities—notably the soft, fibrous texture of paper negatives, with their tendency to mass light and shadow, and the velvety mat surface and appealing color range of salted paper prints.

The vast majority of Eugène Cuvelier's photographs were made in Fontainebleau Forest—most within an easy walk of Barbizon. By the time he arrived in the area, the 40,000-acre wood surrounding the Palace of Fontainebleau—once the site of royal hunts and, more recently, the domain of highway robbers, hermits, and isolated woodsmen—was a destination for painters and photographers. Instead of cataloguing its points of interest, however, Cuvelier's photographs capture the experience of the forest. He more often pictured a fern-edged path *leading to* the "Sully" or a lichen-covered rock *near* the "Reine Blanche" than the landmark trees themselves. Other photographs by Cuvelier show the humble subjects popular with his painter friends—the corner of a rustic farmyard, the streets of Barbizon, grapevines in a garden courtyard, and after-the-hunt still-lifes—as well as the château and gardens of nearby Fleury. In the mid-1860s, he also made photographic excursions in and around Arras (including Courances, Achicourt, Fampoux, and Rivière), where the heavily pruned trees, lakes, open fields, and other aspects of the landscape afforded possibilities different from those to be found in Fontainebleau Forest.

Cuvelier, Eugène. Fontainebleau Forest. *The Metropolitan Museum of Art, Purchase, The Howard Gilman Foundation and Joyce and Robert Menschel Gifts, 1998 (1988.1031) Image © The Metropolitan Museum of Art.*

In later life, Eugène and Louise Cuvelier retired to Thomery, a small town on the Seine just east of Fontainebleau, across the forest from Barbizon. Eugène died in 1900, at the age of sixty-three, and Louise four years later. Hélène, their only child, who was born in 1860, married late in life and died without children in 1905. Most of the family papers and possessions are said to have been destroyed in World War I.

Adalbert and Eugène Cuvelier were known to art historians for their connection with the cliché-verre, but few of their works were identified until recently. Only in 1962 was a landscape photograph first recognized as having been made by Adalbert (Scharf, Aaron, "Camille Corot and Landscape Photography," in *Gazette des Beaux-Arts*, ser. 6, 59 [February 1962], 99–102.) Eugène's photographs were slightly better known: a handful of beautiful salted paper prints were donated to the Bibliothèque nationale by Paul Blondel in 1924, and by mid-century a few others were collected by specialists in nineteenth-century French photography. Only in the late 1980s and 1990s, however, did the majority of the Cuveliers' best prints surface. More than one hundred photographs by both father and son were found by the descendants of Louise Ganne's sister, Victoire; many of these, including Adalbert's most impressive works, were bought by the Bibliothèque nationale, with the rest finding their way to various collectors and institutions in Europe and America. A second large cache of photographs by Eugène Cuvelier was discovered in 1989 in a packing crate—along with seascapes by Gustave Le Gray and landscapes of the American West by Carleton Watkins—and was sold at a country auction in New England, leading to the speculation that the photographs were collected and brought home by one of the many American painters who traveled to Barbizon in the early 1860s. We now know more than 250 images by Eugène—over half of his oeuvre, to judge by the numbers inscribed on his negatives.

Adalbert and Eugène Cuvelier were the subject of an exhibition at The Metropolitan Museum of Art in 1996. A related exhibition of photographs by Eugène was organized by the Staatsgalerie Stuttgart and exhibited there and at the Musée d'Orsay, Paris, in 1997.

MALCOLM DANIEL

Biography

Adalbert-Auguste Cuvelier was born in Arras, March 2, 1812 and died in Boisleux-au-Mont, February 15, 1871. Adalbert's son, Eugène-Adalbert Cuvelier, was born in Arras, April 6, 1837. He learned photography from his father, and studied painting as a teenager. On March 7, 1859, he married Marie-Louise Ganne, daughter of the innkeeper at Barbizon. He made the majority of his photographs in Barbizon and the nearby Fontainebleau Forest in the half dozen years following his marriage. Cuvelier died in Thomery, near Fontainebleau, on October 31, 1900.

See Also: Bibliothèque Nationale; Société Française de Photographie; Salted Paper Prints; Le Gray, Gustave; and Watkins, Carleton.

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CYANOTYPE

During the brilliant summer of 1842, Sir John Herschel was experimenting with highly-coloured, light-sensitive chemicals, when in June, following a suggestion by Dr Alfred Smee, he chanced upon a novel process for printing photographs in Prussian blue—a pigment already familiar to painters for over a century. Herschel called his process Cyanotype, which was negative-working in its simplest form. He also devised a positive-working version, but this presented difficulties that were partially solved in 1877 by Henri Pellet. Herschel published his processes in 1842, without restraint by patent, like all his photographic inventions. Cyanotype did not begin to enjoy wide use, however, until 1872, the year following Herschel's death, when it was taken up commercially by Marion and Company of Paris, who bestowed upon it the proprietary name of "Ferro-prussiate," and marketed a paper chiefly for copying plans in drawing offices. Thus the word "blueprint" entered our language, to describe the first reprographic process, with its advantages of low material cost compared with silver photography, and a simplicity of processing that required nothing but water. The manufacture of blueprint paper grew rapidly into a profitable industry, becoming the dominant process of reprography for the next 80 years.

Cyanotype is just one of several iron-based processes for positive printing invented by Herschel in 1842. The key to them all is the light-sensitive substance, ammonium ferric citrate, which was then being promoted by pharmacists as an iron tonic. This salt is mixed, in ca.20 per cent aqueous solution, with ca.16 per cent potassium ferricyanide, to make the sensitizer for coating plain paper. On exposure to sunlight, the ferric salt is reduced to the ferrous state, which then combines with the ferricyanide to yield Prussian blue (also known as Turnbull's blue)—which is not ferrous ferricyanide, as was long-believed, but ferric ferrocyanide. Ammonium ferric citrate is an ill-defined substance, with no precise formula, and Prussian blue also varies in composition, so the following chemical equations representing these two reactions are necessarily approximate:

Illustration

UV light + $2Fe^{3+}$ + $C_6H_6O_7^{2-}$ → $2Fe^{2+}$ + $C_5H_6O_5$ + CO_2

UV light + ferric + citrate → ferrous + acetone + carbon dioxide

ions ions ions dicarboxylic acid

Fe^{2+} + $K_3[Fe(CN)_6]$ → $KFe[Fe(CN)_6]$ + $2K^+$

ferrous + potassium → ferric ferrocyanide + potassium

ions ferricyanide (Prussian blue) ions

As the exposure proceeds, the image prints out in Prussian blue, but dense regions of the tonal scale reverse to pale grey (overexposure causing the formation of Prussian white, ferrous ferrocyanide, $K_2Fe[Fe(CN)_6]$), which gives the provisional image a solarized appearance. However, re-oxidation by air restores the shadow densities fully within a few hours. Because the unexposed sensitizer and reaction products are very soluble, the cyanotype needs nothing more than a wash in water to complete its processing—a fixing procedure that Herschel regarded as ideal. Cyanotypes have a perfectly matte surface, with no binder layer; the monochrome blue may vary in hue, and there are numerous methods of toning the image to violet, green, brown, red, or even black, as discovered by John Mercer in the 1850s. Like all iron-based processes, cyanotype has a very low sensitivity to light and can only be used for making contact prints and photograms.

Herschel used his invention to copy steel engravings and scientific notes, but it was taken up chiefly by botanical illustrators for making photograms of plant specimens; the first and most celebrated practitioner of "autobotanography" was Anna Atkins, a friend of the Herschel family, one of the first women photographers, and the author of the world's first book illustrated with photographs, *British Algae: Cyanotype Impressions*. Over the period 1843–61, Anna Atkins, in collaboration with her close friend Anne Dixon, hand-printed several elegant cyanotype albums of botanical and textile specimens, which have now become treasures of the early photographic canon.

As John Mercer discovered in the 1850s, the cyanotype process is also particularly well-suited for printing photographs onto cotton textiles: the sensitizer is cheap and non-toxic, processing is easy, and the absence of any binding agent ensures that the fabric remains unstiffened, and can drape in a natural fashion. In the 1890s a company existed in North America to print clients' photographs as cyanotypes onto pillow covers, quilts, and other soft furnishings.

Regarding the pictorial use of cyanotype, many connoisseurs experienced aesthetic difficulty with its ineluctably blue images. In Britain, Peter Henry Emerson set the tone with his acerbic dictum: "No one but a vandal would print a landscape in red, or in cyanotype." The English photographic establishment deemed cyanotypes to be inferior, and unworthy of acquisition or exhibition. The process was largely confined to proofing the domestic negatives of hobbyist photographers. As a consequence, 19th-century pictorial cyanotypes

are almost totally absent from all the major UK collections. In contrast, some curators and practitioners in France and the USA embraced the process. The still-life photographs of Henri Le Secq printed in cyanotype are well-represented in Paris, and have survived better than his silver prints. There is also a set of fine ethnographic studies of native North Americans by Edward Curtis at the George Eastman House.

Cyanotype was used for some 19th-century documentary photographs; their subjects were large-scale engineering projects, such as the construction of the Forth Bridge (1883–90), the cutting of the Panama Canal (1888–93), and various aspects of railway and locomotive engineering. This print medium was a natural choice, in view of the availability of blueprint paper in quantity on such projects. Preparatory to their publication in a 'proper' medium, the human and animal locomotion studies by Eadweard Muybridge were proofed in cyanotype, revealing interesting details that were suppressed in the final published images. Edwin Linley Sambourne made extensive use of cyanotypes to assemble an archive of reference images for his *Punch* cartoons.

Prussian blue reacts readily with alkalies: cyanotypes are destroyed irreversibly in a few minutes by a solution of only pH 9 (corresponding to a saturated solution of chalk). To protect them, a slightly acidic environment (i.e. a pH less than 7) is paramount—a requirement which runs counter to the currently approved practices of paper conservation, where alkaline buffering against acid embrittlement is the norm. Cyanotypes also tend to fade in strong light, but this is reversed in the dark; their densities recover completely within a few days in air, provided the light exposure has not been excessive. Despite these vulnerabilities, cyanotypes are archivally stable: fine specimens have endured well from the earliest days of photography, and the process continues to attract artists today.

MIKE WARE

See Also: Herschel, Sir John; Light-Sensitive Chemicals; Smee, Alfred; Patents: Europe; Patents: United Kingdom; Patents: United States; Marion and Son, A.; Printing and Contact Printing; Photograms of the Year (1888–1961); Botanical and Plant Photography; Atkins, Anna; Book Illustrated with Photographs; Pictorialism; Emerson, Peter Henry; Still Lifes; Le Secq, Henri; Ethnography; Curtis, Edward Sheriff**;** Documentary; Muybridge, Eadweard James (Edward Muggeridge); and Sambourne, Edwin Linley.

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D

DAGUERRE, LOUIS JACQUES MANDÉ (1787–1851)

French painter, decorator, printmaker, entrepreneur, inventor, and photographer

Daguerre was born on November 18, 1787, in Cormeilles-en-Parisis to Louis Jacques Daguerre and Anne Hauterre. He later attended the public school of drawing, and perhaps apprenticed to an architect, in Orléans, where his father was a process-server in the bailiff's court. Daguerre arrived around 1803 in Paris, where his godparents, the wine merchants Louis and Marie-Louise Fromont, most likely received him.

Daguerre spent the majority of his career seeking popular support and official recognition as an artist during one of the most politically and socially complex periods in French history, living through the French Revolution, Empire, Bourbon Restoration, and July Monarchy. If his contributions to photography eventually overshadowed his work as a painter, the French government's ultimate support for the daguerreotype in 1839 nevertheless demonstrates Daguerre's ambition and entrepreneurial prowess, as well as his determination, resiliency, and political savvy. Perhaps his most significant legacy to modern art and photography was this ability to negotiate artistic and political viability with popular forms of visual art.

Although Daguerre's early years remain somewhat obscure, he began his career in Paris around 1804, when he was one of the first students to enter the painting studio of the Paris Opéra, then under the direction of Ignazio-Eugenio-Maria Degotti. He may also have been a student of Jacques-Louis David, and early biographies of Pierre Prévost (who was hired by James Thayer to paint the panoramas for his two rotundas in the Boulevard Montmartre) state that Daguerre was one of Prévost's assistants, even though extant documentation does not exist to support the claim.

Daguerre first appears in the records of the Opéra as a day laborer in December 1808 for the opera *Alexandre chez Apelle* and again in November 1809 for *Fernand Cortez*. In 1810 Daguerre served as painter of ornaments for *La Mort d'Abel*, and the same year, he and Pierre-Luc Ciceri completed the decorations for the second act of *Les Bayadères*. In 1812, Jean Baptiste Isabey, who had assumed leadership of the Opera studio in 1810, recommended Daguerre as one of the studio's four first painters. Daguerre held various posts in the painting studio through 1816, when he was named the chief decorator of the Ambigu-Comique theater. He returned briefly to the Opera studio as co-chief painter with Ciceri from 1820–22. Daguerre's most prominent work with Ciceri were the decorations for *Aladin, ou la lampe merveilleuse*, which inaugurated gas lighting at the Opéra on the rue Peletier in February 1822.

Daguerre's early paintings share much in common with the "troubadour" style exemplified by Pierre Révoil and Fleury-François Richard, the gothic interiors popularized by François-Marius Granet, and the work of various artists in the weekly salons of Ciceri, including Carle and Horace Vernet, Jean-Baptiste and Eugène Isabey, Charles-Marie Bouton, and Jean-Pierre Alaux. Despite the fact that Daguerre began his own career under the Empire, and associated with several artists in Ciceri's salon known for their "bonapartist" tendencies, he nevertheless was favored by the newly restored Bourbon monarchy. Daguerre's family was closely tied to the Bourbons through an aunt, Marguerite Dully de Chérix, who had raised his father. Upon her death in 1790, she left her fortune to Louis XVI, and Daguerre's father was placed under house arrest and was almost incarcerated during the Reign of Terror because of this will. Louis XIII purchased Daguerre's first entry into the official Parisian Salon, *Intérieur d'une chapelle de l'église des Feuillants* (1814). Daguerre remained skilled

throughout his career for employing both his art and social connections to gauge changing public taste and to curry the favor of the current regime in power.

In 1810, Daguerre married Louise Georgi(en)ne Schmit(te) (called Arrowsmith or Smith), daughter of William Schmit (called Smith), who had immigrated to France from London in 1783, and eventually served as porter for the Orléans family. During the early days of the July Monarchy, and the return of the Orléans to power, Daguerre converted to the new spirit of republicanism. He was one of the first artists to become a member of the Société libre des beaux-arts, which professed a program of conservative liberalism. Opposing both the outdated traditions of the Academy and the abandon of romanticism, this group of artists, founded by Charles Farcy of the *Journal des artistes*, supported Victor Cousin's doctrine of beauty and utility in the arts. Cousin had energized the fashionable, liberal society of the Restoration with his philosophy classes at the Sorbonne, which were discontinued in 1822, and recommenced in 1828. Seen as threatening to the politics of Charles X, Cousin's philosophy went hand-in-hand with the program of industrial progress of the July Monarchy. This program, along with the conservation of French national heritage responsible for François Guizot's creation of the Commission des monuments historiques in 1830, later played an essential role in state support of the daguerreotype. During the Restoration, Daguerre catered to a slightly liberal public that came into power and prestige under the July Monarchy. In this way, he survived not only the change of political power, but personal bankruptcy as well.

Daguerre was also among the first French artists to experiment with lithography, registering two lithographs, printed by Charles Motte, on 20 June 1818: *Souterrain exécuté pour l'Ambigu Comique 1817* and *Citerne en ruine à Montmartre*. In 1819, his lithograph *L'Entrée de l'église du St. Sépulcre* for Count Auguste de Forbin's *Voyage dans le Levant*, was shown at the Salon. In 1820, Daguerre contributed to the first volume of Charles Nodier and Baron Isidore Taylor's *Voyages romantiques et pittoresques dans l'ancienne France*. His lithograph *Ruines de l'abbaye de Jumièges* (Ancienne Normandie, t. I, pl. 12) was shown by the printer Godefroy Engelmann in the Salon of 1822. Between 1820-33, Daguerre contributed (preparatory drawings or lithographs) to a total of 11 plates for successive volumes of this publication, including Ancienne Normandie, t. II, 1825; Franche-Comté, 1825; and Auvergne, t. I, 1829 and t. II, 1833. His theater decorations for Victor Ducange's *Elodie*, presented at the Ambigu-Comique in 1822, were popularized by the lithographer Jean-Philippe Schmit and shown in the Salon of 1824.

Daguerre was best known as the entrepreneur and creator of the Diorama, which he organized as a limited stock company in 1821 with his partner Bouton. The society was registered under the name "Bouton, Daguerre et Cie" on January 3, 1822, with shareholders including Jean-Baptiste Isabey and the Count Charles de Clarac, the curator of antiquities at the Louvre. In 1823, Daguerre formed a second society with the printer James Smith to exploit the Diorama in London under the supervision of John Arrowsmith. Daguerre and Bouton jointly directed the Paris Diorama until September 1830, when Bouton left the society for declared health problems. Despite his declaration of bankruptcy in 1832, Daguerre continued as sole director of the Paris Diorama until it burned down on 8 March 1839.

The Diorama was a building designed by Daguerre that housed two large, semi-transparent paintings illuminated by natural light. Inspired by the success of the panoramas, as well as the transparent paintings of Louis Carmontelle and Franz-Niklaus Kœnig, Daguerre and Bouton employed blinds and colored screens to represent natural effects of time, light, and movement in contrasting interior and exterior views. The public, seated in a central auditorium, was transported from one scene to the next by means of a rotating viewing platform. On rare occasions, Daguerre used the Diorama as a venue to capitalize on current political events in order to win political favor, as with the *Vue de Porte Sainte-Marie* (1824), which depicted the Duke d'Angoulême (son of the future Charles X) meeting Ferdinand VII in Spain during the French effort to restore the absolutist Spanish monarch to the throne. Shortly after the Duke d'Orléans assumed the throne as King Louis-Philippe, Daguerre depicted the taking of the Hôtel de Ville during the spontaneous insurrection of French citizens and the National Guard against the army on 28 July 1830. In 1834, Daguerre and his student Hippolyte Sébron developed the double-effect diorama. Like the earlier diorama pictures, the double-effect paintings featured temporal and climatic changes, but were also episodic; the paintings represented events or scenes that often included the appearance of figures, painted on the back of the canvas, which were only visible when lit from behind. In *The Inauguration of the Temple of Solomon* (1836), for instance, a nighttime scene of a deserted architectural setting was gradually transformed into a magnificent, candelabra-lit golden temple in which viewers eventually saw thousands of people celebrating the dedication of the temple.

Although Daguerre envisioned the Diorama as a permanent public display of his work, he exhibited at three other Paris Salons as part of his program to gain official, as well as public, recognition for his art. In 1824, he showed *Chapelle d'Holyrood* and an oil sketch, *La*

Chapelle de Roslin. The same year he was awarded the cross of the Legion of Honor and Forbin, then director of the Louvre, described him as one of the most remarkable painters of the time. His 1827 Salon entry, *Village d'Unterseen en Suisse* (lost in 1848) was purchased by the Duke d'Orléans. All three of these works were also subjects of Daguerre's Diorama. The repetition of diorama subjects was not merely a commercial endeavor, but also represented Daguerre's concern with establishing his reputation as a painter outside the realm of the ephemeral and popular pictures for the Diorama. His final Salon entry, in 1834, was an original landscape, *Paysage*, and is unique in Daguerre's oeuvre for its heavily worked foreground, in which the impasto of the paint is apparent. The rugged terrain and foliage of the foreground reveal the influence of the new school of landscape represented by Théodore Rousseau and indicate the direction Daguerre's Salon painting might have taken had he continued to exhibit.

By 1834, however, Daguerre was completely occupied with experiments related to the Diorama and photography. For his diorama paintings, he had already studied different materials according to their reaction and sensitivity to light, in particular working with phosphorescent materials in a camera obscura in an attempt to produce incandescent colors. Daguerre's talent for lighting effects and illusionism, along with his solid understanding of printmaking techniques, led to the invention of the daguerreotype, the first publicly announced and commercially successful photographic process. After five years of joint experimentation with Joseph Nicéphore Niépce, Daguerre produced his first daguerreotypes as early as 1834 and announced the invention in the *Journal des artistes* on 27 September 1835. The daguerreotype is a photographic image with a mirror-like surface on a silver or silver-coated copper plate. A unique photograph, the daguerreotype is not produced from a negative, and the final image appears either positive or negative depending on the angle of reflected light.

Daguerre first contacted Niépce in January 1826, after hearing about his heliographic experimentation from the optician Vincent Chevalier. Niépce eventually visited Daguerre at the Diorama in August 1827, and the two men formed a company on 14 December 1829 in order to exploit both Niépce's invention, based on the photosensitvity of bitumen of Judea, and Daguerre's improvements to the camera obscura. After Niépce's death (5 July 1833), Daguerre signed a new contract in 1835 with Niépce's son, Isidore. The new contract changed the name of the partnership from "Niépce-Daguerre" to "Daguerre and Isidore Niépce," in light of Daguerre's recognition of the chemical bases of the daguerreotype, iodine and mercury. A final contract was signed in 1837, naming Daguerre as the sole inventor of the new process, which was announced by the politician and scientist, François Arago, on 7 January 1839. Arago formally divulged the process to a joint meeting of the Académie des Sciences and Académie des beaux-arts on 19 August 1839, after King Louis-Philippe signed the law granting lifetime pensions to Daguerre and Isidore Niépce on 7 August 1839.

According to the terms of the law, Daguerre was required to publish details of the daguerreotype process and techniques for painting diorama pictures. In addition to Arago's public explanation of the technical production of daguerreotypes, Daguerre produced an illustrated manual outlining the various steps of the process. Daguerre added his correspondence with Niépce, in which he suggests experimenting with the photosensitivity of silver and iodine, in order to demonstrate that the daguerreotype was indeed his own invention. The cited letters—which document the fact that Daguerre's systematic experiments with silver nitrate, and eventually mercury, led him to the discovery of his own photographic process—only revealed part of the picture. In fact, Niépce already had used iodine, but only as a kind of "developing agent," to darken the shaded parts of his proofs. Daguerre's claims in the manual angered Niépce's son, Isidore, who responded with his own pamphlet, in which he asserted that his father invented the daguerreotype.

Following Arago's announcement, Daguerre sent daguerreotypes to Ludwig I of Bavaria, Ferdinand I of Austria, Nikolaus I of Russia, Friedrich Wilhelm III of Prussia, the Austrian chancellor Klemens Metternich, and Austrian ambassador to France, A.G. Aponyi. Daguerre also offered daguerreotypes to Arago and Alphonse de Cailleux. These dedication plates, like many of the images the first generation of photographic artists produced, comprised views of Paris and still-life arrangements of plaster casts, architectural fragments, bas-reliefs, and copies of sculpture. Daguerre's earliest extant daguerreotype is generally considered to be the still life presented to Cailleux, which includes a bas-relief after Jean Goujon. Georges Potonniée, who first exhibited the plate in 1920, dated it to 1837 based on an inscription that is no longer visible. The image itself is now almost completely faded, as is the case with many of Daguerre's earliest daguerreotypes. The state of many of these early plates, along with lack of documentation, accurate provenance, and conservation studies, renders precise dating, as well as firm attribution, difficult at best. For these reasons, the date and identification of Daguerre's earliest portrait daguerreotype remains a debated topic.

After Arago's disclosure of the daguerreotype process, Daguerre gave a series of public demonstrations in

September of 1839, in addition to weekly consultations to daguerreotypists at the Conservatoire des Arts et Métiers. He also supervised daguerreotype production at the shop of Alphonse Gustave Giroux, the son of his art dealer and the first manufacturer of daguerreotype equipment. In 1840, Daguerre retired to the village of Bry-sur-Marne. While he continued to work on the daguerreotype, periodically sending news of improvements to Arago, photography was no longer his affair. He painted his last diorama for the church of St. Gervais-St. Protais at Bry in 1842. In 1848, he constructed a natural grotto in the park at Bry, returning to the source of his original inspiration, the landscape. He died on 10 July 1851, the same year he was planning another religious diorama painting, a cavalry, for the church at Perreux, in the neighboring town of Nogent-sur-Marne.

STEPHEN C. PINSON

Biography

Louis Daguerre was born 18 November 1787 in Cormeilles-en-Parisis, France and attended public school in Orléans before moving to Paris around 1803. In 1808, he appears in the official records of the painting studio of the Opéra, where he held various posts through 1816, when he was named the chief decorator of the Ambigu-Comique theater. He returned briefly to the Opera studio as co-chief painter with Pierre-Luc Ciceri from 1820–22. Daguerre also exhibited five paintings in the official Parisian Salon, was among the first French artists to experiment with lithography, and was the entrepreneur of the popular spectacle known as the Diorama, which opened in Paris in 1822. On 14 December 1829, Daguerre formed a company with Nicéphore Niépce in order to exploit Niépce's invention of heliography, and Daguerre's improvements to the camera obscura. After Niépce's death (5 July 1833), Daguerre signed a new contract on 9 May 1835 with Niépce's son, Isidore. The new contract changed the name of the partnership from "Niépce-Daguerre" to "Daguerre and Isidore Niépce," in light of Daguerre's recognition of the chemical bases of the daguerreotype, iodine and mercury. A final contract was signed on 13 June 1837, naming Daguerre as the sole inventor of the new process, which was announced by the politician and scientist, François Arago, on 7 January 1839. Arago formally divulged the process to a joint meeting of the Académie des Sciences and Académie des beaux-arts on 19 August 1839, after the purchase of the process by the French government. In 1840, Daguerre retired to Bry-sur-Marne, where he painted his last diorama for the church of St. Gervais-St. Protais in 1842 and died on 10 July 1851.

See also: Daguerreotype; Arago, François Jean Dominique; Niépce, Joseph Nicéphore; and History: 2. 1826–39.

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DAGUERREIAN JOURNAL (1850)

When the first issue of *The Daguerrean Journal* appeared on November 1st 1850, American photographers experienced their first specialist journal devoted to the new art, and the world welcomed the first commercially produced photographic magazine. It was not, strictly speaking, the first journal to promote the daguerreotype—that goes to John Plumbe's short-lived publication *The Plumbean* in the late 1840s, but in terms of a widely published and distributed periodical, *The Daguerrean Journal* was an undoubted first.

The editor and publisher was Samuel Dwight Humphrey, born in Hartland Connecticut, himself a daguerreotypist in New York with several years experience, and already by that time, co-author with M. Finley of the 1849 manual on the process, *A System of Photography Containing an Explicit Detail of the Whole Process of Daguerreotype*.

The publication's full title—*The Daguerreian Journal: Devoted to the Daguerreian and Photographic Art. Also embraces the Sciences, Arts and Literature*—made Humphrey's intention explicit.

The first issue had, as its frontispiece, a portrait of Daguerre, and while a year's subscription of the twice-monthly publication was set at 'three dollars in advance' single issues could be purchased for twenty-five cents.

Initial reaction to the journal was highly positive and, at the end of its first year of publication, Jeremiah Gurney, in a letter to the editor published in May 1851, noted that "a journal, therefore, devoted as yours has been to affording so many valuable hints in the operative department of the new artist, is a most invaluable aid… …We have at once in our power the means of union and advancement. We have a medium through which, no matter how distant we may be placed, we may inter-

communicate and establish that good fellowship which should exist between all exercising a common calling… …The only hope in raising our calling is in publication and communication; the opportunity is within our grasp; and I trust when the current volume terminates its career, and that we have all been weighed in the balance, we shall not be found wanting."

Before the end of the first volume of publication, Levi Hill had made the first announcement of his achievement at producing daguerreotypes in what he stated were natural colours. So impressed was Humphrey by Hill's claims that he invited him to become co-editor of the *Daguerreian Journal*, an offer which he quickly regretted. Hill's reluctance to detail his process brought widespread opprobrium from within the photographic community, despite his assertions that he was withholding publication until he had the process in a more perfect state. The daguerreian community, and Samuel Humphrey, quickly lost faith in Hill's claims. He was accused of trying to swindle the purchasers of his manuals, and his co-editorship of *The Daguerreian Journal* was terminated before the completion of volume two.

The journal attracted readers and contributors from Europe as well as America, including such luminaries as the leading British writer on photography, Robert Hunt, whose writings on 'Researches on Light,' 'Helichrome' and 'On the Application of Science to the Fine and Useful Arts' were all included in 1851, as was a review of his book 'Photography—a Treatise.'

After two years of successful publication, and three volumes, the *The Daguerrean Journal* name was changed to *Humphrey's Journal of the Daguerreotype and Photographic Arts*—usually thereafter referred to as *Humphrey's Journal*—a title it retained until the end of volume 13. With the exception of a brief cessation between January and march 1852, publication under this name continued until late 1863.

For volume 14 only, a further name change was introduced—to *Humphrey's Journal of Photography and the Heliographic Arts and Sciences*.

Renamed again in 1864 as *Humphrey's Journal of Photography and the Allied Arts & Sciences*, the magazine continued to enjoy success until 1870 (the end of volume 21) under the editorship of John Towler.

JOHN HANNAVY

See also: Humphrey, Samuel Dwight; Gurney, Jeremiah; and Towler, John.

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DAGUERREOTYPE

The daguerreotype process—the first practical means of capturing a lasting image by a photochemical reaction—was developed in France in the 1820s and '30s by Joseph-Nicéphore Niépce and by Louis Jacques Mandé Daguerre, after whom it is named. In this process, a copper plate that has been coated with silver, polished, and sensitized is exposed to light and then chemically treated to produce and fix a single positive photographic image. The finely detailed picture that results from the process alternately appears to its viewer as a positive or a negative, depending on the angle of light in which the cased mirror-like plate is held. The first daguerreian cameras reversed the image from right to left from the original perspective; by 1840, the introduction of mirrors in place of, or in addition to, lenses allowed for right-reading images. Initially, the long exposure time required to produce a daguerreotype inhibited its use for portraiture, but by the early 1840s, important chemical additions to the process and improvements in camera- and lens-making allowed daguerreotypy to be used for imaging human subjects. Its accuracy, relative rapidity, and affordability made daguerreotypy the dominant form of photography until the 1850s, when it was supplanted by negative-to-positive processes that produced and reproduced images more easily and inexpensively.

Daguerre's Process

Daguerre's original process involved several complicated steps that exceeded the capacities of most curious amateurs. First, a sheet of copper was carefully coated with a thin layer of silver, then cleaned and polished. The characteristic reflectivity of the daguerreian plate's mirror-like surface was achieved using an abrasive mixture of pumice and oil that was washed from the plate with nitric acid and water.

In a darkened room, the polished plate next was sensitized through exposure to iodine flakes in a specially designed box until a chemical reaction introduced a thin layer of silver iodide on the silvered surface, turning it a bright golden color. Once placed in a plate holder and covered with an opaque protective slide, the plate was ready for exposure in a camera. These early cameras were relatively simple: they consisted of a lightproof wooden box within another box that had been fitted with a ground glass, a mirror, and a brass tube containing a

lens. Daguerre's original camera used a meniscus, or simple convex-concave, lens.

In preparation for taking the picture, the camera's lens was focused and capped and the plate holder inserted into the camera. In place of a shutter, the protective opaque slide was pulled away from the plate and out of the camera and the lens cap removed to begin the exposure. The first daguerreotypes could require twenty minutes or longer of exposure, depending on light conditions. Once the estimated exposure time was reached, the lens cap and protective slide were replaced and the plate holder removed from the camera and returned to a darkroom for development.

In the darkroom, the plate was suspended face-down in a box containing a small amount of mercury that had been heated to 120 to 180 degrees Fahrenheit by means of a spirit lamp to distribute it evenly across the bottom of the box. Mercury vapors chemically reacted with areas of the silvered plate that were exposed to light. The daguerreotypist examined the plate at intervals to check the progress of the developing latent image.

Once the picture was visible and the contrast in its light and dark tones deemed satisfactory, it was bathed in a heated solution of salt or "fixed" in a bath of sodium thiosulfate, or "hypo," for approximately thirty seconds to remove the sensitized chemicals that remained on the plate. The hyposulfite was then rinsed off with water and the plate carefully dried to avoid spotting. The finished plate was then enclosed behind glass in a protective frame.

Development of the Daguerreotype Process

In the early nineteenth century, a number of artists, scientists, and amateurs simultaneously were experimenting with various chemicals, surfaces, cameras, and lenses to fix a permanent image that was generated by light instead of by an artist's hand. In England, Thomas Wedgwood, Sir Humphry Davy, and William Henry Fox Talbot were working to print such images on paper, and in France, Nicéphore Niépce and Daguerre each were searching for a means of capturing pictures on metal plates. Daguerre had turned to photographic experimentation after the popular and profitable exhibition of his diorama paintings in Paris. These large-scale, semi-translucent canvases featured *trompe l'œil* paintings illuminated with various lighting effects to give the illusion of passing time. Having used a camera obscura to create his paintings, Daguerre became interested in devising a method to capture the camera's projections. In 1826, he learned from the Parisian opticians Charles and Vincent Chevalier that another of their clients, Niépce, had been using bitumen of Judea to print images on pewter. Daguerre wrote to Niépce to inquire about his process, which Niépce had named *heliography*. The two began a tentative correspondence, with each reluctant to divulge the extent of his progress to a rival. In late 1829, after concluding that their independent work could advance more quickly in collaboration, Niépce and Daguerre became partners. When Niépce died three and a half years later, his son Isidore succeeded him in the partnership; Daguerre continued experimenting.

By 1837, Daguerre's progress in stabilizing the photographic process was such that he revised the original terms of the partnership that had designated Niépce as the inventor of the process and Daguerre as its improver to give himself the primary role. He had happened upon a combination of common salt, silver, iodine, and mercury that finally succeeded in developing a latent photographic image and permanently fixing its subtle shades on a copper plate. Seeing the potential profit in the improved process, Isidore Niépce acquiesced to Daguerre's terms. In attempting to sell his findings to subscribers in France and abroad, Daguerre approached François Jean Dominique Arago, director of the Paris Observatory, permanent secretary of the French Academy of Science, and a member of the French Parliament's Chamber of Deputies. Having experimented himself with light-sensitive materials and with means of measuring the effects of light's intensity, Arago immediately recognized the commercial, scientific, and artistic potential of Daguerre's process. At the 7 January 1839 meeting of the Academy, Arago proposed that "the Government should compensate M. Daguerre direct, and that France should then nobly give to the whole world this discovery which could contribute so much to the progress of art and science" (qtd. in Gernsheim, 1968, 84). In July 1839, the French government passed bills awarding Daguerre and Niépce an annual pension of six thousand and four thousand francs, respectively, in exchange for a detailed history and description of the promising daguerreotype process. For the additional two thousand francs, Daguerre also was asked to reveal the secrets behind the realistic effects of his diorama paintings.

The Public Introduction and Adoption of Daguerreotype

In keeping with Arago's hopes and with Daguerre's and Niépce's agreement with the French Government, the daguerreotype process was introduced to the public at a joint open meeting of the Academies of Science and of the Fine Arts on 19 August 1839. In front of a rapt crowd that filled the Academy's halls and courtyard, Arago detailed, but did not demonstrate, the necessary equipment and procedures on Daguerre's behalf. The

Ford, James. Portrait of a Boy with Gold-Mining Toys.
The J. Paul Getty Museum, Los Angeles
© The J. Paul Getty Museum.

response to the announcement was overwhelming. According to one account, only an hour after Arago's lecture, all the opticians' shops were besieged, but could not rake together enough instruments to satisfy the onrushing army of would-be daguerreotypists; a few days later you could see in all the squares of Paris three-legged dark-boxes planted in front of churches and palaces. All the physicists, chemists, and learned men of the capital were polishing silvered plates, and even the better-class grocers found it impossible to deny themselves the pleasure of sacrificing some of their means on the altar of progress, evaporating it in iodine and consuming it in mercury vapor" (qtd. in Gernsheim, 1968, 101).

Théodore Maurisset's "La Daguerreotypomanie," published in December 1839, offers a humorous depiction of the French public's tremendous enthusiasm for the new discovery. In the lithograph, a smiling sun shines down on a carnivalesque scene of endless multitudes seeking, posing for, purchasing, taking, and manufacturing equipment for making daguerreotypes.

Soon after Arago's lecture, Daguerre wrote a pamphlet entitled *Historique et description des procédés du Daguerréotype et du Diorama, par Daguerre* [*A History and Description of the Process of the Daguerreotype and of the Diorama, by Daguerre*], published by Alphonse Giroux in Paris, to meet the intense public demand for more information about the process. Daguerre also commissioned lenses from Charles Chevalier to be used in cameras manufactured to his specifications and to be sold by Giroux. As word of the daguerreotype spread beyond France, Daguerre's instructions were quickly translated and republished throughout the world. Yet early attempts to replicate Daguerre's success by following his procedure often resulted in disappointment, as novices found the process difficult to master. In response to these frustrations, Daguerre agreed to offer demonstrations of his process and his advice to the public.

At the first demonstration, held on 7 September 1839, an audience of nearly one hundred and twenty people observed each step of the procedure and applauded Daguerre's results after an hour and a half.

When the process was successfully carried out, the results were incomparable. As Samuel Finley Breese Morse, the American painter and inventor, marveled after viewing several of Daguerre's examples before their public release,

> [n]o painting or engraving ever approached it. For example: In a view up the street, a distant sign would be perceived, and the eye could just discern that there were lines of letters upon it, but so minute as not to be read with the naked eye. By the assistance of a powerful lens…every letter was clearly and distinctly legible, and so also were the minutest breaks and lines in the walls of the buildings, and the pavements of the streets. (qtd. in Taft, 1964, 12)

Yet as Morse noted, these first daguerreotypes were incapable of capturing any moving objects. Due to the lengthy time of exposure, the pedestrians and carriages traveling on the streets in Daguerre's 1838 picture of the Boulevard du Temple in Paris were rendered invisible, with the exception of a man having his boots polished by a bootblack. Because both men remained stationary for the duration of the exposure, they are the only traces of any human presence in the otherwise desolate scene.

This initial shortcoming and the difficulty of the process, however, did not hinder the documentary potential of the daguerreotype. In the same year that the process was revealed to the public, Noël Marie Paymal Lerebours, an optician and publisher, solicited and commissioned over a thousand scenic daguerreotypes of important historical sites around the world. His *Excursions Daguerriennes*, published between 1840 and 1844, featured one hundred and fourteen copperplate engravings taken from daguerreotypes of locations ranging from Paris to Moscow and Algeria to Niagara Falls.

In detailing the range of potential uses for the daguerreotype, Arago also predicted that it would "procure for [the artist] an increase in work" conducted "less in the open air, and more in his studio" and would "provide physicists and astronomers with very valuable methods of investigation," thus benefiting art and science alike (qtd. in Gernsheim, 1968, 83). By mid-century, the accuracy and detail of the daguerreotype led to the word's broadened popular use as a metaphor for a precise and vivid description, whether of objects, people, or memories.

As knowledge and the practice of daguerreotypy spread throughout the world, an important potential rival to the process emerged in England. Upon hearing of Daguerre's research in early 1839, Talbot presented examples of his efforts to capture photographic images on paper to the Royal Society in London in an effort to protect the integrity of his own discoveries. Significantly, Talbot's initial "photogenic" process and its successor, the calotype, or talbotype, produced a negative image from which multiple positives could be printed—a distinct advantage over the necessarily singular daguerreotype, and a first glimpse of a photographic process that would come to dominate from the mid-nineteenth through the late-twentieth century. But because Talbot was printing on paper rather than on metal plates, his process yielded less precise images that did not differ as drastically as did Daguerre's from lithography and other manual forms of printing. As Sir John Herschel complained of Talbot's process to Arago, "compared to the masterful daguerreotype, Talbot produces nothing but mistiness" (qtd. in Newhall, 1964, 33). What is more, Talbot's efforts to enforce a patent on his process significantly restricted its initial use. For these reasons, the finely detailed surface of the daguerreotype and the publicly available details of its manufacture became more significant than its comparative limitations, leading to its wider adoption and dominance until the rise of the wet collodion process in the 1850s.

Innovations in the Daguerreotype Process

The desire to put the daguerreotype to use for making portraits led to international experiments with, and significant improvements in, Daguerre's original process and equipment. Cameras featuring double lenses with a larger aperture and a shorter focal length, designed by Josef Petzval and built by Peter Voightländer in Vienna, offered reduced exposure times better suited to portrait photography. In America, Alexander S. Wolcott and John Johnson introduced a camera in 1840 that used mirrors instead of lenses to focus light on a small daguerreian plate, also shortening exposure times, with the added benefit of avoiding the reversed image of early lens cameras. By the mid-1840s, various manufacturers in Europe and America were selling cameras that were more compact and more portable than Daguerre's original camera.

While daguerreotype plates initially were coated with silver and sized by individual daguerreotypists, newly formed supply companies in France and America began offering pre-prepared plates and other materials specific to the emerging trade. A full sheet, or a "whole plate"—the largest size that fit in a standardized daguerreotype camera—measures approximately six and a half by eight and a half inches. Whole plates were divided into smaller sizes and offered to customers at lower prices, resulting in the typical half-, quarter-, sixth-, ninth- and sixteenth-plate options. In the mid-1840s, American daguerreotypists began adding to the layer of silver on their purchased plates with electroplating, or "galvanizing,"

in which the daguerreotype plate and a block of silver were attached to two separate wires and suspended in a container of potassium cyanide. When the wires were then connected to a wet battery, molecules of silver were transferred to the plate through electrolysis. This procedure became known as the "American process" and was adopted by French plate manufacturers in the 1850s as the new standard for the preparation of daguerreotype plates.

Newly developed tools and methods for polishing the silver-coated plates were introduced into the revised process as well. Abrasive powders such as iron oxide and decomposed limestone, fine pumice stones, buckskin- and silk-covered buffing blocks and wheels, and jeweler's rouge were used to bring plates to a mirror-like shine. Careful polishing with such materials was essential to ensuring that the silver coating was entirely smooth and that the appearance of lines any other visible imperfections was minimized.

Further experiments with the chemical sensitization of the polished plate resulted in the introduction of additional steps into Daguerre's original process. In late 1839 in Philadelphia, Robert Cornelius, the son of a plated goods manufacturer, and Dr. Paul Beck Goddard, a chemist, first used bromine as an accelerator in the sensitization process. Other innovators, like John Frederick Goddard (an Englishman of no relation to the American Goddard) and Franz Kratochwila (a Polish civil servant), experimented with bromine as well. Antoine Claudet (a Frenchman working in London) developed a technique for using bromine and chlorine as accelerated sensitizing agents. This multi-phase sensitization of the daguerreotype plate, in combination with the larger aperture lenses used in cameras, reduced exposure times from minutes to as little as three seconds, depending on light conditions. These significantly reduced exposure times made daguerreotypy a practical medium for portraiture.

Word of these innovations spread quickly, and daguerreotypists began exposing their iodine-sensitized plates to bromine in the second of what was now three steps in the sensitization process. Suspended face-down in a box containing a mixture of bromine and quicklime, the iodine-treated, gold-colored surface of the plate turned a silvery blue. Subsequently, the plate was briefly re-exposed to iodine and its sensitization completed. During each step, the progress of the plate's sensitization could be examined by viewing its tones through glass windows in the different coating boxes.

Additional experiments in the chemistry of daguerreotypy also improved the durability of the image on the daguerreian plate's surface. In 1840, the French physicist Louis Armand Hippolyte Fizeau discovered that washing the fixed plate with a weak solution of gold chloride that had been heated and spread over the image would enhance its tones as well as stabilize and preserve it against further chemical reactions. Daguerreotypists employed this gilding technique from its introduction to the end of the daguerreian era.

Even when gilded, daguerreotypes remained fragile and needed to be enclosed in a protective case behind glass. Mass-produced cases made of leather and, later, of an early type of plastic made from gum shellac were sold to daguerreotypists. Brass mats of different shapes and case linings of silk or velvet were added to the case to enhance the appearance of the finished daguerreotype. Customers could choose among the options in each to embellish their portraits, while daguerreotypists used stamped cases and mats to advertise their work.

A general desire for images that were both realistic and aesthetically appealing drove much of the continuing experimentation with the daguerreian process. In 1851, a daguerreotypist named Levi L. Hill in upstate New York announced that he had discovered a process for capturing vivid reds, greens, blues, and browns on the silver daguerreian plate, resulting in images that appeared even more lifelike and beautiful than the daguerreotype. There was good deal of popular excitement about the advance, and Hill advertised manuals describing his process for three dollars. Yet when Hill delayed displaying examples of his achievement in an effort to perfect and patent his process, suspicions of a hoax were raised. Upon applying for a patent, Hill testified about his process and finally displayed examples of his "hillotypes," as he termed them, to a Senate committee that concluded that he could not patent a "strictly chemical" process (qtd. in Barger and White, 41). Late-twentieth century examinations of Hill's process, as he detailed it in his 1856 *Treatise on Heliochromy* and as it can be studied through sixty-two hillotypes held by the Museum of American History of the Smithsonian Institution, have concluded that it differs significantly enough from daguerreotypy, despite Hill's use of daguerreian plates, to be considered a separate photographic process.

The Popularity and Demise of the Daguerreotype

By the mid-1840s, daguerreotype studios had been established in most of the world's major cities. The profitability of making portraits for an eager public led many people from all walks of life to take up the practice of daguerreotypy. Itinerant daguerreotypists went so far as to improvise horse-drawn and shipboard studios and in doing so, extended the practice of daguerreotypy to the far reaches of the world. In 1840 in Rio de Janeiro, the fourteen- year-old Brazilian emperor Don Pedro II was so taken with a visiting priest's demonstration of the daguerreian process that he purchased a camera and became Brazil's first photographer. In Australia, the first

daguerreian studio was opened in late 1842 on the roof of the Royal Hotel in Sydney. The first professional daguerreotypists also arrived in Mexico in the early 1840s, capturing the likenesses of wealthy families in Mexico City, of landowners in the provinces, and of traders on the coasts, despite the limited availability of the necessary chemicals and the challenging climate. By 1845, Russian daguerreotypists had succeeded in adapting the process to capture images on brass and copper instead of more expensive silver. The Canadian daguerreotypists Eli J. Palmer and Thomas Coffin Doane submitted samples of their high-quality work to the Paris Exhibition of 1855, where they were awarded honorable mention against the tough competition of the best daguerreian artists working in France and the United States.

As the ranks of daguerreotypists throughout the world swelled, some sought a commercial advantage by outfitting their studios with luxurious interiors and flattering portraits of prominent clients. Although the daguerreotype initially had been promoted as an art form made without an artist's intervention, as competition among daguerreotypists increased and prices for a portrait dropped, those who charged more for their images increasingly separated themselves from less-skilled daguerreian "operators" by designating themselves as daguerreian "artists."

In America, the studios of such noted artists as Albert Sands Southworth and Josiah Johnson Hawes in Boston and Mathew B. Brady in New York and Washington, D.C., became destinations for the nation's most eminent citizens to be daguerreotyped. At the tonier studios, a full-plate portrait could cost more than five dollars and a "mammoth" plate, measuring as much as fifteen by seventeen inches, sold for the extravagant sum of fifty dollars; however, most daguerreotypists charged a dollar or less for a sixth-plate or smaller cased picture. By the 1850s, prices had dropped to as little as twelve-and-a-half cents for two portraits taken by an ordinary daguerreotypist. The largest American studios, capable of taking as many as a thousand pictures a day, typically divided the labor of the process among several people, including a plate preparer, a camera operator, and painter who could add color tinting to the image for an additional charge. By 1849, the daguerreotypist had become such a familiar figure in American society that an article in the popular magazine *Godey's Lady's Book* declared, "In our great cities, a daguerreotypist is to be found in almost every square; and there is scarcely a county in any state that has not one or more of these industrious individuals busy at work in catching 'the shadow' ere the 'substance fade'" (qtd. in Rudisill, 1971, 199).

Even as daguerreian portraiture became a commonplace of mid-nineteenth century life, first-time visitors to a daguerreotypist's studio often were disappointed with both the experience and the result of being photographed. Comical stories of the frustrating experience of seeing oneself in a daguerreotype abound in European and American periodicals from the 1840s and '50s. Discomfited by the use of restraining head braces, by the obligation of sitting still for the time of exposure, and by the limitations on colors and patterns that one could wear while being daguerreotyped, sitters frequently complained that they appeared uncomfortable and unnatural in their portraits. Others were displeased with the detail with which the less-flattering aspects of their appearance were too-faithfully imaged. To discuss strategies for dealing with unsatisfied customers, and to publicize the latest advances in daguerreian technology, trade journals such as *La Lumière*, *The Daguerreian Journal,* and *The Photographic Art Journal* were established. Articles recommending techniques for redirecting light and for posing sitters in positions that highlighted their best features, and diminished their worst, appeared regularly in such publications alongside discussions of new equipment and processing techniques.

In England, however, daguerreotypy was less widely practiced, due to Daguerre and Niépce having patented the process there. They also authorized their patent agent to sue anyone who made, displayed, or sold daguerreotypes without permission. In 1846, only four daguerreian studios were operating in all of London. Such restrictions, along with Talbot's continuing work on negative-to-positive photography, contributed to the English development of the wet collodion process. Once photographers learned this method of producing high-quality photographic images much more quickly, easily, cheaply than the most refined daguerreian process would permit, the daguerreotype effectively was outmoded. Although it continued to be practiced with some obstinacy in the United States into the 1860s, the rest of the world largely had abandoned the daguerreian process by the mid-1850s.

Marcy J. Dinius

See also: Advertising of Photographic Products; Arago, François Jean Dominique; Books illustrated with photographs: 1840s; Brady, Mathew B.; Calotype and Talbotype; Camera Accessories; Camera design: 1. 1830s–1840s; Camera design: 2. 1850s; Cased Objects; Coloring by Hand; Daguerre, Louis Jacques Mandé; Davy, Sir Humphry; Developing; Fizeau, Louis Armand Hippolyte; Hill, Levi L.; Historiography of Nineteenth-Century Photography; History: 1. Antecedents and Proto-Photography up to 1826; History: 2. 1826–1839; History: 3. 1840s; History: 4. 1850s; Itinerant Photographers; Latent Image; Lenses: 1. 1830s–1850s; Morse, Samuel Finley Breese; Southworth, Albert Sands and Hawes, Josiah Johnson; Niépce, Joseph-Nicéphore; Petzval,

Josef Maximilian; Talbot, William Henry Fox; and Wet Collodion Positive Processes.

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DAINTREE, RICHARD (1832–1878)

Englishman Richard Daintree was born in 1832 and came to Australia for health reasons and to prospect for gold. He joined the Geological Survey of Victoria as an assistant and undertook further training at the Royal School of Mines Laboratory in England in 1856 and around this time he took up photography. Back in Melbourne in 1857 however, Daintree set up as a photographer in partnership with the flamboyant French journalist Antoine Fauchery. The pair produced, in parts, one of the first albums in Australia showing views of Victoria including images of Aboriginal people in 1858. Employed by the Geological Survey Victoria from 1859–1864 Daintree used of photography in geological reporting also having them hand coloured for effect. From the start Daintree's use of a range of processes and strategies and his understanding of the promotional value of photography was inspired. He also supplied images for publication as stereographs and made transparencies.

In 1864, Daintree took up pastoral leases in North Queensland but was appointed northern Queensland Government Geologist in 1867. He was commissioned to prepare photographs and mineral samples for the London International Exhibition of 1870. and he had his photographs enlarged and coloured as more effective displays. He produced a Queensland album in autotype in 1872 as well as folios of views of bush life. In 1872, Daintree became the Queensland Government Agent-General in London where he promoted immigration using his Australian photographs.

Daintree exhibited at the Imperial Exhibition (1872), the Vienna Exhibition (1873), and the Philadelphia Centennial Exhibition (1876). Ill health forced his resignation in 1876 and he died in England in 1878.

GAEL NEWTON

D'ALESSANDRI, FRATELLI (1818–1893)

Studio, Italy

Consisting of Antonio D'Alessandri & Paolo Francesco D'Alessandri (1827–1889) Fratelli D'Alessandri became one of the foremost studios in Europe, known for their elegant approach to portraiture. Father Antonio Alessandri was granted financial and social success overnight when he became the first official photographer, *fotografico pontifico*, to the Pope and the Vatican court with world-wide distribution of Papal imagery. In 1858 he was awarded a 'grand medal of gold of His Holiness Pius IX.' These were troubled times, not least that Rome, led by the Pope, was to continue its decline as the cultural capital of Europe, to be eclipsed by Paris. Pope Pius IX (1792–1878) became pope in 1846 but if he did appear to have liberal leanings, these were all destroyed in the short lived revolution of 1848 when he fled Rome and sought the help of French troops. By July 1849 the rebellion was over. While the rest of the Kingdoms of Italy joined in the idea of the Unification, but not without difficulty, Pius resolutely refused to acknowledge the possibility. Thus Rome filled up with the French, along with many destitute priests who had fled from the other provinces as they were no longer required to be the civil service. It is strange for us today to conceive of a Pope running a country, complete with an army, (largely made up of Catholics from outside Italy together with a foreign army), and a Pontifical

D'Alessandri, Paolo Francesco. Inner view of an Intalian Renaissance Palace.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

state police. In effect it was a priest state, (priests were the only industry) with many public executions by guillotine. D'Alessandri was used therefore to project the image of a *different* society, one of affluence, stability: propagating the establishment's culture, by demonstrating through photography these perceived virtues. When the Bourbons fled from Naples in 1862 their court added itself to Rome's glamorous society, along with Roman aristocracy and the rich and famous who were still on the Grand Tour, *all* became the clients of the photographer-priest, such as: 'Alessandro Torlonia and his daughter,' 1872, (Torlonia was the richest man in Rome in the 19th Century) or that of 'HRH Prince of Wales. the future King of England,' 1859. The Pope continued to demonstrate his control by public displays using his photographer: 'Pope Pius IX blessing the Column of the Immaculate Conception,' 1857, which commemorated his 1854 dogma. In 1864, he set his face against science with his 'Syllabus of Errors' that ruled that scientific theory must always be subservient to church teaching. Just as the photographic topographers, for technical reasons, displayed the cityscape as an empty, barely populated, peaceful sanctuary of aesthetic splendour, of ruin and palace, these organised political photographs, along with the portraiture of Rome's 'nobility,' hid the real world that was taking place in the street. D'Alessandri does not portray the field labourers who lived out their lives, just beyond the boundary of Rome, in grass huts, or demonstrate a Rome of street beggars, rampant malaria, unsanitary conditions, poverty, where the education system, also ran by the church, produced a country with 78% illiteracy. The mask slips, albeit unintentionally, only a few times: D'Alessandri took perhaps the first examples of Italian photojournalism: the Papal troops at Anzio, 1862, and the battlefields of Mentana and Monterotondo in 1867 which were reproduced in the *L'Illustration, Journal Universal* (Paris), no doubt to much French enthusiasm. At Mentana, north east of Rome, Garibaldi's ragged 4,700 red shirts' march on Rome were wiped out by 12,000 French and Papal troops. D'Allesandri depicts the empty battlefield littered with corpses, not with intended sadness but presumably as a warning to the citizens. Just as the photograph of 'Pius IX blessing the troops at *Campi di Annibale*,' 1868, is meant to signify virtue. But in 1870, with the French once more changing sides, the breach in the city walls of the 20th September, marked the end of the Pope's temporal power after 14 centuries of rule. His introduction of the 'Dogma of Infallibility' in the same year, and his declaration that he was now a prisoner in the Vatican, did nothing to stop the Unification. It also marked the end of D'Alessandri's Pontifical contract: '*Padri del Concilio Ecumenico,*' 1870, being one of the last of such photography commissions. But the great and the good continued to be his clients and, presumably in defiance of the Pope, D'Alessandri went on to photograph the new rulers.

It is most unusual for a priest to become interested in photography and very rare, if not unique, for one to run a successful business, even in the Papal States where all businesses had to obtain a Vatican licence. To date, there is no understanding of how his interest came about. As he had no artistic training, this might explain his gravitation to portraiture, as distinct from landscape and architecture, but it does not explain his concentration on producing expensive photographs

for a rich clientele. In that he obtained the *fotografico pontifico* then he would have had full approval for *all* his endeavours by the Vatican who no doubt could see the importance of photography, not least as a means of communicating propaganda to its citizens: what better than to have a trained priest to run it? Since he remained unmarried, one could assume he did not forgo his calling. It is the much more likely therefore that the politics of the Vatican had a role to play in D'Allesandri's business from the very beginning and much control throughout, for it was always strong on censorship of all the arts, including what its citizens were reading and viewing. One incident brought his name momentarily into scandal when a fake (montage) nude photograph of Mario Sofia, the former Queen of Naples, who fled to Rome in 1862, was circulated and 'a priest' was accused. During the investigation, another priest, Filippo Bottoni, was sent to jail when he was found to have a hoard of pornographic photographs which he had been supplying for sale.

Father Antonio D'Alessandri, born L'Aquila, took up an interest in photography while at l'Università Romana in 1852 when he also appears to have made frequent visits to the nearby photographic studio of the Luswergh family (Angelo 1793–1858, father and sons Giacomo 1819–1891 and Thommaso 1823–1907), the first Italian studio to produce a catalogue in 1855 (of 131 entries of views and portraits). With the coming of the prospects of much money to be made on the arrival of the albumen and glass plate negative, post 1851, D'Alessandri joined the many and opened a studio in Rome in 1856 in Via del Babuino 65 (until 1865), then at Via del Corso 10–12, and, after his death, the family business moved to 61–63, with his nephew Tito in charge and where they could boast a terrace where group portraits of up to 200 people could be taken. Antonio worked with his brother, Paolo Francesco, who was an excellent photographer in his own right (and is often overlooked). Eventually Paolo's children, Alessandro (1862–1941), Tito (1864–1942), Cesere (1871–1933), and Mario (1874–1943) also worked in the company with Tito becoming an especially able photographer and main director. Such was the success of the enterprise that Fratelli D'Alessandri, in collaboration with Giacomo Arena, opened in Naples at Via della Pace 7, and had distribution facilities in Paris and Vienna. Antonio became an honoured member of the *Société Française de Photographie* in 1859 and a friend of Nadar. Between 1860–1880, when they were at their most successful, the company employed over 20, including all family members, male and female. Fratelli D'Alessandri exhibited in the major international exhibitions of industry and photography mostly portraits of the great and the good but also with some *Vedute di Roma*: Florence 1861, Rome 1870 (gold medal) with 40 photographs depicting living bishops along with a portrait of the Pope, Paris 1878 (gold medal) with views of Rome, Milan 1881 (bronze medal) with a series of hand coloured portraits for which they had become well known, Turin 1884 exhibited interior shots of the Palazzo del Quirinale, and Rome 1890 (gold medal). Paolo's children all died in 1942/1943 but the firm managed to last until 1950.

ALISTAIR CRAWFORD

See also: War Photography.

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DALLEMAGNE, ADOLPHE JEAN FRANÇOIS MARIN (B. 1811)

Adolphe Jean François Marin Dallemagne was first a painter and then a photographer. Born in 1811, near Paris, he learned how to paint from Ingres (1780–1867), Léon Cogniet (1794–1880) and Raimond Quinsac Monvoisin (1794–1870), all in the neoclassical style. According to Nadar, in his autobiography, "Quand j'étais photographe," he began his practice under the influence of his friend, another painter, Hippolyte Lazerges (1817–1887). Dallemagne's studio was located at 9 avenue de Ségur and in this studio, Dallemagne created his main piece which was the Galerie des artistes contemporains. This consisted of photographs of better known artists of the day like the writer Henri Monnier, the painter Frédéric O'Connel, and of Edouard Manet too.

Dallemagne worked with models as well which were photographed with items making obvious Dallemagne's allusions to certain occupations. These images appeared in different painting frames from the time periods and styles of Louis XIV, Louis XV or Louis XVI's, complete with a theatrical velvet curtain.

During this time, photography copied paintings and often looked for acknowledgment in it. Dallemagne also displayed his photographs during several exhibitions of the Société française de Photographie in the years 1863, 1864, 1865, and 1870. Later, the images appearing in these shows were distributed by Nadar's studio.

The painter kept his photographic studio until 1872, after which little is known including the year in which he passed.

MARION PERCEVAL

DALLMEYER, JOHN HENRY (1830–1883) & THOMAS ROSS (1859–1906)

J. H. Dallmeyer Limited was founded in 1859 at 19 Bloomsbury Street, London.

About 1888 the company moved to 25 Newman Street, London, and from about 1907 kept a sales office at 31 Mortimer Street, London, and a works in Willesden, in north west London.

A naturalised British subject, John Henry Dallmeyer (1830–1883) was born in Loxten, in Westphalia and, having shown a talent for science and mathematics, was apprenticed to an optician. He came to England in 1851 and joined the optical firm of Andrew Ross, subsequently marrying a daughter of his employer. Ross, on his death in 1859, left Dallmeyer a third of his private fortune and a substantial part of the company's machinery and equipment, thus allowing Dallmeyer to set up his own company, supplying initially the astronomical telescopes for which Ross had gained a high reputation and which had been made by Dallmeyer during the six years prior to Ross's death.

As a company, J. H. Dallmeyer produced lenses and other optical and photographic equipment, including lenses for microscopes. Dallmeyer was a skilled and inventive lens designer, fully aware of the latest scientific developments and maintaining close contact with prominent scientists of the day, notably Sir John Herschel. In 1861 he was elected a fellow of the Royal Astronomical Society. From the early 1860s he began to design and manufacture camera lenses, to the same high quality as his telescopes. He gradually relinquished to his employees, whom he had trained, the manufacture of many of the company's products, and devoted his time to improvements in photographic optics and associated equipment. Notable early designs included the Triple Achromatic lens and the Patent Portrait, the latter being a modification of the well-known Petzval formula, and with a further modification that allowed a variable diffusion of focus. This lens was extensively used by portrait photographers during the second half of the nineteenth century.

Dallmeyer also designed lenses at this time that worked at very large relative apertures, including a portrait lens of the Petzval type with a maximum aperture of f/2.2—much used for photographing children, due to the shorter exposures that it allowed—and, for a small camera called the Pistolgraph, a Petzval-type lens of approximately f/1. During the 1860s he also produced lenses designed for astronomical photography. In 1866 the Wide Angle Rectilinear and Rapid Rectilinear were produced. The latter, for which Dallmeyer made use of a special type of glass made by Chance Brothers of Birmingham, was a long-lived design that lasted well into the following century.

A high profile was maintained by advertising and also by exhibiting the company's products. Dallmeyer lenses gained the highest awards in London in 1862, Dublin & Berlin in 1865, Paris in 1867 and 1878, and Philadelphia in 1876. J.H. Dallmeyer also wrote an informative pamphlet 'Photographic Lenses: On Their Choice and Use,' that ran to six editions and was a valuable addition to the company's advertising. It was re-issued in 1892, with much additional material, by T.R. Dallmeyer. The company had a substantial export trade, supported by a reputation for high quality and consistency. Exports to the USA were especially important, the New York company E.& H.T. Anthony acting as Dallmeyer's sole agents. Dallmeyer lenses also found their way to most parts of the British Empire, not least as part of that process of documentation of the empire undertaken by British photographers. In 1878 John Henry Dallmeyer was awarded the Legion of Honour by the French Government. He also received the Russian Order of St. Stanislaus.

From about 1880, as J.H. Dallmeyer's health deteriorated, his son Thomas Ross Dallmeyer (1859–1906) progressively took over management of the business, which he retained until 1892 when the firm became a limited company. T.R. Dallmeyer was, like his father, a prolific and talented lens designer, gaining his B.Sc. at King's College, London. In the 1880s, at a time when other makers were attempting to take advantage of the company's reputation by producing copies of Dallmeyer lenses, he maintained the commercial advantage by continuing to produce new lenses, notably the Rapid Long Focus Landscape Lens in 1884, and the Rectilinear Landscape Lens in 1888.

With the arrival of the new anastigmat lenses from Zeiss of Germany, using the latest types of glass developed at Jena, and with a performance superior to the Rapid Rectilinears, it was imperative that Dallmeyer should produce a comparable lens. The new design was called the Stigmatic, designed by H.L. Aldis and announced by Dallmeyer in 1896. These lenses, with periodic modifications, continued in production into the 1920s.

Dallmeyer was also prominent in the development of the telephoto lens, being, in 1891, the first company to produce a practical lens of this type. T.R.Dallmeyer remained an active lens designer despite delegating much of the work to others. In 1890, at the request of his friend the photographer P.H. Emerson, he designed a lens that was intended to replicate the characteristics of the eye. In 1893 he designed, at the request of J.H. Bergheim, a soft-focus portrait lens, the Dallmeyer-Bergheim, that went into production in 1896.

The company's Lens Books show that Dallmeyer lenses were purchased by many of the most prominent photographers of the mid- and late nineteenth century.

Their publicity also claims Julia Margaret Cameron as among the users of their lenses.

Under J.H. Dallmeyer, the company also began to supply cameras, concerned that their lenses should be fitted to well-made and accurately-registered instruments. A range of studio and field cameras was made available, mainly manufactured by George Hare. Subsequently, folding hand cameras were also supplied.

After 1900 the company continued to design and produce lenses for still and cine use, including projection and enlarging lenses. During both World Wars production was given over to gun-sights and other military equipment. The company was formally dissolved in 1993.

David Stone

See also: Ross, Andrew; Herschel, Sir John Frederick William; Petzval, Josef Maximilian; Emerson, Peter Henry; Cameron, Julia Margaret; and Zeiss, Carl.

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DALLY, FREDERICK (1838–1914)
English architectural photographer

Frederick Dally professional portrait and landscape photographer (born Southwark, England 29 July 1838; died Wolverhampton, England 28 July 1914). Educated at Christ's Hospital, London, Dally arrived in Victoria, Vancouver Island, in 1862 at the height of the Cariboo gold rush and began business as a general merchant. In June of 1866, he opened a photography gallery on Fort Street, where he produced carte-de-visites of prominent citizens, and sold albums and views of public buildings, local scenes, and special events. He documented the buildings of the colonial government in Victoria and New Westminster and of the Royal Navy at Esquimalt. As a keen observer and amateur anthropologist, he produced an extensive record of the native peoples of British Columbia and also collected native artifacts.

Best known are his 1867–68 photographs of the Cariboo Wagon Road and the goldfields. Many of these views were later used to produce engravings for publication.

In response to 1869 circulars Dally supplied photographs of prominent buildings and scenery and of native peoples to the Colonial Office. In September 1870, he sold up and left Victoria to study at the Philadelphia Dental College, returning to England in 1872 where he set up practice as a dental surgeon, briefly in London and subsequently in Wolverhampton. He maintained an interest in British Columbia, and eventually sent his photographs and papers to the Provincial Archives in Victoria just before his death.

Joan M. Schwartz

DAMMANN, CARL VICTOR (1819–1874) AND FRIEDRICH WILHELM (1834–1894)

Carl Victor Dammann was born at Muess, Schwerin, northern Germany; Friedrich Wilhelm Dammann, born at Ludwigslust, is described as his brother although they were half-brothers or possibly cousins. Carl trained initially as an architect. It is not known when he took up photography or who taught him. However by January 1869 he is listed as having a photographic business at Grosse Johannisstrasse 4, Hamburg. He is remembered solely for one work, *Anthropologisch-Ethnologiches Album in Photographien*, a massive project undertaken in the 1870s with the Berliner Gesellschaft für Anthropologie, Ethnologie und Urgeschichte (BGAEU), and with which Friedrich also became involved.

How Dammann came to work in ethnological photography is not known. He appears to have been a portrait photographer, so the production of ethnological 'types' might be seen as a broadly related practice and aesthetic. As a major port, Hamburg offered ample opportunities. In 1870–1 Dammann made a series of photographs of African and Arab seamen from Zanzibar. Taken against a plain background, in full face and profile aspects, they were in the accepted scientific aesthetic. These photographs were followed by a similar series of a group of Japanese acrobats. They received unanimous approval from members of the German anthropological establishment, the BGAEU—Adolf Bastian, Robert Hartmann and Rudolph Virchow. Recommended in *Zeitschrift für Ethnologie,* they formed the basis of the collaboration between Dammann and the BGAEU from which the *Album* emerged.

Anthropologisch-Ethnologiches Album in Photographien was published through 1873 and 1874 in ten sections of five folios each, containing 642 photographs in all. Edited by Dammann and published by Wiegandt, Hemel und Parey (Berlin), conceptually it is not dissimilar from Etienne Serres' call in 1845 for a photographic 'museum' of the races of mankind for scientific purposes. Between 6 and 18 tipped-in albumen prints are grouped geographically and culturally, and arranged in a grid within a printed boarder on the folios measuring 48 x 64 cm. Ethnic group is given in a letterpress caption beneath each photograph and each folio carries a short ethnological caption and, in most cases, an acknowledgement of the donor of Berlin's photographs. It was an expensive production, aimed at learned and scientific societies and

universities. The first folios were awarded a silver medal at the 1873 Vienna World Exhibition.

The project gathered photographs from all over the world. The BGAEU appealed to the German expatriate community with anthropological interests to collect and submit photographs. These were sent to Berlin, and forwarded to Dammann by the BGAEU. Sources varied widely. Some donors were scientists, such as Gustav Fritsch whose photographs of south African groups comprise some nine folios of the *Album.* Some appear to have been submitted by the photographers themselves. Others were from the existing collections in Berlin or from the Museum Godeffroy in Hamburg. The majority were sent in by German traders and colonial officers, including many images from commercial photographers, the stock-in-trade of the 'ethnic' carte de visite market available locally. This resulted in a wide range of photographic styles, from the anthropometric to the naturalistic and 'domestic,' being absorbed into precisely scientific meanings. While the *Album* presents a racial classification and reflects German anthropological thinking of the period, it lacks taxonomic precision —a serendipitous element being determined by its simultaneous collection and publication.

Although some of the photographs were made from original negatives, many were from copy negatives made of prints submitted for the project. There is a clear qualitative difference. The method can be seen in surviving whole plate negatives made by Friedrich in 1874–6. Prints were laid out on newspaper and copy negatives made. These were printed and then trimmed, mostly to standard carte de visite or cabinet sizes. While donor- photographers or scientists presumably gave their permission, overall the *Album* demonstrated the level of unauthorised copying and lack of global copyright protection for photographers at this period, which, in part, made it possible. Some copy prints survive on Dammann's studio card; printed, in red, in typical style of the period.

Friedrich Dammann, who lived in England, only appears to have got involved with the project after the death of Carl in April 1874 He liaised with the BGAEU and undertook some of the production. However as the last folios appeared by September 1874, it is not clear how much input he had to the *Alum* itself. Like Carl, it is not known how and where he learned photography but he appears to have been a competent operator.

While the heart of the project were the great German folios, there were other very different editions. An English popular edition, *The Races of Man: Ethnological Photographic Gallery of the Various Races,* was published in London 1875 by Trübner. It comprised 24 plates, measuring 24 × 32 cm, and contained 167 photographs. There is a clearer evolutionary narrative starting with 'Civilised' Europeans and ending with Australians, Melanesians and Micronesians. Although Carl's name appears on the title page, it was produced by Friedrich and includes material not in the *Album,* added to the project after 1874. Friedrich was also responsible for a 'schools' edition' *Anthropologisches Schul-Album in Photographien* (n.d. 1875/6?). Although the same format as *The Races of Man*, the 179 photographs used and its intellectual shape had more in common with the *Album*. It also includes material not published in the *Album*. Friedrich must also have been responsible for the realization of the 1876 *Ethnologischer Atlas sämmtlicher Menschen-Racen in photographien* although it was published under Carl's name by Meissner of Hamburg.

Overall the dissemination outside Germany was not extensive. Several copies of the *Album* and the other editions survive. While some of the material was returned to Berlin in the 1880s, and is in the collections of the BGAEU and the Museum für Völkerkunde, the residue of carte de visite prints and copy negatives made in the latter stages of the project by Friedrich, were bought from his executors in 1901 by Pitt Rivers Museum, University of Oxford. The project remains the most remarkable collaborative anthropological and photographic endeavour of the nineteenth century.

ELIZABETH EDWARDS

See also: Albumen Print; and Ethnography.

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DANCER, JOHN BENJAMIN (1812–1887)

English innovator and inventor of microphotography

Like many of his contemporaries in the early Victorian period John Benjamin Dancer used his enquiring mind over a broad spectrum of scientific endeavours to make inventions and develop innovations that have since become fundamental to our lives. While the invention of photography was clearly the province of Nicephore Niepce, Louis Jacques Mande Daguerre and William Henry Fox Talbot, Dancer falls into the second wave of innovators who developed the process on further, frequently with the minimum of information.

Dancer made known the results of his work through papers to the Manchester Literary and Philosophical Society and the various Manchester and Liverpool photographic societies. The professional and personal relationships he subsequently expanded on provides the key to the rapid development and understanding of the photographic processes in the Manchester area. Dancer's observations were regularly recorded in both the *Memoirs and Proceedings of the Manchester Literary and Philosophical Society* and in the *Liverpool and Manchester Photographic Journal* (later to become the *British Journal of Photography*). There is also a direct connection with the Edinburgh circle through constant correspondence and argument between Dancer and Sir David Brewster on the subject of stereoscopy. Similarly, Dancer was in correspondence with Frederick Scott Archer, who had himself spent his early life in Manchester.

In the year prior to his death he attempted to define his contribution to photography in a letter under the title "Early Photography in Liverpool and Manchester" published in the *British Journal of Photography* on 11 June 1886.

> "Having many reasons for believing that I was one of the first to practice the Daguerreotype process in this country, and also to introduce camera photography into Liverpool and Manchester.... Unfortunately for my purpose, the early descriptions of Daguerre's method of proceeding were crude and obscure. In consequence of this I had six weeks of hard work, numerous failures, and accidentally was nearly suffocated by the vapour of iodine, before I obtained satisfactory results. Being a practical optician, the camera used was one of my own construction, such as I had frequently supplied to artists for tracing the outline of views in the camera. An achromatic object-glass from a telescope gave fair definition. My photographs were objects of great curiosity to scientific friends and acquaintances.... At the request of friends I publicly exhibited the Daguerreotype process to an audience of 1500 people. The object then photographed was a flea, magnified as large as a 7 x 5 (inch) silvered plate would permit, the instrument being a gas microscope of my own construction. Many other microscope objects were enlarged, and some were reduced. One, a printed placard, was reduced to an eighth of an inch square, being perfectly legible under the microscope."

The daguerreotype was not Dancer's first excursion in photography. He observed that the "accounts given of the beautiful pictures (daguerreotypes).... induced me to abandon the photographic paper process." We can assume from this that from 1839, or even earlier, Dancer had experimented with Talbot's process. As with other individuals of this period Dancer would have been more impressed by the definition of the daguerreotype rather than the opportunity to make multiple prints offered by Talbot's photogenic drawings. The links between Talbot and Dancer's father are strong, with their mutual interest in Arabic, Hebrew and cuneiform scripts. At the time of Dancer's father's death in 1835, a connection between Talbot and Dancer would have been established.

When in 1841 Dancer came to live in Manchester he realised that the daguerreotype process had not been practised in the city. He then sold daguerreotype apparatus and taught the process to John Dale, a chemist, and Joseph Sidebotham, a calico printer and dyer. From that time many Mancunians became amateur photographers and "it soon became a popular amusement." In November the same year, Richard Beard opened a Daguerreotype Portrait Gallery in rooms over the Manchester Exchange.

Dancer's greatest claim to fame is his invention of microphotography. Dancer referred to his productions as microscopic photographs; the term microphotography was introduced following a public disagreement in the pages of the *Liverpool and Manchester Photographic Journal* over Dancer's priority of the microphotograph between Joseph Sidebotham supporting Dancer and the Editor of the *Journal*, George Shadbolt. In 1839, only a few months after the introduction of the process, Dancer produced greatly reduced images on a Daguerreotype plate but these could only be usefully viewed at 20 diameters magnification. The image structure was too coarse and the reflectivity of the image may also have been too low for convenient examination at higher magnifications. Dancer's earliest successful results date from February 1852, although there may be an argument for an earlier date, and were based on Scott Archer's wet collodion process. This adequately fulfilled Dancer's requirements and he soon produced minute images containing groups of portraits in a circle of 1/16 inch diameter. Dancer produced microphotographs commercially and sold the images mounted on a 3 inch × 1 inch microscope slide. Sir David Brewster exhibited Dancer's microphotographs to the Academie des Sciences, Paris in 1857 and later in Paris and Rome. In Rome, Dancer's microphotographs were shown to the Pope. Dancer also succeeded in producing graticule images by photographic means.

In 1852 Dancer invented a binocular stereoscopic camera. The idea had also been brought forward by Brewster in 1847. An instrument was actually made in 1849, the only known model of Dancer's camera, but was destroyed in 1940. An improved version, an instantaneous camera patented on 5 September 1856 (Patent No 2064), is better known. Its features included magazine loading, a spirit level and a double rotating shutter.

Dancer's inventions and innovations were not limited to photography. He was a passionate and talented inventor in many fields. He discovered the basis of electrotyping by depositing copper electrolytically on an engraved copper plate. In 1838 he introduced the porous pot for the Daniel cell, and these pots were later used

in Leclanche cells. He crimped the plate of the Daniel cell to double its own area, and he produced ozone in 1838 but failed to recognise its significance. Also that year he invented the subdivision of secondary windings of an induction coil to produce choice output voltages, and he devised the magnetic circuit breaker. Among his other inventions is a shellac-coated card that could be used in place of glass in electrophorous and leyden jars. He invented a six-way tap to control the supply of gasses to dissolving lanterns, and introduced achromatic projection lenses to magic lanterns. He supplied James Robertson with lanterns and gas equipment, and the Manchester Mechanics Institute with a dissolving limelight lantern.

He was the first person to supply achromatic microscopes for Boston, Optician of Liverpool, and he also made one for John Dalton. He introduced the Davies Shutter and constructed a binocular microscope for the Field Naturalist Society. Dancer is also known to have designed special lenses for his microscopes, and may have done so for camera lenses as well. He made improvements to telescope mountings, rain gauges, speed indicators, surveyor's levels and air pumps. He invented an apparatus for Sir Joseph Whitworth for checking the accuracy of rifle barrels. He developed an accurate thermometer for James Joule in 1843, and made apparatus for Joule's determination of the mechanical equivalent by heat. He invented a fairy fountain; a multi-jet fountain illuminated from below with coloured lights and controlled by an electric keyboard.

Dancer's most active years in terms of invention and innovation appear in the twenty years from 1837 to 1857. After this period his activities were devoted mostly to manufacture and refinement of earlier work. While he was well known and respected by his peers it is since his death in 1887 that he has disappeared into relative obscurity. In 1960 his great granddaughter received from the National Microfilm Association of America a posthumous Medal of Meritorious Service to the microfilm industry. Not only was John Benjamin Dancer the inventor of microphotography, in a very real sense he was the father of photography in the Greater Manchester area.

MICHAEL HALLETT

Biography

John Benjamin Dancer was born on 8 October 1812 in London, and died on 24 November 1887 in Manchester. He is buried in Brooklands Cemetery, Sale. His father Josiah Dancer was born in 1779, and had in turn worked under his father, Michael, who was a joiner. Josiah Dancer became an optician from 1817 and then moved to Liverpool where he died in 1835. Dancer joined the Manchester Literary and Philosophical Society in 1842, being sponsored by John Dalton and was made an Honorary Member in 1884. He was elected a Fellow of the Royal Astronomical Society in 1855 and appointed optician in Manchester to HRH the Prince of Wales in 1869. While, on occasions, he took photographs, Dancer never operated as a professional photographer. By trade he was a scientific and optical instrument maker taking over his father's business in Liverpool in 1835 and moving to Manchester in 1841 to set up a similar business under the name of Abraham and Dancer. For the majority of his life in Manchester Dancer was in business on his own account at 43 Cross Street. In 1870 John Benjamin Dancer contracted diabetes, and his sight began to fail. After three operations for glaucoma, he gave up his business in 1878. The business transferred from Cross Street to Ardwick under his daughters, Eleanor Elizabeth and Catherine, and became E.E. Dancer & Company. On the 11th August 1896 it was sold to Richard Suter for £50.

See also: Niépce, Joseph Nicéphore; Daguerre, Louis-Jacques-Mandé; Talbot, William Henry Fox; Daguerreotype; Sidebotham, Joseph; Beard, Richard; Archer, Frederick Scott; Wet Collodion Negative; Wet Collodion Positive Processes; Brewster, Sir David; and Robertson, James.

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DANDOY, ARMAND (1834–1898)
Belgian photographer and painter

Armand Dandoy, christened Ernest, was born in the small town of Gougnies, in Hainaut province, Belgium, on 11 November 1834, second son of Joseph Dandoy (1801–1850), manager of a smelting plant, and his wife Jeanne née Janne (1801–1871). In 1838, the Dandoy family moved back to their native town of Namur, where

Joseph became director of the municipal gasworks. Presumably educated locally at Jesuit college, Armand Dandoy showed early artistic inclinations, and he attended the *Atelier Saint-Luc*, an academy which spearheaded the Realist movement in Brussels. Here he joined his childhood friend, Félicien Rops (1833–1898), whose precocious talents were already marking him out as a artist and engraver of promise. Their friendship would be lifelong, attested by an extensive correspondence and underpinned by a shared passion for rowing, especially on the river Meuse which flows through Namur province.

Armand Dandoy opened his first photography studio in partnership with his elder brother Héliodore (1831–1909) at Rue de Gravière 14, Namur, on 1 July 1856 under the denomination *Dandoy frères* [Dandoy brothers]. Armand alone exhibited portraiture and "instantaneous" studies of horses at the Brussels photography exhibition of 1856, and again at the Société française de Photographie in 1857. The studio transferred to Rue de Fer 82 in about 1858, from which address the Dandoy brothers issued a set of stereo views *Bords de la Meuse* [Banks of the Meuse]. Héliodore opened a branch studio in Spa, Place Royale 454, in May 1861, which traded as *Dandoy frères* until its closure in April 1866, and for which Rops produced an advertising poster in lithography. From 1862, Armand continued running the Namur studio under his own name.

Jeanne Dandoy acquired a plot of land in 1865 on the site of recently dismantled fortifications, on which she had a customised portrait studio constructed. Title of the premises at Rue de la Station 6, renamed Rue Mathieu, was transferred to her son Armand, who opened the studio on 10 September 1866. He operated it continuously until his death thirty-two years later, secure in his reputation as portrait photographer of choice to the regional bourgeoisie.

Armand Dandoy married Charlotte De Coster (1831–1912), known as Caroline, on 24 October 1867. She was the sister of Charles De Coster (1827–1879), prominent man of letters and member of the same loose-knit group of Namur artists as Dandoy and Rops. Dandoy immortalised the "colony" in a group portrait, taken on a river excursion at Anseremme, in the Meuse valley, in 1875, in one variant of which the photographer himself appears to one side.

Affable and clubbable, Armand Dandoy served on the municipal fine-arts committee and the *commission des fêtes* [festival committee]. A long-standing member of the *Cercle artistique et littéraire*, he exhibited landscapes at the club's triennial salons from 1868 to the year of his death. A painting companion of Rops,' Dandoy's artistic reputation was high enough for him to be a serious though ultimately unsuccessful candidate for the post of professor of painting at the local Academy on two occasions in the 1880s.

What raises Armand Dandoy above all this provincial worthiness and places him in the forefront of early Belgian photographers is the inventory of the historic landscapes, monuments and cultural artefacts in the Namur province which he realised over a ten year period. In the tradition of the "missions" undertaken by Guillaume Claine and Edmond Fierlants in previous decades to record Belgium's architectural and artistic heritage, the idea ironically was the brain-child of another prominent photographer. Joseph Maes addressed a letter to the governor of Namur province on 1 May 1868, setting out his proposal for such a photographic campaign, citing the advantages for promoting tourism in the region and underlining the need for a visual inventory of monuments, many of which were under threat from redevelopment or the ravages of time. Dandoy made a counter-offer in a letter transmitted and overtly supported by the interior minister. After much debate by the provincial council, and sustained lobbying by Dandoy, which included undercutting Maes' estimate by a half, the authorities decided in Dandoy's favour. The *Comité provincial des Monuments* drew up an initial list of seventy-one views in October 1868, and the following July Dandoy agreed to take 100 full-plate negatives and deliver three prints of each, in fascicles of ten prints, at a price of 200 francs per fascicle.

The first part of *La Province de Namur Monumentale & Pittoresque* [The Province of Namur Monumental and Picturesque] was completed in October 1869 but the project would extend through the next decade, due as much to the photographer's lackadaisical character, as to his perfectionist approach in matters of view-taking and print-making. View-taking required many field campaigns with a photographic wagon (visible in some of the images) into idyllic but inaccessible countryside, while the resulting richly toned albumen prints were mounted on heavy litho-tinted bristol board, individually captioned and carrying the statement "Publié par l'Auteur sous le Patronage de la Province et de l'Etat" [Published by the Author with the Patronage of the Province and the State]. Dandoy did not adhere strictly to the list of monuments which the provincial committee had proposed, but in the end produced 140 plates. Of these 110 are recorded as having been issued, in eleven fascicles of ten plates, supplied to the authorities and commercialised in parallel by the photographer in partnership with the Brussels lithographers Simonau and Toovey. The first ten were issued between 1872 and 1875, and a final part appeared in 1879. Selections were exhibited widely and to critical acclaim in Belgium and internationally, firstly at the international exhibition in London in 1871 and most notably at the universal exhibition in Paris in 1878, where Dandoy was awarded a bronze medal.

Dandoy's most accomplished achievement technically

was his documentation of the subterranean caverns at Han-sur-Lesse, a two week campaign in November 1876, resulting in thirty views obtained with a system of twenty-two portable magnesium lamps. His final innovation was the publication of postcards in collotype in 1895 for *Namur-Attractions*, a tourist promotion agency.

Armand Dandoy died on 14 July 1898. The portrait studio continued operating under his widow's name until 1902, thereafter under the authority of Edmond Rosbach (born 18 April 1865), Dandoy's operator since about 1892. Dandoy's widow bequeathed him the contents of the studio, with the exception of negatives from the series *La Province de Namur Monumentale & Pittoresque*, which she left to the *Société archéologique de Namur*.

There are substantial holdings of Dandoy's work at the Archives du Palais du Roi, Brussels, Bibliothèque royale Albert Ier—Cabinet des estampes, the Bibliothèque universitaire Moretus Plantin, Namur and the Société archéologique, Namur. The glass plate negatives in the latter institution were copy printed in 1995, and transferred to disquettes accessible to the public at the Division du Patrimoine, Ministère de la Région wallonne, Namur.

STEVEN F. JOSEPH

Biography

Armand Dandoy, christened Ernest, was born in Gougnies, Hainaut province, Belgium, on 11 November 1834, second son of Joseph Dandoy (1801–1850), manager of a smelting plant, and his wife Jeanne née Janne (1801–1871). He opened his first photography studio in partnership with his elder brother Héliodore (1831–1909) at Rue de Gravière 14, Namur, on 1 July 1856. A customised portrait studio was constructed at Rue de la Station 6, renamed Rue Mathieu, and opened on 10 September 1866. Dandoy operated it continuously until his death. He married Charlotte De Coster (1831–1912), known as Caroline, on 24 October 1867. He was secure in his reputation as portrait photographer of choice to the regional bourgeoisie,

Armand Dandoy's major achievement is the landscape series *La Province de Namur Monumentale & Pittoresque*, comprising 110 prints issued between 1869 and 1879. Armand Dandoy died on 14 July 1898.

See also: Société française de photographie; Landscape; Architecture; and Collotype.

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DARKROOM AND DEVELOPING CHAMBER

In the course of the second half of the nineteenth century, the darkroom evolved from being a simple 'darkened room' for the preparation and development of photographic materials, to become the photographic developing and printing room with which analogue photographers today would be familiar.

In the 1840s, the period in which the daguerreotype and calotype were in ascendancy, their low sensitivity to light permitted much of the preparation work to be carried out in candlelight. By the end of the century, conditions required for the processing of the high speed panchromatic materials of the day required the exclusion of all light.

At the height of the daguerreian era, Henry Morley, Editor of Charles Dickens' popular periodical *Household Words* painted an eloquent picture of the work rooms behind John Jabez Edwin Mayall's London studio in an essay for the magazine in March 1853:

> The den of the photographer, in which he goes through those mysterious operations which are not submitted to the observation of the sitter, is a small room lighted by a window, and communicating into a dark closet, veiled with heavy curtains.... There, having carefully excluded daylight, the operator lifted up the lid of a small bin, rapidly fixed the plate, silver side downwards, in a place made underneath for its reception....

The term 'dark chamber' or 'dark-room' originated in the earliest years of the daguerreotype, when it was assumed that all the stages of sensitisation had to be performed in the dark. That idea was dismissed by Antoine Claudet in his 1841 British Patent No. 9193 of 1841, in which he patented the idea of

> 'performing all the operations upon the plates which were formerly carried on in the dark now in a room lighted through the media of various colours, such as red, orange, green and yellow, but red I prefer, which, having very little effect upon the plates covered with the sensitive coating, allows the operator to see how to perform the work without being obliged as before to remain in a dark room.

In his 1841 patent for the calotype, British Patent No. 8842 'Photographic Pictures,' however, William Henry Fox Talbot made no mention of a dark room or dark chamber. For the first stage in the making of a calotype, he refers only to the fact that 'all this process is best done in the evening by candlelight' and suggests drying the paper, once brushed with silver nitrate, 'cautiously at a distant fire.'

Talbot, like many other travelling photographers who came after him throughout the 1840s, 1850s and 1860s, thought nothing of converting hotel bedrooms into makeshift darkrooms for the preparation and later development of their materials. Indeed, innkeepers in the 1850s were known to keep towels and bed-linen, already stained with silver nitrate, for when photographers came to stay.

Studio-based photographers had their darkrooms adjacent to the studio itself—essential in the days of wet collodion as the plate had to be coated and exposed while still damp. Travelling photographers in the wet plate era had to take their darkrooms with them on location, and as the sensitivity of materials improved, the requirements for an effective darkroom—either fixed or transportable—became more stringent.

Writing in *The Silver Sunbeam* in 1864, at the height of the wet collodion era, Professor John Towler MD offered his readers advice on the construction of their darkroom and developing chambers

> The Dark-Chamber and the ordinary work-room may be constructed on the northern side of the glass-house, the window of one being glazed with an orange-yellow glass, in order to absorb the actinic rays, and the other with common crown-glass. On the outside of the side windows, small platforms are formed for the reception of the printing frames

(The making of prints, at the time, was in contact with the negatives and exposed to daylight.)

> The chamber intended for all operations of sensitizing, commonly called the Dark-Room, ought to lie contiguous to and open into the common operating or work-room of the photographer; and both these rooms ought to open directly into the glass-house…a single pane of orange-yellow colored glass is all that is needed.…This mode of admitting light permits the progress of the development to be distinctly watched much more effectively than by reflected light.

Four years later, William Lake Price, in his *Manual of Photographic Manipulation* introduced the idea that a well designed and well-maintained darkroom made for greater productivity as well as ensuring the health of the operator.

> Small and inconvenient dens may be made to do duty on occasions, but if it be possible to obtain a certain space, say sixteen feet by twelve, for this purpose, it will be well bestowed, both in the increased convenience for the production of the negatives, and for the health of the operator, by the superior ventilation it affords…
>
> … Let the darkroom contain only those things which legitimately belong to it; let the shelves &c. be washed frequently and kept free from dust, the sinks in the cleanest condition, and the floor covered with oil-cloth, as being the material with the most unbroken surface and most easily purified from dirt.

As early as 1864, the suggestion that darkrooms be fitted with safe-lighting had been postulated—gas lighting held within yellow glass tubes suspended above the developing sink.

For his 1854 journey through Yorkshire, and his pioneering expedition the following year to the Crimean War, Roger Fenton converted a Canterbury wine-merchant's van for use as a mobile darkroom, fitting yellow glass panels in the side, while others used tents of yellow canvas for the same purpose. Portable dark-tents which could be carried as back packs were popular throughout the 1850s, 1860s and 1870s, vying for popularity against designs built around wheelbarrows and other small wheeled vehicles.

With the advent of the dry plate, and the commercial availability of mass-produced materials, the darkroom lost one of its functions, but gained another—becoming the printing chamber as well as the processing room. Enlargers, powered by variety of light sources brought printing indoors and relegated the large plate and the daylight-exposed contact printing frame to the history books for all but a few photographers.

John Hannavy

See also: Mayall, John Jabez Edwin; Daguerreotype; Talbot, William Henry Fox; Wet Collodion Negative; Wet Collodion Positive Processes; Price, William Lake; and Fenton, Roger.

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DARLOT, ALPHONSE (1828–1895)

French inventor and merchant

Born on 3 September 1828 in Seignelay, France, Darlot served his apprenticeship at the Paris optician's of Noël Lerebours and Secrétan where he obtained his Mastership aged 21 years.

Darlot joined the firm of Jean Theodor Jamin which had been established in 1822 in 1855. On Jamin's retirement in 1860 he took over control of the business. From 1860–1861 the firm's lenses carried both names. Darlot lenses were widely imported into the United States and sold by Benjamin French & Co. M. Carey Lea, the American photographic writer wrote: 'Jamin's (now Darlot's) view lenses are very good, and of extraordinary cheapness. The amateur of small means who wishes to take views cannot do better than begin with one or two of them.'

Darlot's most distinctive lens design was the Cône Centraliser lens made by Jamin and Darlot from 1855. It had a flared back section designed to prevent internal reflections. Darlot's other distinctive design were lenses with three swing-out stops. The firm made an extensive range of lenses with most of the Petzval type, landscape lenses and Rectilinears sold under the Hemisphérique or Hemispherical names and they were widely fitted to cameras in Britain and the United States.

Darlot was also active selling cameras and other optical equipment. The firm was awarded a silver medal at the 1867 Paris International Exhibition.

On his death on 5 October 1895 the factory was acquired by L. Turillon who continued manufacturing lenses under the Darlot name.

Michael Pritchard

DARWIN, CHARLES ROBERT (1809–1882)

Charles Darwin was not a photographer himself, but his publications had a lasting effect on how photographs are used in scientific research. Darwin used photographs in preparing at least four of his books: *The Variation of Animals and Plants under Domestication* (1868), *The Descent of Man and Selection in Relation to Sex* (1871), *The Expression of the Emotions in Man and Animals* (1872), and *The Formation of Vegetable Mould through the Action of Worms* (1883). In *Variation,* Darwin published a wood engraving made from an anonymous photograph of a domesticated Yorkshire pig; in the second edition of *Descent,* he published another wood engraving after a photograph of an orang-utan foetus supplied by the German zoologist Hinrich Nitsche (1845–1902). Darwin's last book, *Vegetable Mould,* contained several engravings after photographs of earthworm castings, probably provided by George King (1840–1909), Superintendent of the Calcutta Botanical Gardens. However, it was with *Expression* that Darwin made his most significant contribution to photographic illustration. In addition to wood engravings copied from photographs, *Expression* was illustrated with seven heliotype plates, each containing numerous separate figures. The inclusion of 'real' photographs in a popular scientific book was unprecedented.

Expression is the third in a trilogy of works that lay out Darwin's theories of evolution. The first was the legendary *On the Origin of Species (1859),* followed some twelve years later by *Descent* and the following year by *Expression.* The subject of *Expression* is the evolutionary origins of human emotional expressions. Darwin argued that human expressions can be traced to animal ancestors; for example, that sneering expresses displeasure because it is a vestige of biting to attack in our evolutionary progenitors. This was considered radical, as it is was a purely mechanical interpretation of human behaviour, affording no role to the soul or other spiritual factors. *Expression* influenced generations of physiologists, some of whom used photography themselves, notably including Jean Martin Charcot (1825–93) and Sigmund Freud (1856–1939).

Because many expressions occur faster than the naked eye can comprehend, Darwin struggled to understand which muscle groups are involved in certain expressions. He supposed photography could help by freezing and recording transient expressions for analysis. Technologically, this idea was ahead of its time as instantaneous photography had not advanced to the point at which rapid action could be depicted. Nevertheless, Darwin tried to obtain photographs depicting common human expressions. Beginning around 1869, he began to shop for appropriate photographs in London print sellers and photographic studios. At least forty-one such pictures are held in the Darwin Archive at the University of Cambridge Library. They include examples by The London Stereoscopic Company, Giacomo Brogi, and James Landy among others. He also obtained photographs from friends and acquaintances, principally in Europe. Among these was a group depicting crying infants by the German painter and photographer Adolph Diedrich Kindermann (1823–92), two of which were published in *Expression.*

During this time Darwin encountered Guillaume-Benjamin Duchenne de Boulogne's influential atlas *Mécanisme de la Physiologie Humaine.* Darwin owned two copies of the book, illustrated with photographs by Adrien Tournachon. Darwin corresponded with Duchenne and, with his permission, reproduced eight of his photographs in *Expression.* Darwin also corresponded with the psychologist James Crichton Browne (1840–1938), who had begun using photography to study patients in his care at the West Riding Lunatic Asylum.

Working under the influence of Hugh Welch Diamond, Browne believed photographic imagery could help diagnose and document various psychological disorders. He shared many of his photographs with Darwin.

Ultimately disappointed with existing imagery, Darwin commissioned custom-made photographs depicting certain expressions. He seems to have begun by approaching George Charles Wallich (1815–99), an oceanographer who opened a photographic studio in South Kensington in the late 1860s, but only one of Wallich's photographs was good enough to include in the book.

In 1871 Darwin met Swedish émigré Oscar Rejlander, who became the main photographer on the project. Rejlander is best known for his artistically experimental photographs made by composite printing two or more negatives in a single print, and his propensity for altering and manipulating photographic imagery is well documented. However, he was also an adept portraitist, and at the time of his commission had developed a niche industry making expressive portraits for painters to use as studies. It was this latter ability that commended him to Darwin, although Rejlander did include composites in the imagery he supplied. Rejlander began by looking for suitable images in his studio inventory. Several of these made their way into *Expression.* However, the vast majority of pictures he provided were made from 1871 to 1872 to illustrate specific behaviours requested by Darwin.

Among these was a photograph of a crying child, published as Plate 1, Fig. 1 of the book. It was a huge popular success, prompting Rejlander to sell independent carte-de-visite and cabinet card versions. It became known as *Ginx's Baby* after the title of a popular novel about an orphaned boy by Edward Jenkins. Six of the photographs in *Expression* feature Rejlander himself, posing in a distinctive velvet smoking jacket and enacting the expressions of surprise, indignation, and shrugging the shoulders. Rejlander's wife Mary probably assisted in their production, and she also appears as the subject of a photograph depicting sneering. In total Rejlander supplied at least nineteen of the thirty photographs published in *Expression.* Rejlander also supplied dozens of photographs which Darwin chose not to use; many of these are preserved in the Darwin Archive at Cambridge.

Darwin is the subject of numerous photographic portraits, including several by Rejlander. Portraits by Ernest Edwards (1837–1903) and Julia Margaret Cameron (1815–79) are also well known. Darwin lodged at Cameron's guesthouse on the Isle of Wight in 1868. After *Expression* was published, Lewis Carroll (1832–98) wrote to Darwin offering his photographic services, but Darwin declined.

PHILLIP PRODGER

See also: Instantaneous Photography; London Stereoscopic Company; Brogi, Giacomo, Carlo and Alfredo; Duchenne, Guillaume-Benjamin-Amant; Tournachon, Adrien; Diamond, Hugh Welch; Rejlander, Oscar Gustav; Cameron, Julia Margaret; and Dodgson, Charles Lutwidge.

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DAUTHENDEY, KARL (1819–1896)

German professional photographer

Dauthendey was a German national, born in a family of lawyers. In 1839, he studied at Tauberg Optical Institute in Lindenau, Germany. In 1840 he acquired daguerreotype equipment and opened a studio. Dauthendey's first show of daguerreotype portraits was in May 1842 in Leipzig. However his attempt to become established in any of the German cities failed. In 1843 he created successful portraits of the duke and duchess of Dassau and received from the duke a letter of recommendation to the Russian Imperial Court. In 1843 Dauthendey arrived from Magdeburg to St. Petersburg where he opened a studio in 1844. His studio specialized in taking portraits and reproducing photography. Dauthendey made attempts to show natural colours on daguerreotypes by using different methods to paint them. Knowing neither Russian language, nor local traditions, and having no friends in Russia Dauthendey very soon felt the lack of funds. In 1844 to distinguish himself among the professional photographers of St. Petersburg he made the first experiments using Talbot's method. He went to Leipzig in February 1847 to improve this method. When he arrived back in St. Petersburg he began to create portraits on paper by using Talbot's method which helped him improve his finances and even become one

of the well-known professional photographers of St. Petersburg. In 1862 he left Russia. In 1864 he opened a photographic studio in Wurzburg which remained until his death in 1896.

ALEXEI LOGINOV

DAVANNE, LOUIS-ALPHONSE (1824–1912)

French chemist, photographer, and innovator

Davanne was born in Paris, France on 12 April 1824. Davanne was a chemist and an important innovator in photographic processes. From 1852 onward, he spent much of the following 50 years experimenting with methods that led to more permanent photographic printing. In collaboration with Barreswill, Lerebours and Lemercier, he worked to make a photolithographic process perform better using bitumen of Judea. He also invented several new types of cameras and photographic equipment. In 1856 he was a founding member of the Société française de photographie (S.F.P.). Davanne served on its board and as vice-president, chairman, and honorary president. He took photographs of Versailles and presented to the Institute a portfolio of lithographs from negatives by Le Secq, based on photographs of Versailles.

The calotype was a difficult artistic process, often affected by chance whose effects could be unintentionally and easily modified during printing, and was not a big commercial success. The technique spread however thanks to personal contacts and exchanges between practitioners, and this process's advancement was facilitated in the 1850s by photographic exhibitions. The creation in Paris in 1851 of the Société héliographique, the first gathering of amateur photographers (mostly calotypist), was a particular response to this need of sharing information about this uncertain technique. This meeting allowed a space for sharing methods and tips, and a forum through which photographer could discuss recent improvements. A little group was also formed in the neighborhood of Chalon-sur-Saône, in Burgundy, where Nicéphore Niépce had been located, consisting of Petiot-Grofier, the mayor of the town (who accompanied his master Baldus at the Auvergne in 1854), and Eduard Loydreau, archeologist and mayor of Chagny. Another group was formed at the Sèvres works around Victor Regnault, consisting of a physician who had become director of the company in 1852, and included among others Louis Robert, head of the painting workshop, E. Béranger, and J. Diéterle. An additional third group developed at the 'Caffé Greco' in Rome, appearing around 1850, which included G. Caneva, Count Flachéron, Eugène Constant, and Alfred Normand, to whom one might also add Alphonse Davanne and Thomas Sutton, who participated briefly.

The technical industrialization of photography during the 1860s meant that around 1875 albumen prints had become the standard to be superseded in turn in the 1890s by gelatin-bromide prints. As from 1855, many people like Baldus, Fenton, Le Secq and Davanne tried to overcome the problem of the non-permanence of photographic prints by using the photogravure process.

From 1854 to 1863 he worked with Aimé Girard (1830–1898) on a study of the means of formation and constitution of positive photographic images. In 1857 he had an exhibition together with Aimé Girard.

He received the gold medal within the framework of the Prix du Duc de Luynes in 1859 for this collaborative work. Together they researched the permanence of photographic positives and later published their results in 1864. In 1855 however, Davanne created a rotating bellows camera, which was later constructed by Relandin. Additionally Davanne invented a portable field camera, 18 × 23 cm format, which was constructed by Koch in Paris.

In the 1860s, photographers recorded the localities, their infrastructure, and the indigenous people living there. Alphonse Davanne did this as well and published a series of photographs of Tréport, Dieppe, Trouville, and Le Havre in addition to the large number of individual stereoscopic views in circulation.

In 1861 his images of the Pyrenees and of Menton were shown in an exhibition and in 1862 he illustrated "'l'Hiver à Menton" by Alphonse de Longperier-Grimoard.

From 1863 onward however, his photography became more concerned with the theory of physical development, the Taupenot process, the cause of changes in positive prints, alcline developing and experiments with Chardon emulsion.

In 1863–1864, in yet another exhibition, Davanne showed his view of Normandy. In 1864 he received the Prix de Duc de Luynes. In 1865–1870 he wrote parts of the Photographic Yearbook to be published by Gauthier-Villars. From 1866 until 1876 he was vice-president of Société française de photographie. In 1867 he invented a focimeter, which was constructed by Secretan and by this time, he had become a member of the Duc de Luynes award committee.

The kings of France took an early interest in the building and unkeep of roads and public works, mainly with the aim of benefiting commerce. In 1747, a school, the Ecole des Ponts et Chaussées, was created, providing special training, linked at first to the Administration des Mines (1817) then later to the Ministère des Travaux Publics (1839). Engineers examined the various aspects of their work in France, focusing on the design, construction and the use of highways, waterways, and railways. Ecole des Ponts et Chaussées was a particularly intense center for learning and education, and through

its efforts to teach its student, the school inadvertently produced an important reference collection of structural photography. The School took trouble to integrate lessons derived from practical experience into its empirical approach. Photography turned out to be an ideal teaching aid for capturing the work of the engineers. In 1857, following a suggestion by one of the Bissons brothers, the School began teaching photography to its students, which continued until 1911. Davanne was the teacher from 1872 to 1886 , and the School published his 'Lectures on Photography' in 1883.

In 1876–1901 Davanne became chairman of Société française de photographie board.

In 1877 he wrote *Impressions Photographiques aux encres grasses analogues à la lithographie*. In 1879 he started teaching at the Sorbonne, Paris. In 1891 he gave lectures at Conservatoire des Arts et Métiers and in 1901 he became the honorary president of the Société française de photographie. In 1904 he wrote "Protection due aux oeuvres photographiques et leur assimilation aux oeuvres artistiques" (Protection due to photographic works and their assimilation in works of art). He used Daguerreotype, calotype, salted paper, waxed, with wet collodion, albumenized. He lived at 82 Rue Neuve-des-Petits-Champs, Paris. Davanne produced photographs in a number of media. His work, including views of France, Germany, Italy, Spain, and North Africa, was frequently shown throughout Europe. Davanne also wrote extensively, including an essay on the protection of photographic works and their assimilation as works of art.

Davanne died on September 19, 1912 at St-Cloud.

JOHAN SWINNEN

See also: Inventions; Société Française de Photographie; Lithography; Société Héliographique Française; Niépce, Joseph Nicéphore; Baldus, Edouard; Régnault, Henri-Victor; Sutton, Thomas; Robert, Louis-Rémy; Le Secq, Henri; and Fenton, Roger.

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DAVIDSON, THOMAS (1798–1878)

English camera manufacturer and photographer

Thomas Davidson was born in Deehunt, Northumberland in 1798, where his father was a road labourer. He had minimal schooling and was apprenticed as a weaver. Aged twenty, in 1818, he married, but by this time had discovered his natural skills as a mechanic. In 1836, he moved, with his family, to Edinburgh, and working initially for an optician named John Davis, and subsequently for the rather more prominent horologist, Robert Bryson, Davidson set up in business in 1839, just in time to benefit from the new mania for photography.

At least one of his daguerreotype cameras survives, which, although unsigned, is as described by Davidson in a paper which he read before the Society of Arts for Scotland in 1841, and for which he was awarded the Society's Silver Medal. Davidson himself took daguerreotypes (some examples of which survive) out of the high window of his premises in Edinburgh's High Street, which apparently sold so well that he had to take on extra staff, while he continued to make improvements to apparatus. Among his Scottish clients were James Howie, the University of St. Andrews, James Good Tunny (and his more than 200 amateur students), and Sir David Brewster's son, Captain Henry Brewster. South of the Border, Henry Collen, Antoine Claudet and Calvert Richard Jones all extolled the virtues of his lens-making. The Davidson lens of the Edinburgh calotypists, D.O. Hill and Robert Adamson, survives in the collection at Bradford, and has been described as an 'unsymmetrical doublet lens of about 17" focal length and maximum aperture of about *f*10.'

With the eager participation of amateurs, especially in the Scottish capital, demand for Davidson's lenses remained high into the wet collodion period, and he should have been a prosperous man. But it was not to be; Davidson had poor commercial sense, and his photographic business failed after about fifteen years. He retired to his native Northumberland, where he died in June 1878.

A.D. MORRISON-LOW

DAVISON, GEORGE (1854–1930)

George Davison was one of the most important figures in the development of Pictorial photography at the end of the nineteenth century. A founder member of The Linked Ring, he was a highly influential figure, exhibiting widely and writing extensively. His position as Managing Director of Kodak Ltd brought him affluence as well as influence.

George Davison was born in Lowestoft, Suffolk, in September 1854. From a comparatively modest family background—his father was a shipyard carpenter—he alone of his siblings received a secondary education. In his late teens he passed the entry examination for the Civil Service and in 1874 he became a clerk in the Exchequer and Audit Office in Somerset House, London. Davison first took up photography in about 1885 and

joined the Camera Club when it opened in November that year, becoming honorary secretary the following year. He first exhibited his work in 1886, showing six pictures in the Photographic Society of Great Britain Exhibition. He became a member of the society in November 1886.

An advocate of Naturalistic photography and selective focusing, Davison initially espoused the ideas of P H. Emerson. However, their relationship soon deteriorated into a series of bitter exchanges published in the photographic press.

Davison experimented widely with different techniques and processes in his efforts to achieve the impressionistic effect which he desired in his work. He was one of the first to use a pin-hole camera for pictorial photography. In 1890, one of his pin-hole photographs, *An Old Farmstead* (later retitled *The Onion Field*) was awarded a medal at the Photographic Society of Great Britain's annual exhibition. A prime example of the 'fuzzy' school of photography, this picture provoked considerable comment and discussion.

The following year, Davison found himself at the centre of a controversy which blew up surrounding his late submission of entries for that year's Photographic Society exhibition. Through a combination of misunderstandings, personal rivalries, petty bureaucracy and inflexibility, this minor incident escalated into a situation where Davison, together with a number of other prominent members of the society, including the vice-president H. P. Robinson, resigned their membership. In 1892 this secessionist group formed an association called *The Linked Ring* and established an annual Photographic Salon, the first of which was held in October 1893. Each 'Link' was given a name—Davison being known as 'Deputy High Executioner' because of his shared responsibility with Robinson for 'hanging' exhibitions. Within a couple of years, the Photographic Salon had established itself as one of the most important events in the photographic calendar and presented a serious challenge to the primacy of the Photographic Society exhibition.

In 1889, George Eastman had invited Davison to become a director of the newly-established London branch of the Eastman Photographic Materials Company. Davison bought twenty-five shares at £10 each, using money borrowed from a friend—an investment which was to prove extremely profitable. This was the beginning of Davison's long association with George Eastman and Kodak. In 1897, he left his, now senior, position at the Audit Office to become assistant manger of the Eastman Photographic Materials Company. One of his first tasks was to organise a major competition and exhibition of amateur photography. The exhibition, presented at the New Gallery, Regent Street, London, was a spectacular success and was visited by more than 25,000 people during its three-week run. Davison gave free Kodak cameras and film to his photographer friends in return for permission to use their pictures for advertising purposes. These included, Paul Martin, Eustace Calland, James Craig Annan and, most prolifically, Frank Meadow Sutcliffe. In 1898, Davison became deputy managing director of Kodak Limited, as it had then become. With an annual salary of £1,000 and owning thousands of shares in the company, he was now an extremely wealthy man. The sudden death of the managing director, George Dickman, resulted in Davison taking over the post in March 1900.

Despite his growing corporate responsibilities, Davison continued to photograph and to exhibit his work. In 1898 he showed gum-bichromate prints for the first time and the following year he started what was to become an annual custom of sending photogravure reproductions of his photographs to his friends as New Year's gifts. Inevitably, however, his output declined. In 1908, for the first time, the Photographic Salon contained none of his work. By this time, The Linked Ring had lost its original impetus and sense of unity. In 1910, it was agreed that no exhibition would be held, effectively marking the end of The Linked Ring. A group led by Davison formed the London Secession which held a single exhibition in May 1911. Davison exhibited a single print, of Harlech Castle. It was to be his last contribution to a photographic exhibition. By this time, Davison was preoccupied with other matters.

Undoubtedly stemming from his humble origins, Davison had a life-long interest in social reform. Although more of a committed Christian Socialist than an anarchist in the Marxist sense, he had been associated with anarchist organisations for several years. In 1908, George Eastman, considering him to be unsuited to the cut and thrust of commerce, asked Davison to resign as managing director of Kodak Ltd. Davison remained on the board of the company for a few years but his political activities had made his position untenable in Eastman's eyes. In 1912 he was forced to resign his directorship, ending twenty-four years of association with the company.

Davison moved to Harlech, North Wales, where his splendid house became a focus for artistic and political gatherings. As his health declined in the 1920s, he spent more time at his home near Antibes in the south of France, where he died in December, 1930.

COLIN HARDING

See also: The Linked Ring; Emerson, Peter Henry; Naturalistic Photography; and Pictorialism.

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DAVY, SIR HUMPHREY (1778–1829)
English chemist and inventor

Davy's name is forever linked with his famous miner's lamp introduced in 1815. His name is also linked that of Thomas Wedgewood and the experiments conducted by the two men, together and separately, towards the establishment of a photographic process.

He was born in Penzance in 1778, moving to Bristol where he was apprenticed to a surgeon, and in 1797 he embarked on a course of study in the sciences.

The Wedgewood/Davy experiments with silver nitrate in the early 1800s, place Davy's work at the dawn of photography. The two men reportedly produced visible imagery on both leather and paper, which continued to blacken as they could not ultimately stop the action of light and 'fix' the image. Much of the work was Wedgewood's, with Davy adding important notation before presenting the paper 'An Account of a Method of Copying Paintings upon Glass, and Making Profiles by the Agency of Light upon the Nitrate of Silver' to the Royal Institution, London, in 1802. These experiments, however, are not his sole contribution to the evolution of the medium.

In 1802 he was appointed Professor of Chemistry at the Royal Institution, and during the period 1800-1815, his chemical exploration and experimentation identified and isolated the elements sodium and potassium, so central to photographic chemistry, and by 1815 he had discovered iodine, another key component of the photographic process.

JOHN HANNAVY

DAY, FRED HOLLAND (1864–1933)
American photographer and philanthropist

Day was born in South Dedham (later incorporated into Norwood), Massachusetts on 23 July 1864, the only child of wealthy and supportive parents. His father Lewis, a successful leather merchant and entrepreneur, was based in Boston where the Day family also had an apartment. Day's mother, Anna Smith Day, was philanthropic and individualistic, involved in the cultural, social, and charitable life of Boston. Day inherited this trait of helping and supporting and had the time and wealth to pursue the altruism which was to become the most important aspect of his life after 1900.

Day's lifelong passions were literature, art, photography, and aesthetics. By his early twenties, he had amassed large collections of works relating to the English Romantic poet John Keats and the French writer Honoré de Balzac. He had also become interested in photography, writing to a friend, Ada Langley, in the summer of 1887 "[I] have become a full-fledged amateur in the art of photography, and a most delicious time I've had of it, too...."

This same year, he struck up a relationship with the forthright Boston Irish Catholic poet, Louise Imogen Guiney. The question of romance was soon removed from the equation but the two remained friends for over 30 years. Day never married and, while it is widely assumed that he was homosexual, his sexual orientation was, like much else about him, a very private matter which remains unclear.

Until 1888, Day fitted his photography around work as a depository secretary witha bookseller. After he left this employment he regularly travelled to Europe, especially London, for several months at a time, pursuing Keatsiana (eventually unveiling a bust of John Keats at Hampstead Parish Church in July 1894, paid for by public subscription organized and collected by Day and Guiney in Boston) and meeting luminaries like William Morris, William Butler Yeats, Arthur Symons and Oscar Wilde (whose autograph Day had secured as a schoolboy in 1882 during Wilde's U.S. lecture tour) thus establishing connections that would bear fruit in both his publishing and photographic careers.

During 1889 or 1890, Day also met the British bookseller turned photographer, Frederick H. Evans. Evans not only involved Day in the British photography scene but also got him interested in the powerful and stylized drawings of Aubrey Beardsley, then still a teenager. Day and Evans had much in common—books, art, photography and a fascination with visionaries, and they remained close friends, exchanging photographs and ideas, for the rest of their lives. Day's increasing links with the British photographic scene, through Evans and George Davison and the growing confidence and excellence of his own photography meant that he was elected to the British photographic society, the Brotherhood of The Linked Ring, on 26 November 1895. By this time, Day had begun to use the name F. Holland Day for his photography, finding it more appropriate to his status as an artist than the colloquial "Fred."

From 1893 to 1899, Day set up and self-financed a publishing house with the writer and editor Herbert Copeland. The publishing company of Copeland and Day, based in Boston, was initially much influenced by the ethos and style of William Morris's Kelmscott Press (set up in 1891) and the resurgent Arts and Crafts movement in Europe and the United States. Copeland and Day never made a profit during its six years of operation but produced almost a hundred courageously and beautifully designed and printed books, gaining notoriety (and much needed sales) by publishing the American edition

of Wilde's *Salome*, illustrated with Beardsley drawings (1894), and a journal, *The Yellow Book* (1894–1896), again illustrated by Beardsley until 1895.

By the time the publishing house closed in 1899, Day had already taken on a new role as one of the undisputed leaders, along with the New-York based Alfred Stieglitz, of the American art photography movement. Both men realized that in order to establish photography as an art form in an era before the widespread proliferation of galleries devoted solely to photography, images had to be supported by lectures, articles, interviews, and exhibitions, and by encouraging mutually supportive groups of like-minded individuals. An eventual stand-off between Day, who disliked New York and avoided visiting the city at all costs, and Stieglitz, who felt much the same about Boston, was inevitable.

Day's photography blossomed astonishingly rapidly in the 1890s. He photographed his friends and colleagues, initially concentrating on portraits of women, often using a sepia-toned printing-out paper. He also began to photograph a variety of exotic female, and then male, models, dressing them in flowing draperies and with props of Middle Eastern, African, or Greek inspiration. The years 1896–1897, when he had established himself in a new rented studio at 9 Pinckney Street in Boston, were seminal in his development as a photographer. He began to photograph male nudes or partially draped figures, often using black models of supreme grace and beauty (the most notable being J. Alexandre Skeete, a professional model and an aspiring artist himself). He did so with a control of light and shadow on skin tones, and a placement of his subjects in an artistic and allegorical metier, that rendered them on the aesthetically acceptable side of the erotic. The models featured in such photographs as "Ebony and Ivory," "An Ethiopian," "Menelek," "Nubia," and "Smoker," was variously accessorized with an ivory (actually plaster) statuette, body jewellery, robes, pigeon-wing head-dress, leopard skin, bows and spear—all the accoutrements of an imagined exoticism.

These photographs were much exhibited, much reviewed, and much discussed. Day trod a very fine line between homoeroticism and the depiction of the male body as a "Greek" ideal. While the photographs in this series have an undoubted erotic and sensual charge, they were not taken, unlike the photographs of Day's contemporary Baron von Gloeden, solely with the male viewer in mind . Day defended his ideals with consummate skill in public lectures and in articles in both the national and photographic press. For instance, in an article of July 1898 ("Art and the Camera," published in Stieglitz's journal *Camera Notes*), Day outlined his three rules for producing art with the camera, observing that "Boticelli's circle was not made with a compass, neither is art produced by the lens and bellows" but by the artist using the lens and bellows in the eye, the heart, and the brain respectively.

From July to September 1898 Day, although seemingly holding no strong beliefs in any organized religion himself, began to work in earnest on a series of 250 negatives of sacred subjects depicting the events around the Crucifixion in an attempt to use the camera to produce religious art (much as Julia Margaret Cameron had done with her *Madonna* series of 1864–1865). His first foray into this controversial territory in 1896, "The Entombment," had shown Day himself as Christ, prostrate with painted wounds and a cardboard halo at a rakish angle. As his first recorded self-portrait, it was an astonishingly bold choice. It became obvious to the photographic world that Day was not only a man who took calculated risks but was able to carry them off with undeniable photographic expertise and aesthetic judgement. These ideas were to culminate in the final photographs in the Crucifixion series, "The Seven Words," a set of self-portraits as the dying Christ. The visual style of the Crucifixion work was also strongly influenced by the passion plays of Oberammergau (which Day had seen on a trip to Bavaria in 1890), as well as by his knowledge of Renaissance art, his reading of Walter Pater, Oscar Wilde, Algernon Charles Swinburne and the rites of the Rosicrucian sect, which performed ritualistic crucifixion ceremonies.

The outdoor Crucifixion scenes were photographed near Day's home in Norwood—Roman soldiers, weeping women, onlookers—were friends and hired actors. The meticulous attention to authentic detail, such as a crown of thorns and cedar wood imported from Lebanon for the cross, has been well documented elsewhere in publications by Jussim, Crump, and Curtis (see Further Reading). The close-up portraits, "The Seven Words," taken at Day's Norwood family home, used a mirror attached to the camera and a long shutter release cable to achieve the correct facial expressions.

In an identification fashionable at the time, Day doubtless saw the crucified Jesus as a symbol for the suffering and misunderstood artist—and especially aesthetes such as Keats, Wilde, Beardsley, and Day himself. The photographs aroused initial controversy, tempered by eventual praise. A private showing to members of various religious groupings in Day's studio received a remarkably open reception.

> To this exhibition there came people of all shades of religious belief—Quakers, Jews, Anglicans, and Roman Catholics, Nonconformists, Swedenborgian, priest and clergymen. Among them many were known to hold adverse opinions before seeing the prints, but with the exception of a single individual, those prejudices entirely disappeared. (Day, "Sacred Art and the Camera," *Photogram*, 6 (1899): 97–99)

Day's profile in Boston, and in American art photography circles, was high. In 1899, he worked with the wealthy Boston painter and photographer Sarah Choate Sears to secure a permanent gallery space for photography at the city's Museum of Fine Arts. This was intended to act as a photographic salon for exhibitions of the pictorial photography of a much discussed but eventually unrealized grouping of Boston artist photographers, to be named the American Association of Artistic photography , based along the lines of the Linked Ring. Despite the failure of this idea in Boston Day decided to press ahead and arrange an exhibition in London.

In April 1900 he sailed to London with several hundred photographs by over forty American pictorial photographers, among them Edward Steichen, Alvin Langdon Coburn, a distant cousin of Day's, Gertrude Kasebier, and Clarence White. In October 1900, the exhibition of *The New School of American Photography* opened at the London headquarters of the Royal Photographic Society, after his request to show it at the annual Linked Ring Salon was refused thanks to a last-minute intervention by Stieglitz.

The exhibition was a *succes de scandal*. Day showed 113 of his own photographs and his subject matter—naked black men and religious scenes—and his elaborate methods of presenting his photographs on multi-layered coloured paper supports in ornate gold and wooden frames, were unlike anything seen in a photographic exhibition in London before. Reviews in the photographic press veered between vitriolic sarcasm and heady praise. The photographs, most especially the contributions of the 21-year-old Edward Steichen, shocked London to the core.

Day's diplomatic skills, determined conviction and personal charisma won him a wide circle of admirers, while his personal appearance—brocade waistcoats, swirling capes, auxiliary wardrobe of Oriental and Middle Eastern attire, and stylishly coiffed hair—declared him to be an exotic aesthete in the tradition of the now disgraced Oscar Wilde. Like Wilde, Day believed that publicity, be it good or bad, was better than apathy and silence. In December 1900, just a few days after Wilde died in Paris, Day and his controversial exhibition arrived there. The French reception of *The New School of American Photography*, which showed at the Photo-Club de Paris from February to March 1901 and was championed by the influential Robert Demachy, was this time wholly favourable.

Back in Boston later in 1901, Day threw himself into re-establishing his ties to his roots. He also began to spend more time and money mentoring and educating young immigrant boys, funding them through school, art and literature classes and teaching them photography. An earlier protégé and photographic model of 1896, a 13-year-old Lebanese immigrant called Kahlil Gibran, was blossoming into a poet, author, and artist thanks to Day's guidance (Gibran's book *The Prophet*, published in 1923, now enjoys cult status).

In 1901, Alfred Stieglitz finally established his own coterie of American pictorial photographers, the Photo-Secession, firmly rooted in his native New York. Two years later he launched *Camera Work,* probably the most beautiful, lavish, radical and opinionated photography journal ever published. Day had lost the chance to be the front-runner in American photography but, eventually, seems not to have cared unduly, perhaps glad to hand over the baton to a more energetic and single-minded participant.

In 1904 Day's new studio in the Harcourt Building in Irvington Street burnt down. He lost much of his previous life in photography; 2,000 negatives taken over the previous 18 years, an unknown number of prints, his collection of photographs by friends, and his cameras. The fire also destroyed some of his art collection, antiques, and books.

In many ways, the fire and destruction seem to have acted as a cleansing and liberating process; from 1905 onwards Day's photography was quite different. Shot through with openness, freshness, liberation and freedom, frankness and honesty, humour and joy, it became astonishingly modern. For the rest of his active photographic career until 1912, he concentrated on marrying a celebration of nature with a celebration of the naked male body and also began to explore portraiture of close friends from a new and vivid angle (see the entry in Fitzroy Dearborn's *Encyclopedia of 20th-Century Photography*).

In his forties, Day simplified his life, spending eight months of each year at his property in Maine where he built a house to enable the establishment of a Utopian community where he could entertain friends and organize summer schools for immigrant boys raised in the Boston slums. From 1916 until his death in 1933, Day retired back to his family mansion in Norwood, physically bedbound but still mentally active.

PAM ROBERTS

See also: Evans, Frederick H.; Davison, George; Brotherhood of The Linked Ring; Stieglitz, Alfred; Cameron, Julia Margaret; Pictorial Photography; Steichen, Edward, Coburn, Alvin Langdon; White, Clarence; Käsebier, Gertrude; Royal Photographic Society; Photo-Club de Paris; and Demachy, Robert.

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DE AZEVEDO, MILITÃO AUGUSTO (1837–1905)

Brazilian photographer and actor Militão Augusto de Azevedo was born in Rio de Janeiro on June 18, 1837, to Antonio Inácio de Azevedo and Lauriana Augusto de Azevedo. He studied photography in Europe in 1878, and may have worked with Alphonse J. Liébert. Known professionally as Militão, he worked for the Carneiro & Smith photographic studio in Rio in the 1850s, and by 1862, he ran the Carneiro & Gaspar studio in São Paulo. He produced an *Album of Views of the São Paulo Railway* in 1865 and several urban landscapes in about 1870. In 1875, he bought the studio and renamed it Photographia Americana. The business failed in 1885 and he went to Europe, returning with the idea for his *Comparative Album of Views of the City of São Paulo, 1862/1887.* He considered this collection of 60 original albumen photographs his masterwork and swansong. Militão also produced *carte-de-visites* and portraits of people from all walks of life, including black poet and abolitionist Luís Gama. He died in São Paulo on May 24, 1905. Collections: Museu Paulista, São Paulo; Shomburg Center for Research in Black Culture, New York; Moreira Salles Institute, São Paulo/Rio de Janeiro; Emanoel Araújo Collection, São Paulo.

SABRINA GLEDHILL

DE BANVILLE, VICOMTE AYMARD ATHANASE (1837–1917)

French photographer

As a member of the 1863 expedition led by the prominent French Egyptologist Vicomte Emmanuel de Rougé, de Banville spent several months photographing the sites and monuments of Egypt. It is unclear whether he worked directly under the supervision of de Rougé or selected his own subjects. Prior to his work in Egypt, he had been an amateur painter and sculptor and had made some attempts at photography as early as 1860. While in Egypt he produced a concentrated body of work, more than 200 photographs in less than six months. That work formed the basis for a lavish publication, *Monuments Egyptiens* (1865), which included 165 of his photographs. He exhibited a number of the prints in the Société Française de Photographie exhibition that year. It seems clear that de Banville's position in society and his association with de Rougé, the successor to Champollion, gave his work a higher profile than that of other photographers working in Egypt at that time. He was awarded the Legion of Honor for his work.

KATHLEEN HOWE

DE BEAUCORPS, GUSTAVE (1825–1906)

French photographer

Born into an aristocratic family in France, the count Gustave de Beaucorps began to photograph in the mid 1850s. A talented amateur, he is best known for his architectural photographs of monuments and landscapes taken on travels through western Europe. Algeria, Egypt, Morocco, Palestine, and Turkey. His photographs, primarily studies of architecture, landscape and figures made upon his travels, were generally bound in albums. De Beaucorps also collected Spanish and Arab decorative arts, some of which he photographed. Although de Beaucorps primarily employed the waxed paper negative process to make both salted paper and albumen prints, a few albumen prints from wet collodion glass negatives have been identified. A member of the Société Française de Photographie, Beaucorps exhibited with the S.F.P in 1859, 1861, and 1869. His work is included at the Canadian Center for Architecture, Montréal, the Bibliothèque Nationale, Paris, and the Société Française de Photographie, Paris.

SARAH KENNEL

DE BRÉBISSON, ALPHONSE (1798–1872)

Alphonse de Brébisson was born in Falaise, Normandy, where he lived all his life and where he acquired a reputation as an eminent botanist. He was interested in photography since 1839, and began researching methods to simplify and improve the processes of the daguerreotype. The results of this work led to the publication of *De quelques modifications apportées aux procédés du daguerréotype* (1841). He experimented with negative paper photography and in 1848, one year after the introduction of the calotype in France, he published notes on the subject. He later used albumen on glass, collodion

on glass, and subsequently Taupenot's dry albumenized collodion process. He was one of the first to use wet collodion photography in France. De Brebisson published several papers on the subject, including a treatise on 'instantaneous dry collodion' in 1863. Through these publications he was instrumental in the popularization of collodion photography. He was the first to make a complete method of photography with collodion (1852) in France. Alphonse published several papers on the subject (of which consisted a treaty of instantaneous dry collodion in 1863).

Brébisson practiced the stereoscopy, microphotography (applied to botany), and the carbon process as well, which he developed himself. He also invented a printing frame. Alphonse printed his tests as paper versions according to the method developed by Blanquart-Evrard in 1847. He collaborated in *l'Album photographique de l'artiste et de l'amateur* published by Blanquart-Evrard in 1851. As a founding member of the Société française de photographie in 1854, he remained faithful the society until his death. He participated in three of their exhibitions, in 1857 with the studies of landscapes on albumenized collodion; in 1859 with the landscapes on albumenized collodion printed with uranium and gold according to the method of Niépce-of-Saint-Victor; and in 1861 with albumenized dry collodions of the monuments of Falaise and the surroundings area. He also took part in two exhibitions of Alençon (1858, 1865), in l'exposition de Marseille in 1861 and the International Exhibition of 1862 in London. In 1859, Alphonse provided within one frame, three samples of the same image of the Rocks of Noron, which were obtained successively by uranium oxide nitrate, cerargyrite, and coal. A critic evoked these tests: "under skilful and exerted hands all the processes are good; there is such a similarity between these three tests, which one would be embarrassed of saying which is the best "(Re-examined photographic). With such tests, the process of this experimentation became well known outside of the laboratory of the scientists, allowing the public too to participate.

Almost all of the daguerreotypes and negative paper of Brébisson's disappeared, but an important a number of albumen and collodion plates were preserved with the Photographic archives and the BNF. His oeuvre consists of very diverse scenes: portraits, landscapes, monuments, nature, and reproductions of other works. In 1865, on his way to Alençon, he photographed his famously artistic Falaise exposure of 1864 (process with tannin) and a reproduction of an engraving. All the portraits taken by the end of 1840 were on negative paper, consisted of self-portraits in which he only posed with his friend Humbert de Molard, and images of his family. He experimented with all genres and his talent undoubtedly was displayed best with landscape photography. He took many shots of Falaise and the surrounding area in various formats (30 × 40 cm or 21 × 27 cm), in accordance to negative paper or glass with albumen. Alphonse had a predilection for edges of rivers, the reflective quality of water, and the underwoods. In these landscapes, he illustrated a great sensitivity to the atmosphere and the luminous effects.

In 1861, Felix Deriège was filled with wonder inspired by Brébisson's landscapes, in particular by the image of la Saint-Trinité de Falaise. His only reservation related to the tone of the deer, due to the use of uranium oxide. Apart from his oeuvres, Brébisson left an album to the Paris, Musée of Orsay, which contained signed test images of the great names of the photography of the time like Hippolyte Bayard; Louis de Clercq; Andre Giroux; Gustave le Gray; Henri le Secq; Charles Nègre; and Joseph Vigier. To these names of course, it is necessary to add that of Domenica Gaumé, professor of drawing in Mans, with whom Brébisson began photography, and Edmond Bacot and Charles Ancelle.

Alphonse de Brébisson typifies the inquisitive amateur. He represented the perpetually, inventive spirit having followed all the stages of the new medium, and running tests himself with all the techniques and all subjects. He was greeted by the critics as an "intrepid researcher" (photographic Review, 1859), and as a" man of taste and…[an] experienced expert" (Ernest Lacan, 1861). With his qualities as a man of science, one could combine those of an aesthetic sensitivity to the beauty of nature and ability to compose an image.

HELENE BOCARD

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DE CLERQ, LOUIS (1836–1902)

French archaeologist and photographer

Born Louis-Constantin-Henri-François-Xavier De Clerq to a wealthy family in Northern France, De Clercq, was from an early age a passionate amateur archaeologist

de Clerq, Louis. Denderah, Porte d' Entrée.
The Metropolitan Museum of Art, Gilman Collection, Gift of The Howard Gilman Foundation, 2005 [2005.100.500.4 (35)] Image © The Metropolitan Museum of Art.

and photographer. In August 1859 he joined an expedition organized by Emmanuel-Guillaume Rey, under the aegis of the Ministry of Public Education, to study Crusader architecture in Syria and Asia Minor. After spending six months with Rey, De Clercq continued to travel through Syria, Palestine, Egypt and Spain photographing architectural ruins, landscapes, cities, and rural scenes using the waxed paper negative process, possibly because it was less cumbersome than using collodion glass negatives. He returned to France in 1860 and published the result of his travels in a six-volume work entitled *Voyage en Orient, 1859–1860*. Consisting of 222 prints (primarily albumen) made from negatives measuring about 21.5 × 28 cm and several panoramas made from negatives joined together, *Voyage en Orient* reveals de Clercq's affinities for sweeping panoramas, dramatic chiaroscuro lighting, and stark compositions dominated by architectural masses. In 1861, de Clercq exhibited the entire *Voyage en Orient* at the *Société Française de Photographie's* fourth exhibition. In 1862, he exhibited three photographs at the Universal Exhibition in London, where he received an honorable mention. Institutions with complete sets of *Voyage en Orient* include the Gilman Paper Company collection at Metropolitan Museum of Art, New York; The Canadian Center for Architecture, Montréal; The Louvre, Paris; and the Musée d'Orsay, Paris.

Sarah Kennel

DE LA RUE, WARREN (1815–1889)

This English astronomer, chemist and physicist is best known for his pioneering work on astronomical photography, which opened up a tremendous series of opportunities for astronomers. However, he had a varied career in more than one scientific field, and was himself a craftsman, as well as an industrial inventor.

Warren was the son of Thomas de la Rue. His father, Thomas de la Rue, who had been a newspaper publisher in Guernsey, later founded a large firm of printers and stationers in London in 1821. On completion of his education at the Collège Saint-Barbe in Paris, Warren began working at his father's printing business, but in his spare time he began conducted research into chemistry and electricity in his spare time. In 1829 he had made the first known attempt to produce an incandescent light bulb. Although an effective design, his use of platinum for the filament made it commercially unviable. Between 1836 and 1848 he published several papers into his findings on both chemistry and electricity. Warren's interest in astronomy was sparked while watching his friend, the Scottish engineer, James Nasmyth (1808–1890) at work on the casting of a speculum for use in a telescope for observing the sky at night and this caused de la Rue's own thoughts to turn to astronomy. De la Rue later commissioned Nasmyth to make him a 13-inch speculum which Warren ground and polished himself and used in the construction of a reflecting telescope in 1850, which Warren then used to observe and make drawings of celestial objects.

In 1851 Warren saw a daguerreotype of the moon by G. P. Bond exhibited at the Great Exhibition in London. When de la Rue saw the daguerreotype of the moon he was inspired to attempt to use the wet collodion process to take photographs of the surface of the moon. The wet collodion photographic process had been only recently

devised. It was less expensive to produce than the daguerreotype, and had the added benefit of providing a single glass negative from which multiple positive photographic prints could be generated. By 1854 de la Rue had succeeded in producing well-defined photographic images of the surface of the moon which would not be bettered until the 1960s. The cameras he used to capture these images, which would have been attached to his 13-inch reflecting telescope, are held by the Museum of the History of Science at the University of Oxford. Stereoscopic views de la Rue's lunar photographs were later made commercially available to the general public.

In 1854 de la Rue was approached by Kew Observatory, who had in turn been contacted by John Herschel, who had convinced Kew of the need for daily photographs of the surface of the sun. For this purpose de la Rue invented a telescopic device known as a *photoheliograph* for the purpose of taking photographs of the surface of the sun. The device was built by the noted camera maker, Andrew Ross, to de la Rue's specifications. An eyepiece was used to project an enlarged image onto a wet collodion plate. In this way, on sunny days, over 2700 photographs were taken of the surface of the sun at the observatory at Kew between (March) 1858 and 1872, and then, using the same device, from the Royal Observatory at Greenwich from 1873 until 1882. The images produced were approximately ten centimetres in diameter and clearly showed sunspots and faculae. The original *photoheliograph* is now held by the Science Museum in London.

From 1856 to 1862, de la Ruepublished papers on chemistry in collaboration with Dr Hugo Muller twice President of the Chemical Society.

In 1860 de la Rue took his *photoheliograph* to Rivabellosa, in Spain, to record a total eclipse on the 18 July. Luckily, the sky was clear for the event and of the thirty-five good plates that de la Rue secured, one was a particularly stunning image of 'totality.' This image, when considered in conjunction with another photograph of the eclipse taken by Secchi 400km to the south east of where de la Rue was based, provided conclusive evidence that the corona that becomes visible during a total eclipse belongs to the sun, rather than to the moon. In 1862 de la Rue received the Gold Medal from Royal Astronomical Society and was its President from 1864 to 1866. In 1864 he was awarded the Royal medal from the Royal Society. From 1868 to 1883 he investigated the discharge of electricity through gases by means of a battery of over fourteen thousand silver chloride cells, which he invented for the process.

By 1873 de la Rue's eyesight was failing. He sold his observatory and gifted most of his equipment to the University of Oxford. By then he had discovered over five hundred nebulae. He died in London on the 19 April 1889. A crater on the north-east portion of the near side of the moon measuring 134 metres in diameter has since been named after him.

Brian Liddy

DE MEYER, BARON ADOLPH (1868–1946)

Photographer and writer

Baron Adolph de Meyer, as a photographer, was noted for his magnificent backlighting and elegant soft focus techniques, as a well as for his modernist experiments in his layouts and graphic design in his years at *Harper's Bazar.* (In 1929 the magazine became *Harper's Bazaar.*) The biographical details of de Meyer's life are not totally verified, since de Meyer is said to have fabricated certain details about his existence, often depending on the circumstances, depending upon what social circles he might find himself in. Gregarious and charming, de Meyer was socially adept in various settings.

The chronology listed here is primarily taken from two sources: *"The Collection of Alfred Stieglitz: Fifty Pioneers of Modern Photography"* by Weston Naef and *"De Meyer: A Singular Elegance"* by Anne Ehrenkranz.

In the 1880s, as de Meyer was coming of age, the new artistic currents of Symbolism and Impressionism were to have significant influence on the young de Meyer, just beginning to experiment with a camera. De Meyer's correspondence and friendship with Alfred Stieglitz, editor, photographer, and gallery owner, who was to fight tirelessly for the cause of photography as a Fine Art, was to serve as catalyst and support for de Meyer. The Secessionist exhibits in the United States and Europe were illustrative of amateur photographers' attempts in a variety of countries, to elevate photography from a solely documentary, technical medium to an aesthetic, artistic medium.

De Meyer's purchase, in 1903, of a special Pinkerton-Smith lens, ground sharply in the center, producing a soft focus effect, allowed him to produce dramatic, shadowy effects that evoked mystery and nuance. His photographs such as *"The Shadows in the Wall—Chrysanthemums,"* c. 1906 (Metropolitan Museum of New York, Alfred Stieglitz Collection), or *"Glass and Shadows,"* c.1909 (Baltimore Museum of Art), are works that carry the viewer into a transcendent realm that is ethereal and suggestive.

Stieglitz's decision to include de Meyer in two "Camera Work" issues, as well as to include him in Photo-Secessionist exhibits at his 291 Fifth Avenue, New York City gallery, was important for de Meyer. De Meyer's solo show at the Photo-Secession galleries, opening in February 1909, included four still lifes and three portraits. Issue number 40 of "Camera

Work" was devoted to de Meyer's work with fourteen de Meyer photogravures. Among the images in that issue was an example of one of his haunting and exotic portraits—"*Marchesa Luisa Casati,"* 1912 (Baltimore Art Museum). De Meyer had met Casati in Venice, where she frequently appeared in exotic dress designed by Leon Bakst, and floated down the Grand Canal in a gondola accompanied by exotic creatures and an entourage of servants. In the portrait the viewer meets the Marchesa head on, her chin resting on her bejeweled hands, her large dark eyes, searching, and piercing the viewer's eyes.

The signature that de Meyer used on many of his mats was influenced by the style of the Vienna Secessionists for their graphics. As Stieglitz, de Meyer was also drawn to the autochrome process in 1907, and experimented with color imagery and the subtle nuances the autochrome process allowed.

De Meyer was drawn to the work of the German and Austrian Symbolists, particularly Gustav Klimt, as he attempted in portraits such as the portrait of Marchesa Luisa Casati, his wife Olga, Gertrude Vanderbilt Whitney, Josephine Baker, or Vaslav Nijinsky, to go 'beneath the surface' of an elegant exterior, probing and suggesting a complicated, and sometimes troubled interior.

De Meyer photographed his wife Olga, frequently. A 1900 untitled portrait of her (International Museum of Photography at George Eastman House, Rochester, NY) shows her in profile, with a lacy shawl, set against the soft focus background of a grape arbor. Her hair is swept upward, visually integrated with the grape vine tendrils, linking the young woman with the fruits of nature. Her regal features made Olga a natural model.

In his numerous images of Nijinsky, de Meyer captures not only the likeness and adeptness of Nijinsky's dance techniques, but also transports the viewer into Nijinsky's world of fantasy and grace. (Nijinsky's career ended in 1919 due to insanity, three years after de Meyer's portrait of him as the "*Favorite Slave in Schéhérazade"* appeared in "*Vogue,"* May 15, 1916.)

De Meyer's magazine work included not only his photographs, but also his writing editorials, beginning in 1915 at *"Vogue."* His writings were primarily observations of social life and the fashion world. De Meyer's magazine photographs were noted for their luminosity that highlighted jewelry, exotic fabrics and the sheen of his models' hair. One of his most noted series in "*Vogue"* was a 1918 series entitled the *"Bride's Yearbook."*

De Meyer's move to "*Harper's Bazar"* in 1922, inaugurated his experimentation with a more "modernist look" as his layouts began to employ sharp geometric shapes, sometimes fractured, and layered, suggesting the influence of Cubist or Bauhaus forms.

De Meyer's wife, Olga, died during the end of his time at "*Harper's Bazar*." Her death left de Meyer somewhat adrift circulating around Europe, often accompanied by younger men with whom he was reported to have had a number of affairs. Indeed, when he fled Europe in 1938 to escape the oncoming war, he brought one of these young men, Ernest, to the United States with him to live in Los Angeles. Ernest served first as de Meyer's chauffeur and then was later adopted by de Meyer to validate his presence in the United States.

De Meyer, in his last years in Los Angeles, did a few society portraits, wrote a screenplay, an autobiography, and some romantic novels, none of which were published. In 1940 Mrs. Edward G. Robinson organized an exhibition of his work. But since he had destroyed much of his photographic work, he had to contact Stieglitz to find out what Stieglitz had.

De Meyer died in 1946 of coronary thrombosis, at age seventy-eight. His obituary in the *Los Angeles Times* did not mention his photographic work. His remaining estate was left primarily to his lover, and adopted son, Ernest; in 1980 much of that material was auctioned at Sotheby's in New York.

De Meyer's photographic work did indeed help lift photography to the realm of fine art. From his soft focus pictorial images to his Modernist magazine layouts, de Meyer's beautifully lit portraits, of all levels of society from the few peasants of the European and North African countryside to the affluent upper-class, to his magazine layouts, to his elegant but simple still lifes-these works provide a lasting legacy, illustrating the power of the photographic medium beginning early in the twentieth century, in black and white, and in color.

KATHERINE HOFFMAN

Biography

1868—Born Adolph Meyer to Adele Watson and Adolphus Meyer (later adopted name Meyer-Watson; Baron not used until after 1898).

1870s–1880s—Childhood in Paris and Germany.

1894–1895—Exhibits photographs in London, Paris, Brussels, New York; Listing, Dresden, 8 Park Strasse, as addresss

1896—Moves to London, joins London Camera Club, exhibits work at London Camera Club, Royal Photographic Society; becomes part of London upper class social circles related to the Prince of Wales.

1897—Meets and marries Olga Alberta, reportedly the illegitimate daughter of the Prince of Wales (later Edward VII) and Blanche, Duchess of Caraciolla; Photograph of Olga published in "*The Photographic Times*".

1898–1899—Joins Royal Photographic Society and elected to The Linked Ring

1900—Photographs shown in exhibit organized by F. Holland Day: "New School of American Photogra-

phy"; Travels around the world, visiting Japan, China, India, and Ceylon.

1903—Buys English Pinkerton-Smith lens that produces soft focus effect; Begins correspondence with Alfred Stieglitz while subscribing to "Camera Work"; Visits United States and stays with Gertrude Käsebier in Newport, Rhode Island, where she photographed him.

1907—Exhibited at Stieglitz's Photo-Secession galleries January 25-February 12, New York with work of George Seeley; Learns the autochrome process.

1908—Issue number 24 of *"Camera Work"* by Alfred Stieglitz was devoted entirely to de Meyer's work, including seven photogravures; Joint exhibit with Alum Langdon Coburn at Photo-Club of Paris; Resigns from The Linked Ring.

1909—Becomes fellow of Photo-Secession group in New York; Work exhibited again at Photo-Secession galleries: "The Exhibition of Photographs in Monochrome and Color by Baron Adolf de Meyer of London and Dresden," February 4-22; Meets Alfred Stieglitz in person in Germany.

1910—Included in Albright Art Gallery exhibit, organized by Stieglitz, 25 photographs shown.

1911—Exhibits autochrome at Newark Museum, "Modern Photography" exhibit organized by Max Weber and Clarence White, April.

1912—Photographs Vaslav Nijinsky in "Ballets Russes, *Prélude à l'Après-midi d'un Faune";* Shows photographs in Photo-Secession galleries ; Travels to the United States ; October issue of "*Camera Work*" devoted again to de Meyer—14 photogravures.

1914—Publishes book of photographs of Nijinsky and other members of the Ballet Russe; Flies to New York with wife after they were accused of being German spies; Hired by Condé Nast as "*Vogue's*" first full time photographer—signs contract to work only for "Vogue" and "Vanity Fair" for $100/week.

1916—Photographs Nijinsky as Favorite Slave in *Schéhérazade* in New York; an astrologer suggests he and his wife change names to Gayne (Adolph) and Mhahra (Olga).

1917—Begins designing clothes and doing interior design, new couture line called Gayne House.

1921—Leaves "*Vogue"* to work for Willliam Randolph Hearst's "Harper's Bazar"; By the early 1920s spends more time in Paris.

1922—Signs ten year contract with Hearst Corporation, seen as fashion connoisseur.

c. 1931—Olga de Meyer dies.

1938–1940s—Destroyed much of his own photographic work; returns to the United States; Settles in Hollywood.

1946—Dies January 6th of coronary thrombosis in Los Angeles.

See also: Stieglitz, Alfred.

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DE PRANGEY, JOSEPH-PHILIBERT GIRAULT (1804–1892)

French historian of architecture and daguerreotypist

Joseph-Philibert was born in Langres, October 21, 1804, to a medium-sized family. His father was a wealthy landowner. After studying at the college of Langres, he graduated in 1826, and continued his studies for a time while attending drawing classes of the School of Langres. I twas here that he met the future painter, Ziegler, who also had an interest in photography. During this time, he expressed an interest in architecture, practical painting and in watercolour. In 1836, he organized the historical and archaeological company of Langres, within which he served many functions.

After voyages to Germany, Italy, and Spain at the beginning of the 1830s, he turned to the study of Moorish art and architecture, in 1834. In 1836, *Monuments arabes et moresques de Cordoue, Séville et Grenade* appeared, and later, two other works were published in 1837 and 1839. The work is remembered for its scholarship as well as for the quality and the precision of the plates, which were based on the drawings of the author.

That same year, Joseph-Philibert exhibited at the Salon a painting "Promenade et tours d'enceinte de l'Alhambra", before publishing in 1841 a new work, *Essai sur l'architecture des Arabes et des Mores en Espagne, en Sicile et en Barbarie*. Girault de Prangey had worked with the daguerreotype since 1841. His first images were of the views from his villa of Courcelles, Langres, and its surroundings Chaumont, Troyes, including Paris, and in particular Notre-Dame and the of Tileries.

In 1842, Girault de Prangey went on a new lengthy trip to study in the Middle East. He left Marseilles, and travelled to Genoa, Rome, and Tivoli, Italy. His two year tour led him to Athens, Greece, Constantinople,

Turkey, Lebanon, Syria, Alep, Baalbek, Damas, Beirut, and Jerusalem near Palestine, and Cairo, Alexandria, Memphis, Thèbes, Louxor, Karnak, Philae, and Assouan in Egypt. Girault de Prangey took daguerreotypes of these places, primarily of monuments and landscapes but also some portraits as well.

In 1844 or 1845, he returned to France with more than one thousand plates and an abundance of written documents. The exceptional quality of these images was due both to his mastery of the chemistry and his compositional skills. Girault de Prangey used lengthened vertical or horizontal formats (panoramic), which were obtained by dividing the full plates (19 × 24 cm). These were used, resulting in strange images and unusual sizes (often 9.5 × 24 cm). Some of them were used for Arab illustrations *Monuments arabes d'Egypte, de Syrie, d'Asie Mineure dessinés de 1842 à 1845*, and *Monuments et paysages de l'Orient*, which were taken respectively in 1846 and 1851.

Girault de Prangey was elected as an Honorary member and Royal corresponding member of the Institute of British Architects in 1846. The beginning of the 1850s seems to have been devoted primarily to his field and his passion of botany, even though he continued to practise photography, and not just the daguerreotype but also stereoscopy during the 1860s. He died on December 7, 1892, in his villa of Tuaires with Courcelles-Valley-in Esnoms (Haute-Marne). In 2001, the Bibliotheque nationale acquired a major collection of nearly one hundred and fifty of his daguerreotypes, illustrating the great breadth of his photographic work. Together with their existing holdings (acquired form a descendent, the Comte de Simony, in 1950), this acquisition made it possible to assess the importance of his work with the daguerreotype, both quantitatively and qualitatively. In addition, in the summer of 2002, sixty-one daguerreotypes of views of Switzerland (Bern, Oberland, and the mountains) were discovered in the Musée Gruérien, in Bulle, Switzerland, which revealed new perspectivies on his work. In addition to significant holdings in private collections, a number of de Pragney's daguerreotypes are also housed in the Gernsheim Collection, University of Texas at Austin. Some of his later stereoscopic views are preserved at the Musée Nicéphore Niépce in Châlon-sur-Saône.

HELENE BOCARD

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DEANE, JAMES (1801–1858)

In the 1850s Dr James Deane MD of Greenfield, Massachusetts developed a procedure for photographing delicate trace fossils he had first observed in 1835 in sandstone slabs quarried in the Connecticut valley. Deane proposed that these "curious impressions" were the prints of extinct birds (later proved to be dinosaurs footprints). He sold casts and promoted his ideas to natural historians including Reverend Edward Hitchcock (1793–1864) the Professor at Amherst College Massachuisetts. Hitchcock went on to become a major authority in the field known as ichnology; a branch of paleontology concerned with animal and plant fossil traces. Deane later complained Hitchcock had taken his priority. From 1843 he published many articles in scientific journals but no books prior to his premature death in 1858. A an account of his 20 years of research titled *Ichnographs from the sandstone of Connecticut River* including 22 salt prints of his photographs, was published in Boston in 1861.

Deane was not the first to publish photographically illustrated scientific treatises, fossils photographs had been published in Europe and in America; Dr John C. Warren (1778–1856) founder of Harvard Medical school, used a salt print of a fossil slab taken by professional George Silisbee, as a frontispiece in his 1854 book *Remarks on Some Fossil Impressions in the Sandstone Rocks of Connecticut River.* Deane's work was also overshadowed by the massive tome published in 1858 by Hitchcock on the fossil prints. It was illustrated with seven albumen prints by a professional photographer, J. Lovell of Amherst. Supplements of Hitchcock's volume were published in 1863 and 1865, with dramatic irregular shaped photographs.

GAEL NEWTON

See also: Palaeontology; Books illustrated with photographs: 1840s; Books illustrated with photographs: 1850s; and Books illustrated with photographs: 1860s.

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DEGAS, EDGAR (1834–1917)

French painter, draftsman, pastellist, sculptor, and photographer

In the mid-1890s, after making the majority of his paintings and experimenting with pastel and monotype, Degas briefly focused on photography, producing a small body of fascinating pictures that were never exhibited during his lifetime. Unrecognized as part of his creative output and therefore excluded from the internationally renowned atelier sales of 1918 and 1919, much of Degas's photographic oeuvre may have been dispersed, discarded, or destroyed after his death. The majority of his surviving photographs are figure studies, self-portraits, and portraits of his intimate circle of friends—the poets Stéphane Mallarmé and Emile Verhaeren, the painter Auguste Renoir, Degas's brother René, and the Halévy family—in settings suggestive of realms more psychological than physical.

While its influence on his painting is a much debated topic, Degas was certainly aware of photography from the beginning of his career. He posed for carte-de-visite portraits, studied the stop-action photographs of Eadweard Muybridge in the late 1870s, bought photographic reproductions of other painters' work, and had photographs made of his own canvases. In 1885, a decade before he himself took up the camera, Degas set up an amusing tableau-vivant parody of Ingres's *Apotheosis of Homer* before the camera of a local photographer, Walter Barnes, in the seaside resort of Dieppe.

Not until the summer and fall of 1895, however, did Degas take up photography as part of his own artistic practice, embracing it with passion and enthusiasm. By then, the motifs in his paintings and pastels—dancers, women at their toilette, horses, and rare forays into landscape—were established, as were his untraditional viewpoints, lighting effects, and compositions. One might imagine that Degas would have adopted as his own the accidental cropping, instantaneity, casual compositions, and texture of modern life that were fast becoming common characteristics of amateur photography a half-dozen years after the introduction of the hand-held Kodak camera. In fact, however, the opposite was true. He worked in a far more deliberate fashion, using a larger tripod-mounted camera and 9 × 12 cm gelatin dry-plate negatives, and he carefully posed and lit his subjects for exposures that lasted two to three minutes. Just as he rejected the snapshooter's casual approach to the medium, he also eschewed the accepted standards of professional photographic practice, the decreed fashions of the portrait studio, and the aesthetics of the "Photo-Club" artist. Instead, as had been the case with paint, pastel, and sculpture, his unorthodox technique was driven exclusively by the effect he wished to achieve.

Letters written by Degas in August 1895 from the spa town of Mont-Dore to his photographic supplier and printer in Paris, Guillaume Tasset, reveal the intensity of his engagement with the mechanics and chemistry of the medium. On occasion, he developed and contact-printed his own negatives, and even when relying on Tasset and Tasset's daughter Delphine for photo-finishing and enlarging, Degas specified the cropping, tonality, and contrast of his prints. Despite the technical failures he encountered, Degas tried to make photography conform to his vision, for example asking Tasset for tips that would help him photograph close to nightfall. "Daylight gives me no problem," he declared. "What I want is difficult—the atmosphere of lamps and moonlight." With his eyesight gradually failing and the precious daylight hours reserved for working on pastels and sculptures, Degas preferred to photograph in the evening, when he could impose greater control over the lighting. Throughout the autumn and winter of 1895, Degas dined frequently at the home of his close friends Ludovic and Louise Halévy and their sons Elie and Daniel. Many such evenings concluded with long photographic sessions, vividly described in Daniel Halévy's journal: "Degas raised his voice, became dictatorial, gave orders that a lamp be brought into the little parlor and that anyone who wasn't going to pose should leave….These days, all his friends speak of him with terror. If you invite him for the evening you know what to expect: two hours of military obedience." The photographs made on those remarkable evenings and preserved by the Halévy family and their descendants now constitute the bulk of Degas's known work in the medium.

Degas found a powerful spiritual content in photographs, independent of artistic intention or appreciation, and his activity in the medium seems closely related

to his profound melancholy. In a desperate attempt to bring back before his eyes his dying sister Marguerite, who had moved hastily to Buenos Aires a half-dozen years earlier, he shipped a camera and supplies to her in August 1895 and beseeched her to send photographs of herself, her family, and their home. Her death in October, just two years after that of their brother Achille, deeply affected Degas. Photography provided him with an activity that bound him to a surrogate family—the Halévys—in a situation he could control, especially during the evening hours when his mind would otherwise have dwelled on the death and dispersal of his own family. Degas's most psychologically expressive portraits, in which figures emerge from lugubrious surroundings, are the product of this mournful period.

Among the most intriguing aspects of Degas's work are those few instances in which his strikingly idiosyncratic photographs informed his paintings and pastels of the 1890s. The Getty Museum's *Nude Drying Herself*, an extraordinary image of a nude model leaning on the back of a chaise longue and twisting her body, served as the basis for one of Degas's major late canvases, the Philadelphia Museum's *After the Bath* (1896), and for several smaller studies in pastel and charcoal. Equally without parallel are three glass negatives that show a dancer in various poses; these, too, served as direct models for dozens of drawings and pastels in the late 1890s, and for one of Degas's small statuettes. Their extraordinary appeal lies in their unusual appearance—shades of orange and red, with some portions reading as negative and others as positive—and in their treatment of a central theme of his art with a formal structure, grace, and intimacy that are uniquely his.

Only a single photograph, a portrait of eight- or nine-year-old Claudie Léouzon le Duc, is documented as having been made after Degas's burst of activity in 1895. That this portrait was made in 1901 suggests that he continued to use his camera from time to time, even as his eyesight and enthusiasm waned. Degas's photographic equipment remained in his studio at the time of his death in 1917.

Four photographs by Degas—two landscapes and two negative-print copies of his paintings—were included in the 1936 retrospective exhibition at the Pennsylvania (now Phhiladelphia) Museum of Art, but his work in the medium was otherwise relegated to illustrational purposes until the 1980s, when it was included in two major monographic surveys: "Degas: Form and Space" at the Centre Culturel du Marais, Paris, in 1984, and "Degas" at the Galeries Nationales du Grand Palais, Paris, the National Gallery of Canada, Ottawa, and The Metropolitan Museum of Art, New York, in 1988. Degas's photographs were the subject of a focused exhibition, "Edgar Degas, Photographer," at The Metropolitan Museum of Art, New York, in 1998 and the Bibliothèque nationale de France, Paris, in 1999, accompanied by a catalogue raisonné of the same title.

Major holdings of Degas photographs are found at the Musée d'Orsay, Paris, including many negatives and prints from the Halévy family; and at the Bibliothèque nationale de France, Paris, where Degas's brother René deposited archival material from the painter's studio in 1920. Other public institutions possessing photographs by Degas are: The J. Paul Getty Museum, Los Angeles; The Metropolitan Museum of Art, New York; The Museum of Modern Art, New York; The Fogg Art Museum, Cambridge, Mass.; the Musée départemental Stéphane Mallarmé, Vulaines-sur-Seine; the Bibliothèque littéraire Jacques Doucet, Paris; The Sterling and Francine Clark Art Institute, Williamstown, Mass.; The Achenbach Foundation for Graphic Arts, San Francisco; and George Eastman House, Rochester.

MALCOLM DANIEL

Biography

Hilaire Germain Edgar De Gas was born July 19, 1834, the eldest son of banker Auguste De Gas and his wife Celestine née Musson. He entered the studio of Louis Lamothe, a pupil of Ingres, in 1854; attended the Ecole des Beaux-Arts in 1855–56; and traveled to Italy 1856–59 to draw, paint, and copy the Old Masters. He was a founding member of the Impressionist group in 1874, and exhibited in seven of the eight Impressionist exhibitions during the next dozen years, although his subjects, style, and technique were at odds with the *plein air* painters who constituted the majority of the group. Degas briefly experimented with photography late in his career, principally in the summer and fall of 1895. He died in Paris, September 27, 1917.

See also: Kodak.

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DELABORDE, HENRI (1811–1899)

French photographer

Delaborde was born in a wealthy family, which gave him the title of count. He studied human sciences at the university. His parents hoped their son would work as lawyer, but he ended up in the artistic sector.

He met Paul Delaroche in 1829, and spent a lot of time in his studio to study classicism. During the years 1834, 1839n and from 1842 until 1845, he travelled to Italy. He made these trips to enrich his knowledge. Yet, he didn't participate in the Prix de Rome. During these years he studied the paintings of the Renaissance and made drawings and aquarelles. It was his intention to print and to publish all his work. Some unhappy events occurred in his life, so only the first publication from the series was realized.

In 1836, when he was 25 years old, he had his first show in Le Salon with a painting *Agar dans le desert*. In the painting one can see the influence of his master Delaroche but also his admiration and adoration for Ingres and for the Italian Masters of the Renaissance and especially for Raphaël. Delaborde offered this painting to the Musée de Dijon after an exhibition there in 1840.

Delaborde had several distinctions and the French State gave him many commitments. Quite often, he participated at shows in Le Salon. In 1850 he became ill and the physicians forbid him to remain in a standing position.

So he had to quit painting and his friends encouraged him to start a career as an art critic. This was something new in the art world. The work of an art critic was connected with writers. It was a progressive statement as a former artist to work as a writer in the field of art. He did this until the end of his life. His critics still consider his writings as important because of his audacity, firmness and acuteness. He published mostly in *Revue des deux mondes* in which Delacroix also contributed.

Delabordes' passion went out to gravures and that was the basis of a 30 yearlong job as Chief Conservator of the Cabinet des Estampes in the Bibliothèque Nationale in Paris. He was responsible for the purchase of lots of photographic art reproductions as reference material. This position and involvement in the archives gave him also the challenge to work as art historian. Topics he studied were Italian Art and especially from Giotto to Perugino. He became the reference as a historian in the world of gravures and lithography. Even today his work on Marc-Antoine Raimondi is remarkable. He defined art criticism as a judgment that presupposes interpretation, and interpretation presupposes description. The critic needed an understanding—hopefully a defensible and convincing understanding—of what an art work is about before judging it. He explained that criticism was too frequently confused with negative value judgments because of its everyday connotations. The term criticism in the language of aesthetics encompasses much more. He wrote that the purpose of the aesthetics of art history and art in general is to teach how to judge and to appreciate art works and to provide a context for expressing this judgment verbally on the basis of a sound argumentation. So he did. In 1866 his most important writings were published in *Mélanges sur l'art contemporain*. In 1868 he became secretary of the Academy of Science and Art in Paris and kept this position for 24 years. His writings are an enormous source for academic research of the history of art in the 19th century.

In 1898 he ended his activities; he died when he was 88 years old in 1899.

JOHAN SWINNEN

See also: France; Delaroche, Paul; Delacroix, Ferdinand Victor Eugène; and Criticism.

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DELACROIX, FERDINAND VICTOR EUGÈNE (1798–1863)

French painter

Ferdinand Victor Eugène Delacroix, the most important French romantic painter, was born in 26 April 1798 at Charenton Saint-Maurice in the Val-de-Marne. His father was minister of Foreign Affairs, under Le Directoire. His early education was at the Lycée Louis Le Grand. In 1815 he began his training with Pierre-Narcisse Guérin in the neoclassical style of Jacques-Louis David, but he was strongly influenced by the more colorful and rich style of the Flemish painter P.P. Rubens and fellow French artist Théodore Géricault. He showed his particular talent already in 1822, with its colored "Dante and virgil crossing the lake which surrounds the infernal city of Dité" which caused a scandal.

In 1824, he was obviously inspired by paintings of John Constable, which were exhibited in Paris. He stayed several months in the United Kingdom, where he came influenced of the poet Lord Byron and once again of the lively and clear colors in the landscapes of Constable. Meanwhile an inheritance of ten thousand pounds gave him the freedom to concentrate on his art. He put impressive historical shows on canvas and in 1831, he exposed on the fair are famous "Freedom runs into the people." In 1832 he traveled to Spain and North Africa, a trip that would influence the subject matter of a great many of his future paintings. Between 1833 and 1847 he had assignments in the Salon du Roi en de libraries of Palais Bourbon and the Palais de Luxembourg.

In the last ten years of his life he realized important decorative ensembles: the central ceiling of Apollon-galery in the Louvre, the Salon de la Paix in City Hall in Paris and the Saint-Agnes Chapelle of the Saint-Sulpice-Church.

From 1851 Delacroix was a member of the group of artists and writers who went on to form the Société héliographique. He used photography to make artists' studies for use in future paintings. He worked with Eugène Durieu who made graphic prints as well as photographs. Delacroix took photographs during his holidays in Dieppe. On 10 January 1857 he was incorporated in the Institut of the Academicians, taking the place of Delaroche. Delacroix triumphed in 1855 at the Exposition Universelle in Paris with showing 42 paintings. In the period 1856–1863 he is accepted as member of the Société française de photographie in which he became very active. He endeavoured to give photography proof of his esteem in attaching himself, among other things, in 1859, to a group of seven artists, members of a committee wanting to include photography in the Paris Salon. They succeed. Delacroix was one of the painters who, with Francis Wey and Le Gray, help the photographers to find their own terminology. Beside his work as painter, Delacroix worked also as an illustrator of books of William Shakespeare, the Scottish writer Sir Walter Scott and the German writer Goethe.

Delacroix has had much influence on others, especially by his expressive use of color. He died on 13 August 1863 in Paris.

JOHAN SWINNEN

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DELAGRANGE, BARON ALEXIS (1825–1917)

French photographer and landowner

Alexis Delagrange was born into an ancient and noble family in Douai on 4 April 1825. His father, Baron Prosper-Amauri-Louis, was a colonel in the army and an officer of the Legion of Honor. Alexis attended the Ecole Polytechnique in Paris and upon graduation served in the naval artillery from 1844 to 1847.

In 1849, equipped with a camera, he departed for a two-year trip to India accompanied by his older cousin, the statesman Felix Lambrecht (1819–1871). Theirs was an unusual itinerary since, unlike Egypt or Palestine, India was not part of the "Grand Tour" undertaken by wealthy young Frenchmen of the time. In addition, they traveled primarily in the northern interior part of the country, stopping at only one of the few, small French colonies still in existence along the coast. Their trip is also unusual in that travel photography was in its infancy and Delagrange was among its first European practitioners in India, anticipating the British government-funded photographic surveys beginning the mid-1850s along with the inauguration of the field of Indian architectural history.

Despite the pioneering nature of his work Delagrange

envisioned his trip as being solely for his own amusement. In this he differed radically from his ambitious contemporary Maxime Du Camp whose travels in Egypt and the Near East during the same period resulted in the publication of the first major travel album of its kind. Delagrange and Lambrecht did indeed amuse themselves. According to the latter's *Souvenirs* (1873), the two young men socialized with the British residents, hiked in the Himalayas for several months, and took great pleasure in hunting tigers and elephants in other regions particularly renowned for such sport. No photographs by Delagrange exist to document these aspects of their trip. Perhaps due to unfavorable weather conditions and technical limitations, there is not a single landscape of the Himalayas such as those by Samuel Bourne taken in the 1860s. Less explicable is the absence of any pictures of hunters posed around their dead prey, a theme that became a staple for British 19th-century tourists.

Returning to France in 1851 Delagrange assembled two leather-bound photographic albums of Indian architecture both titled "Photographies de l'Inde Anglais" [Photographs of British India]. One, dedicated to the statesman Adolphe Thiers, contains 61 albumen prints, each circa 17 by 21 cm, accompanied by Delagrange's extensive handwritten notations. The other is captioned but without a dedication or annotations. It contains 48 albumen prints, all but two identical to those in the Thiers album. Five of these prints, two co-signed by Lambrecht, appeared in an album assembled by Victor Regnault in 1851. Another five were included in Blanquart-Evrard's first publication, *L'Album photographique de l'artist et de l'amateur* [The Photographic Album of the Artist and the Amateur] (1851).

From the existing prints that are known to be by Delagrange it would appear that he took only 63 photographs during his two-year trip, although it is likely that he exposed a few negatives during his short stay in Egypt before arriving in India, even if only as a demonstration for Du Camp to whom he taught the wet waxed paper negative process by Blanquart-Evrard that they both used throughout their travels. Also missing are any photographs that Delagrange may have taken during his first four months in India and the last seven months of his trip in Cylon, Java, Malaysia, and Singapore.

There is no indication that Delagrange assembled other albums, or exhibited his pictures, or took up the camera again after 1851. For the remainder of his life he turned most of his attention to the administration of his considerable fortune. In 1870, however, dismayed by the uprisings of the common people during the Commune, he entered into politics, eventually becoming a right-wing member of the senate. He left public service in 1881, retiring to his chateau at Sebourg where he died 11 February 1917.

All of Delagrange's known photographs depict architectural monuments and urban views, the one exception being a portrait of an Indian servant that opens the Thiers album. Within this circumscribed range Delagrange's choices were eclectic. Not surprisingly, he took pictures of some of the most famous monuments (three of the Grand Mosque at Delhi and six of the Taj Mahal) but he also photographed lesser known tombs and temples, including a general view of a Muslim cemetery. Along with pictures of famous palaces are those of private residences, such as the home of an Indian banker and a British neo-classical bungalow.

Delagrange's admiration for Indian architecture is clearly expressed in words, shining through the dry technical data that characterizes his running commentary on the photographs. He frequently noted the decaying conditions of the monuments he depicted and his criticisms of their materials and faulty construction indicate his schooling as an engineer, yet he avoided a display of these elements of disintegration in the actual photographs. This selectivity, along with his straightforward, centered compositions produces an overall impression of grandeur and stability. In this regard Delagrange differs from Linnaeus Tripe, for example, whose focus in the mid-1850s was primarily on princely palaces, seeing them, in both image and text, as the ruins of a former political order. In general, Delagrange's photographic choices are indicative of those of a tourist without a specific agenda, imperial or otherwise.

Delagrange's photographic oeuvre was rarely noted publicly by his contemporaries, and then only summarily, receiving little attention until the turn of the 21st century when the unusual nature of his accomplishment began to be recognized. One album entered into the public domain in the collection of the Canadian Center for Architecture in Montreal. This acquisition and its subsequent exhibition stimulated an interest in Delagrange prompting a closer look at his annotated album in the Bibliothèque Thiers in Paris and at the 36 salted paper prints at the Musée d'Orsay, also in Paris. In addition to these institutional holdings there are a scattering of Delagrange prints in private collections.

JULIA BALLERINI

Biography

Alexis Delagrange was born into a noble family in Douai on 4 April 1825. In 1849, equipped with a camera, he departed for a two-year trip to India, Cylon, Java, Malaysia, and Singapore accompanied by his older cousin, the statesman Felix Lambrecht (1819-1871). Returning to France in 1851 he assembled two photographic albums of Indian architecture, one whose intended recipient is unknown and the other dedicated to the statesman Adolphe Thiers. Although he was one of the first Europeans to photograph Indian monuments,

there is no indication that he produced other albums, exhibited his pictures, or took up the camera again after 1851. A few of his prints appear in an album assembled by Victor Regnault and in another published by Blanquart-Evrard. Apart from a brief political career in the 1870s, Delagrange devoted most of his life to managing his considerable fortune. He died in his chateau at Sebourg 11 February 1917.

See also: Survey photography; Tripe, Linnaeus; and Blanquart-Evrard, Louis-Désiré.

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DELAMOTTE, PHILIP HENRY (1820–1889)

British photographer, author, and teacher

One photographic commission dominates the career of Philip Henry Delamotte—the photography of the dismantling of the Crystal Palace in Hyde Park after the Great Exhibition of 1851, and its rebuilding on a new site at Sydenham, Kent, England.

The decision to engage a photographer to record the progress of the project initiated one of the first major industrial photography commissions in Britain. The resulting body of work is tangible evidence of the heightening of photography's profile immediately following the Great Exhibition itself, and certainly since the original construction of Joseph Paxton's masterpiece in Hyde Park. While there was little enthusiasm for photography during the original construction, the rebuilding, opening, and contents of the Sydenham Crystal Palace were all covered by a number of photographers, and commercially exploited by Negretti and Zambra and others.

By the time of the Crystal Palace commission, Delamotte was already an accomplished photographer, having been introduced to the calotype process in the late 1840s. By the early 1850s he was advertising his services both as a photographic printer and as a portrait photographer, claiming in 1853 to have made arrangements with William Henry Fox Talbot—described as "the Patentee"—to practise Scott Archer's newly discovered wet collodion process. Many photographers at that time agreed to acknowledge Talbot's claimed patent interests in all negative/positive processes rather than risk litigation, until a later court case clarified the matter.

Through both his early contact with the calotype process and his associations with the art world, he became acquainted with Roger Fenton, Francis Bedford and photographer/publisher Joseph Cundall, and through a shared interest in antiquity, he became a friend of Dr Hugh Welch Diamond. Many of these early associations and friendships would result in collaborations later in his career.

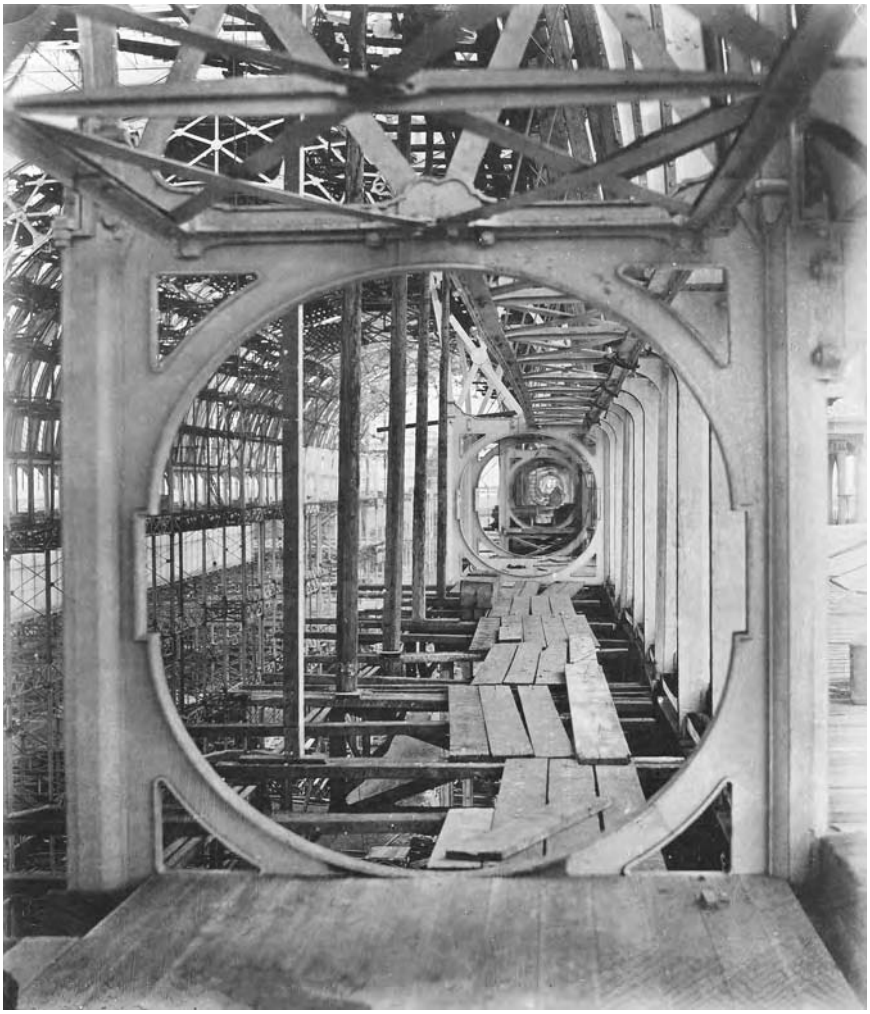
Delamotte was the son of the landscape painter and lithographer William De La Motte, and during his career adopted two alternative styles for his name. As an artist and an engraver, in his first two publications *On the Various Applications of Anastatic Printing and Papyrography* (1849) and *Choice Examples of Art Workmanship Selected from the Exhibition of Ancient and Mediaeval Art at the Society of Arts* (1853) he styled himself Philip DelaMotte. However, for the first edition of his book *The Practice of Photography; a Manual for Students and Amateurs*, also published in 1853, he used the style Delamotte, under which name all his subsequent work seems to have been published. That volume drew on his friendships with fellow photographers, including details of processes used by Talbot, le Gray, Cundall, Diamond and others.

The earliest recorded account of the publication of any of his photographs comes in an 1852 review in *The Atheneum* of two of his images in parts I and II of *The Photographic Album*.

That he was already an accomplished photographer and recognised authority on photographic processes is evidenced by the 1853 publication of *The Practice of Photography*—which would subsequently run to three editions. Curiously, that volume proclaims that it contains "a calotype portrait taken by the collodion process"!

When the British Museum was seeking in 1853 to establish a "photographic room"—which would later lead to the appointment of Roger Fenton as Museum Photographer—it was to Delamotte that the trustees initially turned for advice on the construction and equipping of the facility.

The publication of *Photographic Views of the Progress of the Crystal Palace, Sydenham* in London in 1855 was Delamotte's third publication on the subject, but his first to be illustrated with original photographs rather than his drawings, or engravings derived from his photographs. In all 160 images were published in the



Delamotte, Philip Henry. The Upper Gallery.
The Metropolitan Museum of Art, David Hunter McAlpin Fund, 1952 (52.639.34) Image © The Metropolitan Museum of Art.

two volumes, and as was typical of such publications at the time, there were alternative versions of several of the images. This led to differences between one published set and another, depending on which collodion negatives had been used to make the prints. The importance of the albums in raising architectural photography well above straightforward representation has subsequently been recognised, and the legacy of Delamotte's achievement can be traced through the work of many other photographers. His images, celebrating the interaction of light with the dynamic geometry of the Palace's construction, stand as an eloquent tribute both to Paxton's original concept, and to Victorian engineering.

Delamotte was one of a number of photographers who became increasing concerned about the possibility of impermanence in their photography. Along with Roger Fenton and others, he was a member of a committee formed in 1855 to investigate the problem. After some deliberations, the "First Report of the Committee Appointed to take into Consideration the Question of the Fading of Positive Photographic Pictures Upon Paper" appeared in the *Journal of the Photographic Society* and was reprinted in the *Photographic Fine Art Journal* in January 1856. Given the proven durability of the work of both Fenton and Delamotte in the 150 years which have followed, their concerns were perhaps overstated. Delamotte's 1856 booklet *The Oxymel Process in Photography* included a chapter of advice on the preservation of photographic prints, drawn directly from this work.

In 1857 he became the founder editor of *The Sunbeam*, a photographic magazine published by Chapman and Hall, each issue containing four original photographic prints. The first part contained images by Delamotte himself, John Dillwyn Llewellyn, Sir Jocelyn Coghill, and Francis Bedford, and was well reviewed in *The Atheneum* in February 1857. Six issues were published, followed by a bound volume in 1859, entitled *The Sunbeam: A Book of Photographs from Nature,* containing work by Bedford, Cundall, Delamotte, F.R. Pickersgill and others.

In 1855, and alongside his growing workload as a photographer, Delamotte accepted the post of Professor of Drawing at King's College London, a post he held

for over 30 years. In addition, he offered his services as an occasional instructor at the Photographic Institution in New Bond Street.

He continued to publish extensively, working sometimes alone, and sometimes with Cundall. Together they illustrated *A Photographic Tour Among the Abbeys of Yorkshire* published by Bell and Dalby in London in 1856.

The majority of his publications after 1855, however, were concerned with drawing, glass painting, engraving and with illustrating art history.

Many of his early photographically illustrated books are held in the British Library.

JOHN HANNAVY

Biography

Philip Henry Delamotte was born in London in 1820, the son of the painter and William de la Motte, then the drawing master at the military academy at Sandhurst. He also studied art and was an accomplished and published lithographer by the age of 30. Taking up photography in the late 1840s, he experimented first with the calotype and waxed paper processes before turning to wet collodion for his photography of the Crystal Palace. His manual *The Practice of Photography* was published in 1853, and a pamphlet *The Oxymel Process in Photography* followed three years later. He was Professor of Drawing and Perspective at King's College, and King's College School, London, a post he held from 1855 until 1887. His book *The Art of Sketching from Nature* was published by Bell and Dalby in 1871. Although he continued to exhibit photographs, after 1859 his publications were all concerned with drawing except the two-volume *Holland House* by Princess Marie Lichtenstein in 1874, for the special edition of which he produced 37 Woodburytypes. Delamotte died in 1889.

See also: Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); Calotype and Talbotype; Wet Collodion Positive Processes; Cundall, Joseph; Fenton, Roger; Bedford, Francis; Talbot, William Henry Fox; le Gray, Gustave; and Diamond, Hugh Welch.

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DELAROCHE, HIPPOLYTE (PAUL) (1797–1856)

French painter

Delaroche was born in Paris on 17 July 1797, the second son of parents who were well connected in artistic circles. His father Grégoire-Hippolyte was a picture-dealer and collector who held an official position at the Mont de Piété, the state pawnbroking institution. Through his mother, Marie-Cathérine Bégat, he was related to Adrien-Jacques Joly, the curator of the Print department of the Bibliothèque Nationale. Both he and his elder brother, Jules-Hippolyte (1795–1849) were directed to an artistic career by their father. However the privilege of training in the more prestigious genre of history painting went to Jules, who entered the studio of Antoine-Jean Gros in 1816. Paul (so called from his childhood onwards) was placed in the studio of Louis Watelet to train as a landscape painter, and classed fifth in the first Prix de Rome for historical landscape in 1818. It soon appeared that he was more talented than his brother, but not in the domain of landscape. He transferred to Gros's studio, and rapidly made his mark among a group of peers which included the English painter Richard Parkes Bonington and the pioneering lithographer, Nicolas-Toussaint Charlet.

Delaroche's first showing at the Paris Salon was in 1822, where he gained the approval of the dying Théodore Géricault for his *Joas sauvé*. He achieved wide-spread recognition for his *Joan of Arc* at the 1824 Salon, with Stendhal predicting that he would soon make his reputation. A visit to England in 1827 helped him to improve his knowledge of the visual sources for British history, which was in vogue in Paris at the time, as a result of the popularity of Walter Scott's novels. A direct outcome was his *Death of Elizabeth* (1828), showing the dying English Queen attended by her courtiers. After the elder branch of the Bourbons had been expelled in the July Revolution of 1830, Delaroche distinguished himself with two major examples of historical genre for the 1831 Salon. His *Princes in the Tower* drew on English illustrations to Shakespeare's *Richard III*, and his *Cromwell and Charles I* used Chateaubriand's account of the English Civil war to present a pictorial meditation on the morality of revolutions. The critic Horace de Viel-Castel wrote of visitors pausing 'for whole hours' before the spectacle of the decapitated king.

Delaroche's prominence among the Romantic generation of French artists received official recognition when he was elected to the Académie des Beaux-Arts in 1832, at the ununusually early age of 35. In 1833, he accepted the post of Professor at the Ecole des Beaux-Arts, and began to direct one of the most successful studios in Paris. Together with Horace Vernet, who

became his father-in-law, he represented the liberal vanguard within the Academy, pressing unsuccessfully for a reform of the jury system which was preventing talented younger artists from showing at the Salon. His most substantial work of the decade, completed in 1841, was the huge semi-circular *Hémicycle des Beaux-Arts*, erected in the official amphitheatre of the school, which offered a colourful pageant of 'artists of all ages' from the Ancient Greeks to Nicolas Poussin. The format of this work, which spread his reputation throughout Europe, compares with the spectacular panoramas then popular in Paris.

Delaroche's name has entered the mythology, if not the history, of early photography as a result of an apocryphal remark, supposedly made on seeing his first daguerreotype: 'From this day painting is dead!' ('La peinture est morte, à dater de ce jour!) No earlier source for this anecdote can be found than the tendentious *Les Merveilles de la photographie*, first published by Gaston Tissandier in 1873. It is, however, certain that Delaroche was asked by François Arago to provide a brief report on the artistic potentiality of Daguerre's invention for the decisive meeting of the Academies of Sciences and Fine Arts on 19 August 1839. Arago quoted from this report at the meeting, and Delaroche's manuscript, which contains significant additional material, is preserved in the Cromer Collection (George Eastman House). The notion that Delaroche chose this occasion to make the attributed remark (repeated by Helmut Gernsheim and others) is inherently improbable. What cannot be challenged is Delaroche's affirmation, quoted by Arago, that the daguerreotype would aid the education of painters by providing unequalled studies of the 'distribution of light.'

In effect Delaroche was familiar with Daguerre's work long before August 1839. In a speech to the Academy of Sciences on 7 January 1839, the astronomer Jean-Baptiste Biot spoke of visiting Daguerre's 'new gallery of light drawings (*dessins de lumière*)' in company with Delaroche.In a subsequent letter to Willaim Henry Fox Talbot, Biot revealed that Horace Vernet and Louis Hersent, then Vice-President of the Academy of Fine Arts, were also present. A painting by Prosper Lafaye (*Conférence dans le salon de M. Irisson,* Musée Carnavalet) portrays both Delaroche and Vernet giving a 'lecture on the discovery of photography' in a private house in Paris. This suggests that, quite early in 1839, Delaroche and his father-in-law were playing a role in facilitating the understanding of the new medium.

Unlike Horace Vernet, Delaroche seems not to have practised photography, nor indeed to have been photographed. Yet it is no accident that several major French photographers of the next generation, such as Gustave Le Gray and Henri Le Secq, were originally his students. Delaroche was identified more than any other painter with the public announcement of the invention of the daguerreotype, and the attempt to justify its utility for artists. It can also be held that he came to understand some of the wider historical and cultural implications of photography. Several paintings produced shortly before his death in 1856 indicate close study of light effects produced from a small aperture in a darkened chamber, and one shows Saint Veronica prostrate before the imprint of Christ's face, which radiates light.

Delaroche's privileged connection with photography did not end with his death. As a result of the initiative of his print editor, Adolphe Goupil, the English-born photographer Robert Jefferson Bingham was entrusted with the task of recording his life's work, much of which was on view at a posthumous exhibition in 1857. The *Oeuvre de Paul Delaroche*, published in 1858, was the first *catalogue raisonnné* to be fully illustrated by photographs.

STEPHEN BANN

Biography

Paul Delaroche was born on 17 July 1797 in Paris. Brought up by parents who were closely engaged in the world of the visual arts, he nurtured an early ambition to be a painter, and studied first of all with the landscape painter Louis Watelet and secondly with the history painter, Antoine Gros. His exhibition of paintings at the Paris Salon, between 1822 to 1834, did much to popularise the new category of 'historical genre,' in which the subject matter was taken from medieval and early modern history. He was elected to the Académie des Beaux-Arts in 1832, and became Professor at the Ecole des Beaux-Arts in 1833. Among the pupils in his studio, which was open until 1843, were several major French photographers of the next generation. In 1839, he provided a favourable report on the relevance of the daguerreotype to artists, which was utilised by Louis Arago. After the death of his wife in 1845, he retired from public life, and spent much of his time in his studio in Nice, working on paintings with religious themes. He died in Paris on 4 November 1856.

See also: Bibliothèque Nationale; Daguerreotype; Tissandier, Gaston; Talbot, Willaim Henry Fox; Le Gray; Gustave; and Le Secq, Henri.

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DELESSERT, BENJAMIN FRANÇOIS MARIE (1817–1868) AND ALEXANDRE HENRI EDOUARD (1828–1898)

French photographers, writers, and businessmen

Two cousins, members of an influential family of bankers, politicians, civil servants, and philanthropists, Benjamin and Edouard Delessert studied photography with Gustave Le Gray. Both exhibited at the *Exposition universelle* in 1855.

In 1853–1854, Goupil and Colnaghi co-published Benjamin's *Notice sur la vie de Marc Antoine Raimondi* (67 salt paper prints from paper negatives, mounted on 59 plates). This was among the first significant uses of photography for art history. Delessert selected the best Raimondi prints he could find in public and private collections, photographed them, and contributed an essay. His scientific ambition manifested itself in the size of the photographs, which replicated the size of the originals. Goupil reprinted copies of the photographs in 1864. Benjamin was a founding member of the *Société française de photographie* (SFP).

A nephew of Léon de Laborde and a friend of Olympe Aguado (with whom he made several portraits), Edouard Delessert traveled to Sardinia in 1854 and there photographed architectures and landscapes. Goupil published 40 of these pictures. Involved in the beginnings of the SFP, Edouard left quickly in disagreement but re-enlisted in 1859. In 1861 and 1863, he exhibited at the *Société* the dramatic enlargements he obtained with a device of his own called a *porte-lumière*.

Pierre-Lin Renié

DEMACHY, (LEON) ROBERT (1859–1936)

French photographer

(Leon) Robert Demachy was active from the late 1870s until 1914; he was one of the best known and most influential photographers of those times. He was one of the most important European pictorialist photographers known by the use of new techniques and for his artistic skills.

Robert Demachy was born in Saint-German en Laye the 7th. July 1859, he was the youngest child of a wealthy bankers family, and, like many amateur photographer of its time, was able to lead his life and art without any major financial problems. His childhood was marked by his family's stay in Brussels, during the Franco-Prussian war. This fact allowed Demachy to concentrate on his art, as he never showed ability to the family's banking activity.

His friends were to be found among the artists, the bohemian Paris cafes were his favourite spot.

In 1893 he married Julia Adelia Delano, an American he had met at the 1889 Universal Exhibition; it was not a happy marriage, as both were too independent. Robert Demachy hated the high society life that Julia Adelia valued. The couple divorced in 1909.

He died the December 29th, 1936, and was buried in the Père Lachaise cemetery, like many of the most illustrious Frenchman.

Maybe he got the passion for photography by influence of his painter friends, all we know is that he started photographing, using the wet collodiom process, during the 1870s. However, it was in the early 1880s that his work started being known and recognized.

In 1882 he was elected to the *Societè francaise de photographie*, he was also a member of Royal Photographic Society, Linked Ring and Photo Secession. Soon he became the undisputed leader of French, and even of European, pictorialist photography.

At the time there was a strong opposition between pictorialist and naturalist photography and he attacked naturalist photography's main ideologist, Peter Henry Emerson, accusing him of artistic contradictions and falsities.

His English language skills helped him to a series of contribution to the British and American photographic press including the *British Journal of Photography* and *Camera Work*, in addition to many writings he published in French magazines. In an article published in 1898 in the *Paris Photo-Club* magazine he asks whether photography can be considered as an art. A rhetorical question, of course, as he had the answer, and in words, as well as in pictures he tried to prove photography was, indeed an art form. In a *Camera Notes* 1899 article he would question the difference between a good photograph and an artistic photograph. As for other pictorialist photographers the print was the key to artistic photography.

His exhibited work had great success, since the Exposition Universelle, Paris 1889, where he won a bronze medal. He was to participate in several exhibitions, not only in France, but also in Belgium, Germany, Great Britain, Italy, Switzerland and United States, where he was a participant in the Photo Secession exhibition in Philadelphia, and at the New York Little Galleries Exhibition in 1906. He was one of the few photographers of his time to have their own personal exhibitions, some were held in his personal studio, but others crossed the channel and were held in the Royal Photographic Society (1901, 1904, 1907).

His technique, the use of new processes and his themes, along with his artist mastery were the keys to his success. The search for new processes was one of the pictorialists' main reasons of being, they tried to produce photographs closer to other art forms, and the "conventional" photographic processes were unfit to this role. Pictorialists were searching for the individual-

ity not possible with mass produced materials entering photography since the 1880s. They were part of late 19th Century individualist reaction to industrial society. Demachy one of the first to use gum printing, he was also a pioneer of bromoil printing. He was not only a user of these processes, but one of their most prominent advocates, writing about their practice. Gum printing allowed the photographer to have a hand in manipulation and in the choice of textures, colours, and papers closer to what was possible to painters or etchers. These printing processes were no more than a means to his idea of an interpretative photography, the only one where the photographer could put his creativity to work, thus creating an art piece, not only a mere reproduction of a scene, they were in the heart of pictorialist photography theory and practice. The use of these processes led to the critics and public acclaim of Demachy's work, however there were also negative reactions. Naturalist photographer P. H. Emerson was a critical voice, considering Demachy's work theatrical and ill composed. Others had a less critical point of view, but regretted the overstatement.

He was an adept user of the telephoto lens, and also wrote about it. This lens would allow him to get a smaller depth of field, desirable to his interpretative photograph.

The female nude and the landscape, especially when including water, account for some of his best known photographs. Many photographers, up to the late 20th century, tried to imitate him, even in his fondness for photographing very young girls. Some of the work inspired by Demachy had, even during his time, considerable success, however in most instances the imitation often lacked Demachy´s artistic quality. Using children and prepubescent girls in his nude photographs was not an attempt to make them erotic, but was instead an attempt to lower his erotic intensity, and the use of unconventional forms of printing like gum and bromoil, increased this effect. He made other photographs with oriental themes, urban scenes, especially when showing the kind of picturesque quality found in northern France, or the atmospheric effects prized by pictorialists. He was also an adept of speed as theme for photography, one of the most important fads of early 1900's photos. Speed was a major concern for all society, and for photographer was a means of showing great skills. Less known are his folk costume pictures.

Fog in the river, the raging sea, little dressed girls in a pseudo oriental scene are among the most popular 1900 pictures, they were made over and over again, but their popularity owes mostly to Robert Demachy who made them first, and in an such an outstanding way, that inspired admirers and imitators for over half a century.

With his fellow Frenchman Constant Puyo and American Alfred Steiglitz he is considered one of the great masters of pictorialist photography, however, unlike Stieglitz he did not create an organized movement.

In 1914 the First World War was beginning; the artistic movements, born in the late 19th century, were coming to an end. Photography was to go through major changes: the Linked Ring was dissolved in 1910; the Photo-Secession would survive a few years more, but Camera-Work would be the first magazine to show new, opposed to pictorialism, approaches to photography.

Robert Demachy stopped photographing in 1914; it is not possible to say whether he was aware of the changes going on photography. He reportedly never touched a camera again. In 1931 his friend Puyo organized a retrospective exhibition of his work. He gave part of his collection, which included work by himself and other photographers, to the Royal Photographic Society, another part to the Paris Photo-Club.

Nuno de Avelar Pinheiro

See also: Expositions Universelle, Paris (1854, 1855, 1867 etc.); Wet Collodion Positive Processes; Royal Geographical Society; Brotherhood of the Linked Ring; Gum Print; Stieglitz, Alfred; and Pictorialism.

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DEMENŸ, GEORGES EMILE JOSEPH (1850–1917)

French born inventor, chronophotographer, film maker, and physical education instructor

Born at Douai, France, 11 June 1850, Georges Demenÿ's mother's name was Adéle (née de Vignron); his father Philippe Joseph Demenÿ was a musician. Georges studied at Douai and Lille, then in Paris with physiologist Etienne-Jules Marey. From 1882 Demenÿ worked as Marey's assistant at the Station Physiologique, photographing sequences of animal and human movement, from 1888 on strips of paper and later on celluloid. In 1892 Demeny patented the Phonoscope, for direct viewing or projection of a short sequence of such photographs mounted around a disc.

Demenÿ broke away from Marey, in order to commercialise his invention. He designed the important 'beater movement' camera, and produced charming

Phonoscope scenes, including Danseuse de French-Cancan, Premiere pas de bébé, and Passage du train.

Following a contract with Leon Gaumont, the Phonoscope disc viewer / projector (renamed Bioscope) was offered for sale late 1895, and early 1896 the Biographe camera using 60mm unperforated film. The disc machine gave only very brief projections, and failed commercially, being immediately superseded by film projectors. However, Gaumont successfully exploited the 'beater' mechanism in later machines, and Demenÿ returned to his first interest, gymnastics instruction. He died in Paris on 26 December 1917.

STEPHEN HERBERT

DENIER, HENRY (ANDREJ IVANOVITCH) (1820–1892)

Professional photographer

A. Denier was born in Mahilyow in 1820 in the family of Swiss settlers. In 1849 he graduated from the St. Petersburg Academy of Arts.

In 1851 Denier opened the "Daguerreotype studio of the artist Denier" in which some of the future well-known artists such as I. Kramskoj worked as retouchers. Denier was a famous master of the photographic portrait. In 1859 Denier's works were shown in a session at the Paris Academy of Science. Denier was a member of the Société française de photographie. After the exhibition of the St. Petersburg Academy of Arts in 1860 Denier was given a title of the "Photographer of the Imperial Academy of Arts."

In 1865 the "Album of the photographic portraits of the famous personalities of Russia" was published. As a result 13 publications were made, with each album containing 12 mounted cartes-de-visite. Apart from the photographs of celebrities each album contained one cartes-de-visite illustrating a peasant. Denier participated and won prizes in many Russian and foreign exhibitions—for example in ones which took place in Berlin (1865), London (1862, 1871, 1872), Moscow (1872) and others.

Denier died in St. Petersburg in 1892.

ALEXEI LOGINOV

DENMARK

A few days before the release of Daguerre's process in Paris, the Danish consul general in Paris, the archaeologist Christian Tuxen Falbe, went to see the inventor and get a personal introduction to his work. His quest was not on his own behalf. The consul general came as a representative for the Danish crown prince Christian Frederik, the later King Christian VIII, and in a sense for the people of Denmark. In a letter to the crown prince, Falbe described the visit and the works Daguerre presented to him in the few hours he spent in his studio: "They look like those copperplates that used to be known as 'the black art.' One must use a magnifying glass to see—with the highest degree of admiration—the detail in every paving stone, read every letter in the inscriptions of the street signs, and contemplate even the finest irregularities that are revealed in the joints of plaster figures." The process would, he gathered, become of great interest to both scientists and artists in Denmark.

Over the following couple of decades, Tuxen Falbes premonition proved true. The photographic medium spread to more or less all circles of society with a speed that mirrored the rest of Europe and America. Naturally, the spread of the different processes, photographic formats and trends in some instances came to the Scandinavian countries with a slight delay. The vitrotype and the pannotype came to Denmark around 1855, and negative based paper prints, used from the beginning of the 1850s, were made on salt paper until around 1857, when salt was replaced by albumen. Collodion emulsion chloride paper came to be used alongside albumen paper from 1865, both lasting into the 1890s, and from 1880 gelatin emulsion paper and similar types competed with the two. Cartes-de-visite were introduced in Denmark in 1860 by the photographer Rudolph Striegler, and the cardomania throve until 1865. In 1866, the somewhat larger cabinet cards replaced the cartes-de-visite, and in the 1880s these saw a revival in the family photo albums with photographs of stars from the theatre. Stereoscope photographs became very popular around 1850, and their popularity lasted into the 20th century. The postcard format was introduced in the last part of the 1880s, and unlike the other card formats, the postcard came to stay.

By the 1860s, people of all classes could afford having their portraits taken by one of the growing number of studio photographers all over Denmark. Having one's portrait taken was a fashionable type of leisure, and a signal to the community that one's priorities were in the right order. Placing oneself and one's family on the photographic map signified an interest in family chronology, social and industrial progress, and society in general. The standardized portraits were placed in albums, hung on walls and distributed amongst friends and family. The Danish Royal family, with King Christian IX in the front and some very photographic daughters behind him, helped promote the image of visually reproducible nuclear family happiness. In pictures of the royal family, the public saw a relaxed atmosphere with family people they could relate to. Cartes-de-visite, cabinet cards and postcards with the royal family were cherished memorabilia in the Danish homes, and comparable to the mass produced celebrity posters that are popular today, they projected an image of obtainable idealism that inspired

the growing middle class to follow in their footsteps. The distinguished fairy tale writer Hans Christian Andersen, albeit not a family man, was also among the most enthusiastic clients in the photographers' studios right from the beginning. With his more than 250 portraits he was the most photographed writer at his time.

It was, of course, not just idyllic pictures of happy families that were produced in the photographers' studios during the 19th century. Deathbed portraiture, although not as widespread in Denmark as in America, England or France, was part of the visual memento mori culture, especially during the last decade of the 19th century and a couple of decades into the 20th. The custom was not standardized, and yet the photographs that remain reveal visual aspirations that evoke the classical tradition from deathbed painting. Social and documentary photography, on the other hand, did not break through until the beginning of the 20th century. The most celebrated photographer in this domain was the reporter Jacob A. Riis, who had immigrated to America and photographed the poor people of New York, reproduced in *How the Other Half Lives* in 1890. But in Denmark, the closest thing that came to social documentary photography were the photographs taken of the slum quarters in Copenhagen before the redevelopment at the turn of the century by people like Frits Bentzen, and the photographs Peter Elfelt, photographer to the king, took of social outcasts in the Copenhagen street life. These, however, were mass produced and sold as commercial postcards, and many of the unfortunates were brought into the studio and photographed away from their surroundings.

The question of whether or not photography should be acknowledged as a creative genre with affiliations to art was not asked with the same energy and enthusiasm as in for example England. The discussion of its status came up on a regular basis throughout the nineteenth century, but the arguments were less heated and the authorities that rejected its creative potential rarely contradicted. It was not until the latter part of the 20th century that photography was appreciated as an art form. As an example of the moral double standards of artists towards the closing of the 19th century, painters such as the Skagen group, counting Michael Ancher, Anna Ancher and P.S. Krøyer, frequently used photography as a means to create quick sketches from which to paint their impressionistically inspired views of the town of Skagen, its people and the sea. But the photographs, although highly aesthetic and well composed works in themselves, were never recognized as independent accomplishments. Technical painterly skills defined the artist, and photography was merely a useful tool in the creative process.

Jannie Uhre Ejstrud

See also: Daguerre, Louis-Jacques-Mandé; Cartes-de-Visite; Astronomy; Domestic and Family Photography; and Stereoscopy.

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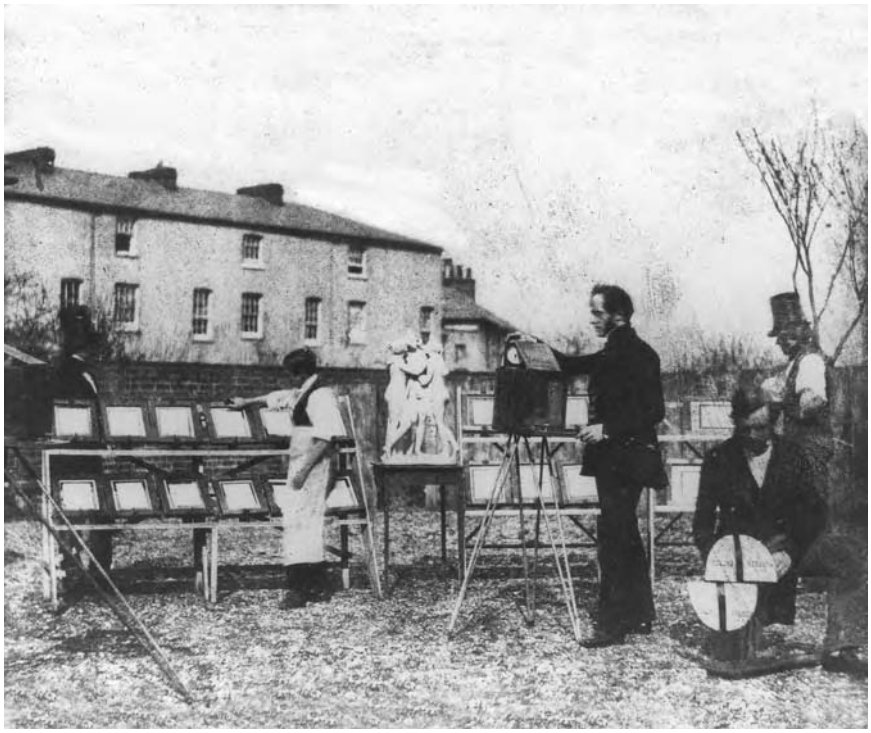
DEVELOPING

Processes (general)

Broadly considered, developing refers to making a latent image visible by means of a chemical agent, following the exposure of a light-sensitive surface to light. Given this definition, the use of a solvent—such as lavender oil in the original heliographic process, or water in the cyanotype process—would qualify as developing. Similarly, the use of mercury vapors to bring out the image in the daguerreotype process would also qualify as developing.

To prevent such examples from multiplying in a bewildering manner, it is necessary to redefine developing in a narrower sense: a controlled chemical reaction in which ions associated with an exposed, light-sensitive silver compound (silver chloride, iodide, bromide, or nitrate) respond to the introduction of a solution containing a deoxidizing reagent by causing metallic silver to precipitate in the form of a visible image.

From this narrower definition, two kinds of developing may be distinguished: chemical development and physical development. Chemical development refers to the direct reduction of exposed silver halide forming the latent image to silver by a reagent in the developing solution. Physical development—as applied to nineteenth century photography—refers to an indirect reduction



Henneman. The Reading Establishment.
The Metropolitan Museum of Art, Gilman Collection, Gitft of The Howard Gilman Foundation, 2005 [2005.100.171ab(b)] Image © The Metropolitan Museum of Art.

of silver nitrate to silver by a reagent in the developing solution; the silver is then deposited on the latent image serving as a framework for image formation.

Physical development was the predominant manner of developing in the early days of photography—a period spanning 1839–1862. During this time, it was mostly used for negative-making purposes, although a few photographers in the 1850s, like Louis-Désiré Blanc-quart-Évrard and Thomas Sutton, also used it to make positive prints from negatives. Significant photographic processes that utilized physical development during the period included the calotype process (beginning 1839–1840), the albumen process (beginning 1848), the wet-collodion process (beginning 1850–1851), and the waxed-paper negative process (beginning 1851). Significant reagents used in physical development during the period included gallic acid (beginning 1839–1840), ferrous sulfate (beginning 1844), and pyrogallic acid (beginning 1850–1851).

For a photographic image to be formed by physical development at the time, there needed to be an excess of silver nitrate in proportion to the halide used to make the light-sensitive surface; otherwise, the operation would not have succeeded due to a lack of oxidizing material.

Mid-nineteenth century photographers obtained an excess of silver nitrate in one of two ways: either they could leave excess silver nitrate in the sensitive surface being formed (which necessitated an immediate exposure and development while the negative was still damp due to the oxidizing tendency of the silver nitrate) or they could rinse the sensitized negative in water (thus removing excess silver nitrate), dry it for exposure at a later date, and then reintroduce excess silver nitrate to the developing solution just prior to development. The former "wet" method predominated with calotype and early wet-collodion photography (1839–1862); it continued to be used with wet-collodion until the 1880s, due to its familiarity and the relative brevity of exposure times that were obtained with it. The latter "dry" method was confined to the dry, waxed-paper negative and dry-collodion processes (1851–1862). While convenient for the voyager, the dry processes suffered from one major drawback when coupled with physical development: exposures were much longer than with the wet processes.

With physical development, the developing solution needed to be acidic or neutral, rather than alkaline, in order to prevent a spontaneous reduction of the excess silver nitrate to silver, which would have blackened the image entirely. This being the norm, there were a few noteworthy exceptions. In 1851, two French photographers, the abbé Léon-Emmanuel-Simon-Joseph Laborde and Baron Louis-Adolphe Humbert de Molard, succeeded in reducing exposure and development times by adding trace amounts of acetates to developing solutions, making them mildly alkaline. In 1856, an English photographer, W.D. Parr, added sodium acetate to a preliminary iodizing solution, causing it to function as a built-in accelerator. The success of these experimental methods was limited, and their unreliability (given the excess silver nitrate in solution) prevented them from being fully adopted.

Chemical development may be said to have begun around 1860, with the anonymous American practice of fuming an exposed, dry-collodion plate with ammonia, prior to developing it with a neutral solution containing pyrogallic acid. More certifiably, it may be said to have begun in 1862–1863, with the publication of Major Russell's bromided pyro-ammonia formula. By the end of the nineteenth century, it was the prevailing method of developing.

At first, chemical development was exclusively used to make negatives, but by the 1880s, it also had come into regular use for developing positive prints. During this period, chemical development was used in the following photographic processes: the dry-collodion process (beginning ca. 1860), the gelatin dry-plate process (beginning 1871), and the various bromide, chloride, and chlorobromide positive printing processes (beginning ca. 1874). Significant reagents used during this period were pyrogallic acid (beginning ca. 1860), hydroquinone and pyrocatechin (beginning 1880), amidol, glycin, metol, and para-aminophenol (beginning 1891).

In order to form a photographic image by chemical development, the excess silver nitrate used in forming the light-sensitive silver halide needed to be removed. At first, this was achieved by rinsing the sensitized sheet of glass or paper in water; but following the introduction of gelatin dry-plates in 1871–1873, the silver bromide emulsion was rinsed prior to being coated on the glass. Following the rinsing stage, only the silver halide remained, so a reagent could then be employed in an alkaline solution in which the alkali acted as an accelerator, reducing both exposure and development times by absorbing the released halogen at the same time as the reagent reduced silver.

In spite of the great improvement made in removing the excess silver prior to development in an alkaline solution, chemical development still had an undesirable tendency to reduce all of the silver halide in the negative to silver, rather than just the exposed areas. This problem—known as chemical fog—was only partially held in check by the use of a restrainer (i.e., ammonium bromide) in the earliest pyro-ammonia developing solutions, because the reagent exhausted rapidly in the absence of an oxygen-absorbing preservative. In this regard, the introduction of sodium sulfite in 1882 marked a significant advance. Similarly, the silver bromide grains suspended across the gelatin dry-plate emulsions required more selective developing agents, resulting in the introduction of numerous patented reagents from 1880 onwards. With the introduction of the first metol-hydroquinone combination in 1893, the stage was set for most of the black-and-white developing formulations that would predominate in the twentieth century.

Alan Greene

See also*:* Calotype and Talbotype; Dry Plate Negatives: Gelatine; Fixing; Waxed Paper Negative Processes; and Wet Collodion Negative.

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DEVERIA, ACHILLES (1800–1857) AND THÉODULE (1831–1871)

Father and son Achilles and Théodule Devéria practiced photography on paper from the early 1850s. Achilles Jacques Jean Marie Devéria, born on February 6, 1800 in Paris, also raised painters Laffite and Girodet, and was primarily known for his work as a draughtsman, engraver, and especially lithographer. In this technique, which he intensively practiced beginning in the 1830s, he left an enormous and eclectic body of work, in particular, reproductions of pictures of his brother, the painter Eugene Devéria (1808–1865).

When he entered the Estampes de la Bibliothèque Nationale in 1848, he was interested in photography on paper like many painters and engravers of his generation. Among his friendships of the period was one with Louis Robert, a photo hobbyist and director of the painting workshops of the Porcelain factory of Sevres - for whom Devéria worked episodically from 1839 to 1848. Nevertheless, it remains difficult to determine with certainty the degree of involvement Devéria had in the new medium. It appears in 1853 in Paris at the beginning of the publication of the first French scientific work illustrated by photography, *Photographie zoologique ou représentation des animaux rares des collections du musée d'histoire naturelle*, which contained photogravures by Abel Niépce de Saint Victor based on photographs made by Louis Rousseau, assistant at the Museum and,

it would seem, the father Devéria. Another indication of the interest he brought to the technique is the existence of a photographic album of his family (Getty collections) containing various portraits made between 1853 and 1857 and some of which, when touched-up, could be used as models for his lithographs. However, it remains difficult to determine with certainty their author: Devéria father or son? No print to date that was modified has been attributed to him with certainty. His involvement was of short duration because he died on December 23, 1857, only a few months after being named curator of the cabinet of the Prints of the national Library.

Better identified is the photographic work of his son Théodule, born in Paris on July 1, 1831. His work was held high regard in the artistic medium of Bohemian romantic upon which his father focused. But according to his son and first biographer, Gabriel Devéria, the decisive meeting for his vocation was with the Egyptologist Emile Prisse d'Avennes in 1843. A visit to the museum of Leyde in 1846 confirmed this and he expressed a new taste for epigraphy. He studied Eastern coptic languages with the architect Charles Lenormand, and Arabic with the Eastern languages while following the teaching of Quatremère at the College of France.

In 1851, he entered the Cabinet of the Prints where his father was then the preserving assistant. It was perhaps his father or of one of his friends such as Louis Robert that, in those years, introduced him to photography. In 1854, with his first darkroom, he photographed the Scribe of the Louvre museum. Another amateur photographer evolving during this period was the amateur archaeologist John B Greene: in 1855 Théodule created lithographs based on negatives brought back from Egypt for a publication of the printer Firmin-Didot, *Fouilles exécutées à Thèbes dans l'année 1855*.

This same year, on recommendation of the Egyptologist the Viscount of Rougé, Devéria entered the Department of Egyptian antiquities of the Louvre, with the mission of helping to catalogue the thousands of excavated objects sent from Egypt by Auguste Mariette, director of the department who worked on antiquities in Egypt and discovered in 1850 Sérapéum de Memphis. Devéria's talents as lithographer and his meticulousness were then important contributions. In 1856, he illustrated Mariette's work *Choix de monuments et de dessins découverts ou exécutés pendant le déblaiement du Sérapéum de Memphis*.

In December 1858, Mariette called him to Egypt to assist in reading inscriptions. It was the first of four voyages during which Devéria, combining drawings, stampings and photographs, endeavored to document various archeological sights as precisely as possible. This first trip led him to Cairo and its surroundings (Saqqarah, Gizeh, Memphis, Louxor, Karnak, Medinet-Abou). The same concern with precision is found in almost the whole of the photographic works then carried out, by having only used the technique of the calotype: inscriptions, objects of excavation, general sights of archeological sites, and, more rarely, landscapes and portraits. His approach to the subject was usually direct, and his images (never more than 20cm × 30cm) have a marked documentary style. The group of images, however, betray his limited technical ability (spots on the negatives, images sometimes fuzzy, prints faded and prematurely yellowed due to inadequate washing.

After becoming preserving assistant of the department of Egyptology of the Louvre in 1860, he returned to Egypt in 1861–62, on this occasion traveling up the Nile as far as the First Cataract (Philae) then into Nubie as far as Ibsamboul. With his return he assisted Mariette in the development of the publication of the first series of descriptions of excavations in Egypt, 1850–54.

At the beginning of 1865, he completed a third voyage in Egypt, in the company of Henri Péreire, Surel, and of the orientalist Arthur Rhoné, during which he also took photographs. This voyage was preserved in an album of 77 plates. In contrast with the photographs taken at the time of the first two voyages, the work is more alive and convivial, being interested more in the protagonists and landscapes than with the sites themselves. In the autumn of 1865 until 1866, he undertook a fourth and last voyage in Egypt with Mariette.

Knighted of the Legion of Honour in 1868, he died in Paris on January 31, 1871, without having seen published the great work of Mariette Bey, to which he had collaborated so much. With his death, a large portion of his papers, handwritten notes, and photographs were sold by his widow to the Louvre. In 1986, the photographs (more than 300 prints and negatives) were assigned to the Musee d'Orsay. Photographs taken at the time of his first voyage (prints and negatives) are also found in the collections of the National Library. It should be noted that although the majority of known images were taken in Egypt, there are also images of Normandy taken around 1859 (negatives at the Musée d'Orsay).

QUENTIN BAJAC

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DEVILLE, ÉDOUARD (1838–1924)
French survey photographer

Édouard Deville surveyor, civil servant (born La Charité-sur-Loire, France, 21 February 1838; died Ottawa, Canada, 21 September 1924). Deville studied at the naval school in Brest, and on his retirement as a hydrographer from the French navy, immigrated to Quebec, Canada, in 1874. He immediately went to work for the provincial government as a surveyor and astronomer and by 1877 he was appointed Inspector of Surveys. In 1880 he joined the federal government in Ottawa to work on western homestead surveys, at which he excelled. In 1881 he was appointed Inspector of federal surveys, the following year he made Chief Inspector, and in 1885 Surveyor-General.

In an effort to extend federal surveys into the western mountainous regions, Deville turned to photography. Using a sturdy but light field camera of his own design, and building on Aime Laussedat's metrophotographie of Paris, Deville developed the mathematical formulae that converted oblique views taken from mountain peaks into topographic maps. By the 1920s his photo-topography had enabled Canada to a map 52,000 square miles of the western Cordillera at a fraction of the cost of more traditional survey techniques. Although Deville also experimented with copy cameras to reproduce maps for field use, he is best known for having been the first Canadian to use photography as a tool of measurement (photogrammetry). Deville's photo-topography was used in the western mountains up to the early 1950s, long after the introduction of aerial photography, which it complemented.

JEFFREY S. MURRAY

DIAMOND, HUGH WELCH (1809–1886)
British photographer

Hugh Welch Diamond's father was a surgeon for the East India Company who later settled in Kent, where Diamond was born. Diamond followed in his father's footsteps by studying medicine first at the Royal College of Surgeons beginning in 1824 and continuing his work in 1828 at St. Bartholomew's Hospital. He set up private practice in Soho Square shortly after this and became a Fellow of the Royal College of Surgeons in 1834. During this early portion of Diamond's career, photography was not yet a feasible form of artistic expression or scientific analysis. However, in the 1840s when photography became more accessible Diamond both shifted his medical interest from surgery to psychiatry and began to practice and write about photography in conjunction with his profession, becoming known as the "father of clinical psychiatric photography." Diamond's photographs can be found, without accompanying case studies, in the collections of the Royal Society of Medicine, the Norfolk Record Office and the Royal Photographic Society.

Diamond studied psychiatry at Bethlem Hospital under the tutelage of Sir George Tuthill in the early 1840s and became resident superintendent of the Female Department of the Surrey County Lunatic Asylum in 1848, a post which he inhabited until 1858. This decade marks Diamond's most significant achievements as both a clinical psychiatric photographer and writer of technical and medical treatises about photography. Diamond's work during this period relied not just on advances in photographic practice such as the calotype and glass plate collodion photography, but the widespread belief that photography was intrinsically linked to empirical truth, making it useful for such scientific fields as psychiatry, which because of Diamond's work was the first to use photography in a systematic way to "diagnose" and "treat" patients.

Between 1852 and 1854 Diamond published more than twelve articles about photography in the journal *Notes and Queries*, including "On French collodion" (1852); "On photography applied to the microscope" (1852); "On the simplicity of the calotype process" (1853) and "The application of photography to the copying of ancient documents, prints, pictures, coins, etc." (1856). The range of these pieces demonstrates the author's varied interests in photographic technique, the scientific uses of photography, the popularization of photography (particularly the calotype process developed by William Henry Fox Talbot which allowed for use of paper negative and therefore multiple prints), and archaeology, one of the doctor's many hobbies. Diamond read "On the simplicity of the calotype process" to the Photographic Society in November 1853 and the successful article was later reprinted.

In addition to his writing, Diamond was consistently taking photographs of his economically deprived resident patients at the Surrey County Lunatic Asylum and using them to physiognomically identify types of insanity much as Alexander Morison and J.E.D. Esquirol had done before him using line drawings rather than photographs to illustrate their work. Diamond presented a photographically illustrated lecture series on this topic in London in 1852, the photographs from which later formed the basis for psychiatrist John Conolly's 1858 case studies on "The Physiognomy of Insanity" published with lithographic translations of the photographs in *The Medical Times and Gazette*.

Conolly's case studies coupled with Diamond's photographs provide a useful barometer of mid-nineteenth-century attitudes toward the economically disadvantaged mentally ill as well as an indication of how Diamond's

Diamond, Hugh Welch. Patient, Surrey County Lunatic Asylum.
The Metropolitan Museum of Art, Gilman Collection, Purchase, Ann Tenenbaum and Thomas H. Lee Gift, 2005 (2005.100.19) Image © The Metropolitan Museum of Art.

supposedly objective photographs were influenced by such modes of artistic photography as were practiced by Diamond's friend Henry Peach Robinson, who took one of the only known photographic portraits of Diamond, and formal studio portraits. One of Conolly's case studies of religious melancholy, for example, was inspired by Diamond's c. 1852 photograph of a modestly dressed, pensive young woman wearing a large cross around her neck. The woman sits in front of a black curtained backdrop as if she is in a portrait studio and rests her left elbow on a plain wooden table while her hand rests against her cheek in an iconographic gesture suggestive of melancholy when used in painting and sculpture. The subject has clearly been posed and manipulated to produce the necessary effect leading to her "diagnosis." Conolly's text responds to both the subject's pose and her facial features, stating that

> "we discern the outward marks of a mind which, seemingly, after long wandering in the mazes of religious doubt, and struggling with spiritual niceties too perplexing for human solution, is now overshadowed by despair. The high and wide forehead, generally indicative of intelligence and imagination; the slightly bent head, leaning disconsolately on the hand; the absence from that collapsed cheek of every trace of gaiety. . . all seem painfully to indicate the present mood and general temperament of the patient." (Conolly, 1858)

In other photographs Diamond added suggestive props such as flower wreaths and farm animals to intimate information about the patient's malady.

Diamond offered his opinions about the use of psychiatric photography in an address entitled "On the Application of Photography to the Physiognomic and Mental Phenomena of Insanity" presented to the Royal Society of Medicine in May 1856. In this treatise he outlined the three primary functions of psychiatric photography, which were to record the appearance of the patient for physiognomic study; to identify the patient in the case of readmittance; and to show the patient his or her aberrant appearance in the hope that self-recognition would result in self-help.

Diamond left his post at the Surrey County Lunatic Asylum in 1858 to open a private asylum in Twickenham House, Middlesex, which he operated until his death in 1886. It appears that he stopped taking psychiatric photographs at this time, but his work continued to have a great influence on the psychiatric communities on both sides of the Channel for Dr. G.B. Duchenne, Jean-Martin Charcot and Sir Francis Galton all used photography for medical purposes. Diamond did remain active in the photographic community, however, serving as editor of the Photographic Society's journal from 1859 until 1869 and serving as secretary and a vice president of that organization as well. In 1867 he was awarded the medal of excellence from the Photographic Society.

KIMBERLY RHODES

Biography

Hugh Welch Diamond was born in Kent in 1809, the son of a surgeon who had worked for the East India Company. He studied medicine at the Royal College of Surgeons beginning in 1824 and continued his work at St. Bartholomew's Hospital in 1828. He set up a private practice in Soho Square soon after this and became a Fellow of the Royal College of Surgeons in 1834. Diamond became interested in psychiatry in the 1840s and studied with Sir George Tuthill at Bethlem Hospital. In 1848 he became resident superintendent of the Female Department of the Surrey County Lunatic Asylum and remained in this post until 1858. During this period he became actively involved with the practice of clinical psychiatric photography and wrote articles about the technical and scientific aspects of photography for such journals as *Notes and Queries*. In 1852 he presented a photographically illustrated lecture on the physiognomy of insanity in London. These photographs were used by John Conolly in his 1858 publication "The Physiognomy

of Insanity." In 1856 he presented "On the Application of Photography to the Physiognomic and Mental Phenomena of Insanity" to the Royal Society of Medicine. He opened a private asylum in Twickenham House, Middlesex in 1858, which he operated until his death in 1886, and discontinued his psychiatric photography. From 1859 until 1869 he edited the Photographic Society's journal and served as a secretary and vice-president. In 1867 he was awarded the medal of excellence from the Photographic Society.

See also: Royal Society, London; Calotype and Talbotype; Talbot, William Henry Fox; and Robinson, Henry Peach.

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DICKSON, WILLIAM KENNEDY-LAURIE (1860–1935)

French-born photographer

Born in France in August 1860, to an English father and Scottish mother. Dickson emigrated to the USA 1879 and joined Edison around 1883, working as his 'official' photographer. He married Lucy Agnes Archer 1886. Dickson became involved in motion picture work from 1888; first micro-motion pictures on cylinders, then perforated 35mm film. The electrically-driven kinetograph camera supplied motion pictures for the kinetoscope peepshow viewing boxes, the first commercial motion picture film machines, which were set up in arcades. In 1894 Dickson and his sister Antonia wrote a biography of Edison. Meanwhile he was secretly working with a rival motion picture group, the Lathams. Edison found out, leading to Dickson's departure. Disenchanted by the Lathams he joined Elias Koopman, Harry Marvin, and Herman Casler; the beginnings of the American Mutoscope and Biograph Company, responsible for large-format Biograph films and the Mutoscope coin-operated arcade viewer. Dickson shot many subjects for the company. Settling in England in 1897, he became European cameraman for the British Mutoscope and Biograph Co., and the parent company. In 1898 he filmed Pope Leo XIII in Rome. From late 1899, he filmed the Boer War in South Africa. Subsequently, he worked on experimental industrial projects. Dickson remarried when first wife died, and adopted a son. He died September 28, 1935 at Twickenham, England.

Stephen Herbert

DILLWYN, MARY (1816–1906)

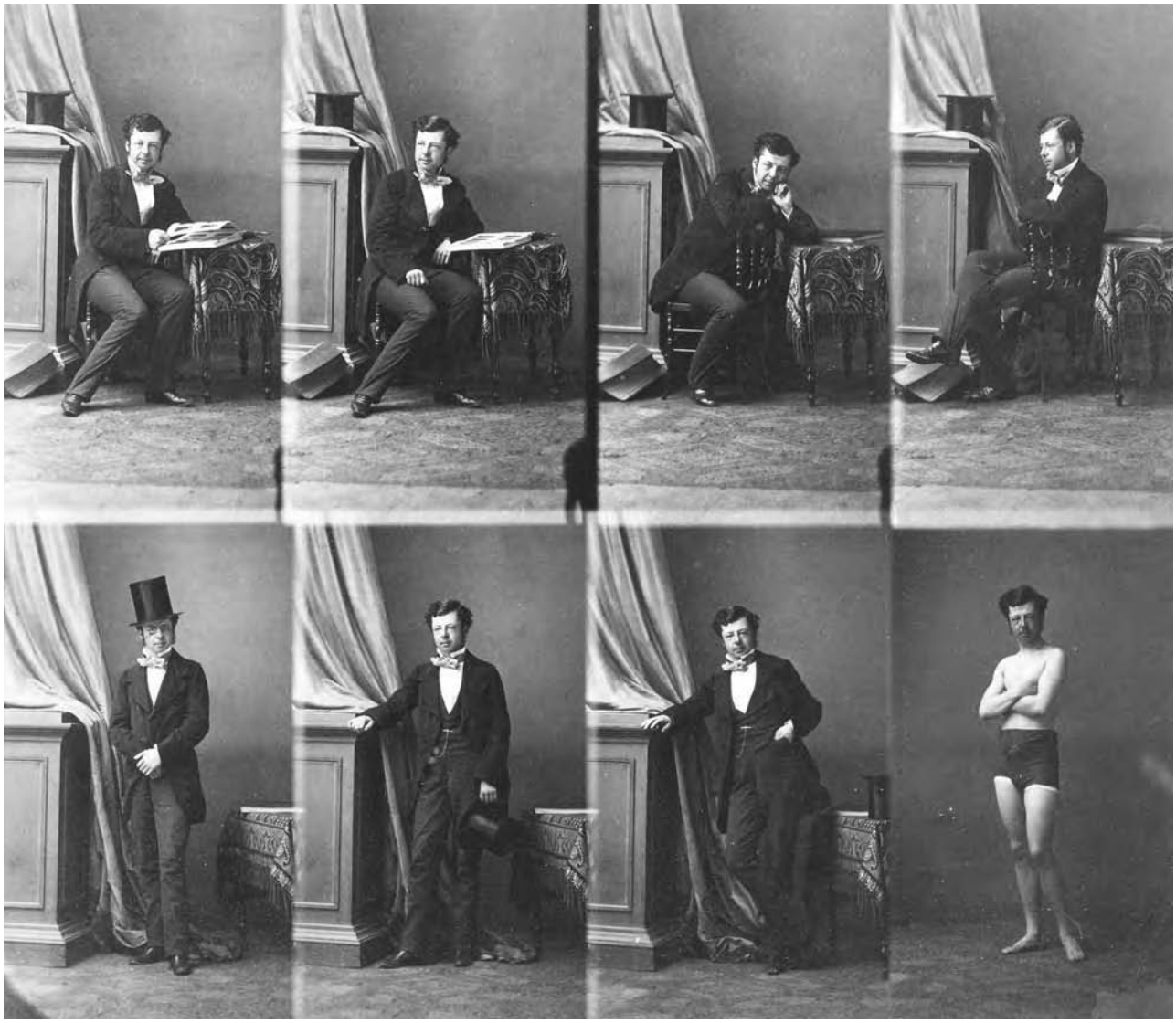
English photographer

Mary Dillwyn was born in Wales in 1816 to Mary Llewelyn Dillwyn and the wealthy industrialist Lewis Weston Dillwyn. Before taking up photography, she was a student of the artist Peter de Wint and made drawings of family members. Her family, which includes William Henry Fox Talbot and John Dillwyn Llewelyn, is well known for their pioneering contributions to photography. Mary Dillwyn is considered one of the first women to experiment with photography. "The Mary Dillwyn Album," in the collection of the National Library of Wales, is a small photograph album (110 × 90 mm) that contains 43 photographs dated to c. 1853, seventeen of which are initialled by Mary Dillwyn. Her photographs consist of flower studies, fowl studies and portraits of family and friends, mainly in outdoor settings. Her portraits are known for their informality and spontaneity, which she achieved by using a smaller camera that allowed for shorter exposure times. Most often noted are her portraits that include family pets and the two images that record the building of a snowman. She married the Reverend Montague Earle Welby in 1857, after which time her photographic activity declined. She died in Wales in December of 1906.

Andrea Korda

DISDÉRI, ANDRÉ-ADOLPHE-EUGÈNE (1819–1889)

André-Adolphe-Eugène Disdéri's (1819–1889) tenacious entrepreneurial spirit led him to open his first photographic studio in 1848 or 1849 in Brest where he had moved from Paris with his wife and infant daughter. Their choice of Brest as a location was precipitated by the fact that his wife's brother, who helped finance this new endeavor, lived there. Disdéri appears to have been self-taught daguerreotypist and became fairly skilled in obtaining natural poses and lighting despite the limitations and challenges of the technique. From the beginning, his wife assisted him in the studio. Around this time, Disdéri also entered into business with Joseph Diosse and opened a diorama to the public in Brest in mid-July 1852. After the diorama failed financially and closed within six months, Disdéri left Brest and his



Disdéri, André-Adolphe-Eugène. Prince Lobkowitz.
The Metropolitan Museum of Art, Purchase, The Horace W. Goldsmith Foundation Gift, 1995 (1995.170.1) Image © The Metropolitan Museum of Art.

family and headed for Nîmes, leaving his wife and her family to maintain the Brest photography studio.

He spent his time in Nîmes researching the new collodion-on-glass negative process and experimented with Gustave Le Gray's waxed paper negative technique. Collaborating with Joseph Jean Pierre Laurent, he was able to cut the exposure time for collodion negatives down to two seconds. They also researched ways to reinforce paper negatives. His first of several books *Manuel opératoire de photographie sur collodion instantané* (1853) summarized his Nîmes research.

Disdéri returned to Paris in 1853 and established Disdéri et cie. at 8, boulevard des Italiens, described by Ernest Lacan in *La Lumière* as "the largest [studio] in Paris." It was spread across two floors. The first floor consisted of a sales area, a framing studio, a reception room. Above, there were two large terraces with skylights, an elegant salon for the ladies and separate laboratories for the preparation of plates, collodion, and printing. An astute marketer, Disdéri had initiated a correspondence with *La Lumière* before his arrival in Paris which created a buzz in Parisian circles and set the stage for what was to become a prosperous enterprise.

It was at this studio that Disdéri first introduced a large Parisian public to a new photographic portrait format—the *carte-de-visite*. Though he did not invent it, Disdéri is the photographer most closely associated with the *carte-de-visite* because he patented it in November 1854. His studio quickly became one of the most popular places to have one's portrait taken. Disdéri developed standard settings and poses for his *carte-de-visites*. Typically, he would show his subjects in a full-length pose in an interior setting with a column, potted plant, and/or curtain in the background. At times he also seated his

subjects and portrayed them absorbed in some activity such as reading or writing, rather than looking directly at the camera.

Along with an ever-growing desire to have one's portrait made, the Second Empire French public also acquired a taste for collecting *carte-de-visite* portraits of contemporary celebrities such as political leaders; actors and actresses in various roles; and literary and artistic figures. Disdéri, as well as other photographers, nurtured and exploited this market through the 1850s and 1860s. Between 1860 and 1862 Disdéri published fortnightly one-franc installments of a *carte-de-visite* portrait accompanied by a biography on the sitter. This series called *Galerie des contemporains* [Gallery of Contemporaries] could be purchased in volumes of twenty-five or could be selected by subscribers according to their own taste.

Disdéri's *carte-de-visite* portrait business enjoyed a great success through the 1850s and 1860s. This was, in part, due to the prime location of his studio as well as his carefully cultivated reputation and his numerous assistants. Records show that in 1855 he employed as many as seventy-seven individuals. During this period Disdéri also took steps to expand his business. In conjunction with the 1855 Paris Exposition Universelle Disdéri formed the Société du Palais de l'Industrie and obtained the rights to photograph all the products and works of art exhibited at the Exposition. In 1861 he opened a studio specializing in equestrian portraits in St. Cloud. His sister and her husband oversaw the production and sale of photographic paper at several locations in Paris between 1863 and 1864. In March 1865 Disdéri opened a studio on Brooke Street in London which was run by a Mister Léon. He also opened an equestrian portrait studio in West London in early 1868.

In the 1850s and 1860s Disdéri patented several other photographic inventions as well. His patents included one for the preparation of a positive paper which did not require the addition of gold salts to a toning bath in March 1858, and in March and April 1867 he patented in Paris and London "a procès de photomoulure pour impression et gravure" which was very similar to the Woodburytype process. Disdéri also published several more books and brochures, *Renseignements photographiques* in 1855; *Application de la photographie à la reproduction des oeuvres d'art*, a brochure in 1861; and in 1862 his best known book, *L'Art de la photographie* which was later translated into English as *Universal Textbook of Photography* in 1864.

Disdéri consistently exhibited his work during this period as well. In 1854 he had a one man show at the Studio Disdéri. In 1855 he exhibited at the Société Internationale Industrie in Amsterdam and at the Paris Exposition Universelle. He won a medal for his enlarged photography at the 1862 London International Exhibition and also exhibited at the 1867 Paris Exposition Universelle. His work was also shown at the Société française de photographie biennial exhibitions in 1857 and 1859.

Despite the fact that many of Disdéri's photographic endeavors thrived through the 1850s and 1860s, he, nonetheless, experienced some great financial blows, declaring bankruptcy several times and was forced to sell aspects of his businesses. Disdéri was, however, resilient and able to regroup, find new backers, and open up shop again and again. As the *carte-de-viste* trend slowed down in the late 1860s Disdéri followed suit by switching to the larger cabinet format portrait. His work in this format was not very well-received.

All of Paris was greatly affected by the political events of the Franco Prussian War (1870-71) and the Commune of 1871. When the Prussians began to bombard Paris, Disdéri, like many Parisian photographers, began to document the current events going on around them. With the limitations of photography at the time, their work consisted of recording damaged buildings, posing soldiers, and sometimes creating photomontages to reconstruct important events. During the Commune of 1871 Disdéri recorded the areas of Paris that suffered damage by the Communards.

Disdéri eventually moved to Nice and set up a new photographic business around 1879. He returned to Paris in 1888 or 1889 and died on October 4, 1889 in the Hôpital Ste.-Anne, an institution for indigents, alcoholics and the mentally ill. A large body of Disdéri's work can be found at the Biblothèque Nationale because of the *dépôt légal* which was instituted in 1851 requiring that copies of all photographic images which were to be sold commercially be deposited in a public archive. Due to the high volume of his production, cartes-de-visite and uncut cartes-de-visite sheets by Disdéri can be found in numerous collections in Europe and the United States.

CAROLYN PETER

Biography

André-Adolphe-Eugène Disdéri was born on March 28, 1819 in Paris to Jean André Disdéri a cloth merchant and his wife Louise Eugénie. He was the eldest of six children. As a young man he briefly studied painting, and between 1837 and 1840 acted in the Théâtre de Grenelle which presented melodramas, vaudevilles, and comedies. The death of his father in 1840 obligated Disdéri as the eldest son to take on the responsibility of working in his father's unstable fabric and accessories business to support his mother and siblings. In 1843 he married Geneviève Elisabeth Francart. They had several children, but only one, Jules (c.1851–1880) survived to adulthood. After the failure of several clothing and accessories businesses Disdéri went into photography.

He is best known for his carte-de-visite business which flourished through the 1850s and 1860s. He worked persistently to promote and expand his enterprise. Toward this end, he filed numerous patents for photographic inventions, including the *carte-de-visite*, and wrote books and brochures outlining his research, technical and aesthetic processes, and philosophies about photography. He died on October 14, 1889 in the Hôpital Ste.-Anne, an institution for indigents, alcoholics and the mentally ill.

See also: Le Gray, Gustave; Waxed Paper Negative Processes; Wet Collodion Negative; Lacan, Ernst; Carte-de-Visite; and Expositions Universelle, Paris (1854, 1855, 1867 etc.).

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DISDÉRI, GENEVIÈVE-ELISABETH (1817–1878)

French photographer and studio owner

Geneviève-Elisabeth Disdéri was born Geneviève-Elisabeth Francart in France in 1817. She married André-Adolphe-Eugène Disdéri in 1843 and gave birth to six children over the following decade, but only one son survived childhood. In 1848, the family moved from Paris to the French town of Brest, where her brother was a prominent member of the community and helped them open a daguerreotype studio. Portraits from their studio are labelled "M. et Mme. Disdéri." Mme. Disdéri is known to have added gold highlights to some daguerreotypes by hand. M. Disdéri left Brest in 1852 due to political and financial troubles, and later opened a successful photographic studio in Paris. Mme. Disdéri remained in Brest and continued to run the studio until the late 1860s, adopting the new collodion technique and producing the *carte de visite* photographs popularized by her husband. In addition to portraits, she produced a series of views of "Brest et ses environs" from 1856-1858. One photograph from the series, "Cimétière de Plougastel, groupe de paysans" (c.1856) portrays both architectural elements and local people. In 1872, she moved to Paris and set up her own photographic studio. She died on December 18, 1878 in a Paris public hospital.

ANDREA KORDA

DIVALD, KÁROLY (1830–1897)

The Divald Family is one of the most famous and widely known photographer-dynasties in Hungary. Károly Divald, born in Selmecbánya, now in Slovakia November 1830—died in Budapest, November 1897, was one of the pioneers of the 1860s due to his Hungarian alpine photography. In the 19th century he was the best-known landscape photographer of the country, and the best known owner of several photographic studie and photoreprographic printing offices. His photos taken of the High Tatra, the Carpathians and the neighbouring small towns became highly popular in contrast to the graphic prints of that time. The photographic studios and printing offices established by him in Eperjes, Bártfafürdö and Budapest, under the name of Károly Divald and Sons (Divald Károly és Fiai) worked efficiently and successfully up until the 1940s. Three of his sons—Adolf, Lajos and Károly Jr.—followed in their father's footsteps, and at the turn of the century the studios had become big enterprises and expanded to the cities of Budapest and Bártfa, Eperjes in the then Upper Hungary, today Slovakia. The Divald's shops were the biggest picture postcard manufacturers of that time. Károly Divald's fourth son, Kornél became a famous short-story writer and art historian, his work consisting of collecting topographical of the ten public monuments of Upper Hungary. He was the first art historian and advocate of monuments who regarded taking photographs of the spotted public monuments, art treasures as an organic part of his work.

Károly Divald was the first in the 19th century to photographed townships and historic monuments in Upper Hungary, a territory which was a part of the Austro-Hungarian Monarchy until 1921. Upper Northern Hungary was the first place where, in the 1860s and '70s, mass tourism and bathing resorts developed, which fostered local tourism. This novelty and modernity, brought about not only considerable changes to the area's way of life but also the introduction of new trades, including photography. The social and professional rise of Károly Divald was in part due to these changes. In the course of this part of his career a new and special genre was formed in Europe, tourist photography, which supplied travelers with souvenir-like products of a particular town or place. Divald's series of books, *Photographs of High Tatra.* Published in *Eperjes* in 1873 is a good

example of this. Photographs were for sale in different sizes and mounted on pasteboard or doubleweight paper in postcard format or in leather cover binding with gilt. Besides the landscapes he took photographs of thermal baths, hotels, mountain climbers' refuge, restaurants and holiday resorts as these had become part and parcel of the steadily growing new middle class, and also fit well into the dynamic development of Upper Hungary in the 19th century. A publication of photographic series in those days, which focused on the natural and historical values of Hungary was not only considered a very modern innovation and a good business adventure, but also a national obligation. After having produced a number of rewarding publications, in 1882 Károly Divald wanted to start publishing a series of books on the artistic heritage of Upper Hungary. Unfortunately, due to the indifference of scientific circles and the lack of a sufficient number of subscribers he could not carry out this plan.

Károly Divald on his father's side was born in a middle class family. His father, János Ferdinánd Divald (1787–1845) was a well-known botanist and forester of Hont and Zólyom counties. Two of his sons, Adolf Divald and József Divald, were also very successsful in forestry and mining. Károly Divald, however, did not follow the footsteps of his brothers: he made good use of his knowledge in the new field: photography. He pursued his studies at the Lyceum in Eger, and after finishing high school he went to Vienna where he received his diploma in pharmacology and chemistry, on 17 July 1855. Subsequently he worked as an assistant in Eperjes. Here he married Borbála the daughter of a wealthy patrician, Lajos Steinhübel. Three of his sons, Lajos (1861–1931), Károly junior (1858–?) and Adolf (?–1931) became professional photographers, and worked together with their father under the aegis of family enterprise. The fourth son of Divald senior, Kornél (Eperjes 1872–Budapest 1931), became a widely known researcher of Medieval art and also an excellent photographer.

Károly Divald started photography in 1860 in a shed in the backyard of his house in Bártfa. Soon his pharmacy was known not for medicine however but for photographs. In 1862, Divald, as a result of severe financial difficulties, sold his pharmacy and chose photography as the means of living for the rest of his life. After many years of hardships, in 1871 his financial situation was consolidated and due to his wife's dowry he moved into a house in Eperjes. This, under the name of Divald Institute, became the center of his business ventures. The building served as a portrait studio, reproduction press, publication center, landscape-shop, and family home. Apart from portrait photography, which provided him with steady income, he continued his photographic experiments with great enthusiasm in High Tatra. According to the rules of contemporary outdoor photography he used large sensitized sheets of glass processed with a colloidal solution in order to achieve high resolution. Developing the negatives in those days was not easy, and it had to be done rather quickly after the photograph was taken. Often, the photographer had to carry the photo-lab on his back throughout his tour. It is for this reason that Károly Divald recruited a small group of 10–20 people from neighbouring villages for a few days to help him. It stands to reason that under these circumstancies the expeditions of Károly Divald often enden up in failure due to the capricious alpine climate.

Divald's work was closely connected to the Carpathian Society of Hungary, founded in 1873, which created favourable conditions for tourism by using the results of scientific exploration of High Tatra through the publication of guide-books, and also by building tourist routes and mountain climber's refuges. All these things proved to be very fruitful for Divald since he received more orders and made more acquaintances. He took part in the work of the Society, of which he also was a founding member, first as a photographer and later as a publisher with the benefit of cheaper printing costs. He doggedly followed the explorers and was among the first photographers to take pictures of the famous, and also World Heritage listed, stalactite cave of Aggtelek in 1890. It was also Divald who took photos of the stalactite cave of Szepesbéla in 1881.

It was due to his great interest in landscapes and townscapes that led Divald to engage in typographical reproduction. For this reason, with his son Károly junior, he went to Münnich in 1877 to study collotype there. This was followed by another journey to Dresden in 1879, where they could see high-speed printing at work. Returning home in tha same year, they opened the first high-speed printing collotype press in Hungary. They were able to print almost everything from architectural drawings to typographical reproductions. After 1879 the Divald Institute took on the name of Károly Divald and Sons Co. Their firm won the monopoly in portrait photogaphy. In addition to the studio they had Eperjes, there were also studios in Bártfa, Igló, Bártfafürdö and Tátrafüred, where they worked mostly during summer months.

Károly Divald in 1890 at the age of 61, handed his extensive business network over to his sons. Lajos Divald inherited the Divald Institute at Eperjes, and Adolf Divald the studio and postcard-shop at Bártfafürdö. Károly Divald junior took over the studios at Igló, Késmárk and Tátrafüred, but soon his interests and strengths were focused on the capital city. After moving to Budapest he opened reproduction presses and a publishing house, and in 1909 he founded a company of shareholders. Apart from Eperjes, Budapest stood more and more in the focus of the activities of Divald photographers not so accidentally. In the first year of WWI, Budapest as the capital city of the Austro-Hungarian Monarchy,

rose to the level of Vienna, Prague and Paris. It was only natural that new industrial and artistic ideas were realized in this thriving environment.

The sons of Divald senior, Lajos in Eperjes, Károly junior in Budapest, in the course of a few years became the most known enterpreneurs of the Hungarian postcard industry. Their annual output consisted of 3–4 million postcards, which well qualified their activity. Károly Divald established a new enterprise with György Monostory in 1912. The employees of the Divald and Monostory Co, which functioned until the beginning of 1940s had taken photographs of virtually all the towns and cities of Hungary, which were published in a series of excellent quality. Lajos Divald's Institute in Eperjes started to decline after WWI, partly because the local industrial area lost its significance, to the extent that the buildings were demolish in the 1970s.

The youngest member of the dynasty, Kornél Divald, was more an art-historian than a businessman. The photo-historical researher of past years brought to surface, Kornél Divald's great impact on documentary photography. The topics of his photogaphs were church monuments and artifacts in Upper Hungary, whose territory then covered one quarter of Royal Hungary. These monuments and often fragments thereof were discovered in artics, behind altars, in granaries and lumber-rooms. These discovered relics of the past such as tryptichs, devotional articles, textiles, paintings were arranged and photographed outdoors by Divald. His goal was simply not just to document, but to research the monuments and artifacts in detail. His composition was comprised of not only taking photographs of the objects, but, since knowing everything about these monuments, knew what to take pictures of. According to Divald, photography was a very important tool similar to writing or taking notes. His original glass negatives and their copies, which are rare, were discovered together with his diary in which he took notes of the specifics of his photography like exposure, technique, topic, and route. Kornél Divald illustrated his books and studies written on the history of architecture whith his own excellent photogaphic collection.

IBOLYA PLANK

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DIXON, HENRY (1820–1893) AND THOMAS JAMES (D. 1942)

English printers, photographers, and studio owners

Henry Dixon was born on 14th April 1820, the son of Thomas Dixon, a printer, and by 1836 was himself apprenticed as a printer.

He took up professional photography before 1860, at which date he operated a studio in London's Sussex Terrace, Bayswater, moving to Albany Street before 1864. His studio operated at two addresses in that street under his own name until 1886 when his son Thomas James joined him as a partner. Thereafter the studio was known as Henry Dixon & Son, and continued under that name until shortly before Thomas's death.

From the late 1860s, he photographed many of the vanishing buildings of the city for the *Society for Photographing Relics of Old London*, along with other photographers including Alfred and John Bool. Their negatives survive in the National Monument Record, and the Guildhall Library.

Throughout the 1870s, Dixon's printing works produced many of the society's carbon prints, from negatives by the Bools and others as well as his own.

Dixon & Son also photographed the animals at London Zoo, as well as portraiture and undertook a wide range of photographic commissions from pianos to copying works of art.

Captain Henry Dixon (1824–1883), who photographed in India and exhibited widely in Britain in the 1860s, was a separate individual.

JOHN HANNAVY

DMITRIEV, MAXIM PETROVICH (1858–1948)

Russian professional photographer

Maxim Petrovich Dmitriev was born in 1858 into a

Dmitriev, Maxim Petrovich. Peasant woman Sinitsina and her five-day old child—typhoid carriers. *From the album The Year of Poor Crops of 1891-1892 in the Nijnij Novgorod Province. Private Collection: Alexei Loginov.*

family of house servants. Although abolished in 1861, this was the time of serfdom in Russia, and Dmitriev's family worked for the local landlord. Even so, he was fostered by a peasant from the Ryasan region and there he received his primary education at a parochial school. Because of hard economic times in his village, he decide to go to Moscow to earn a living. Like many boys of his age and social background, his first job was as a laborer at a dime-house. From his childhood experiences, he knew quite well what the life of the poor was like. It was this knowledge that influenced his range of interest regarding the choice of subject matters in his photographs.

In 1873 he became a bound apprentice to a well-known Moscow photographer M. Nastjukov. At the same time, he attended drawing classes at Stroganov Art College, one of the best of art colleges in Russia. Not only did Dmitriev learn a technical mastery from Nastjukov, he also learned how to view his surroundings with an artistic eye. Thus the large format photos of Volga with its neighborhood and monuments of architecture made by Nastjukov in 1860s, inspired Dmitriev to create his "Volga Collections."

While developing his photographic skills, Dmitriev started to work in studios throughout the various towns of Russia. Then in 1877 he became a retoucher in Leibovsky's studio in Nizhny Novgorod. This was the time when Nizhny Novgorod—the city on Volga, the country's thoroughfare—was becoming known as one of the largest industrial and transportation centers of Russia. Here Dmitriev dove into the midst of the turbulent life of the country. He had the opportunity to watch all classes of society, from paupers and hobos to recently established tycoons. Since 1880 he worked for several years under the guidance of an outstanding Russian photographer, A. Karelin, and learned the mastery of pictorial photography and methods of creating scenes in studio photography, but Karelin's creative ideas contradicted Dmitriev's artistic principles.

In the 1870s the ideas of the peredvizhniks dominated Russian painting and literature, which influenced problems within the society. The commonplace citizen became the main and the favorite character of art. The works illustrated the hardships of the peasants, who at that time, was the majority of the country's society. These subjects became the focus of Dmitriev's creative photography. In 1886 Dmitriev established a photo-studio in which he worked for more than forty years. Dmitriev made studio photo-portraits and his works of high artistic value often won prizes at various exhibitions. He also took photos of Nizhny Novgorod and its neighborhood, often converting them to large-format prints with dimensions up to 50×60 cm and frequently sold the photos to tourists.

The influence of the best landscape painters started to appear within the trends of the peredvizhniks, like I. Shishkin's influence upon Dmitriev's early works. This representation was recreated in Dmitriev's "Volga collection," and as a result became a sensation at Moscow and St. Petersburg exhibitions of 1889. This series consisted of large-format photographs with beautiful Volga landscapes, monasteries and fairs, typical characters of the place as well as scenes of city life. In Russia it was virtually the first significant photographic series devoted to ordinary folk life. In his works he was able to show the new potential of photography. He, like P. Emerson (1856–1936), stuck to the purity of photo-images and the reality of scenes. He won a silver medal at the 1889

Expositions Universelle, Paris due in part to his style and technique.

From 1891 to 1892, Dmitriev created one of the best of his works. He was ordered by the Food Commission for People's Health to travel to Nizhny Novgorod region, which suffered from a severe drought that caused an epidemic of typhoid fever and cholera. At the hazard of putting his own health at risk, he recorded the terrifying woes and illnesses of the peasants. These photographs still make the same impression upon us today that they did back then. Among them, the "Peasant woman Sinitsina and her five-day old child—typhoid carriers," "The peasants receive the charity bread" and others. His photographs not only recorded the events but evoked sympathy as well. Dmitriev was the first photographer in Russia to make an attempt to influence public opinion by means of photography, and as a result, eventually made the government more active in helping the aggrieved. This was the first Russian photo-report and ancestor to the activities of R.E. Stryker and American photographers of 1930s.

By the 1890s Dmitriev opened a photo-type studio in which his album "The Year of Poor Crops of 1891–1892 in the Nijnij Novgorod Province" was published in 1893. The photo-type technology made it possible to increase the number of the album's copies printed. This circumstance alone allowed more people access to the published prints and henceforth, enlarged the influence on public opinion. This album inspired other Russian photographers to depict folk life. The works of such theme started to appear on the pages of magazines and newspapers, ultimately creating the basic principles of the Russian photo-report.

The photos combined the picturesque of highly artistic photography and the documentary veracity of reality. The leading Russian critics and public figures thought very highly of his works. In their opinion, the works would undoubtedly be earmarked as socially significant and be considered a new step in the development of photography. In 1892 Dmitriev's works were awarded a golden medal at the first international exhibition of photography in Paris, clearly placing his as the best among the pictorial professional photographers. He also won a golden medal at an exhibition in Moscow, and in 1895, Dmitriev won the highest award, the diploma at the Holland World photography exhibition. The French photographer F. Nadar highly appreciated Dmitriev's work.

In 1894 Dmitriev took a trip, sponsored by the Communication Lines office, from Rybinsk to Astrakhan via the Volga River on a steamboat named "Olga." In the course of the trip, he was to photograph the views, architectural monuments, and to make ethnographic photosgraphs of the inhabitants of the region. He worked for ten years, making photographs of the region from the mouth of the Volga all the way to Astrakhan, gathering over 4000 negatives in the process. He used these photos as the basis for photo-cards, of which there were over 700 scenes for them. Dmitriev's captured unique photos of the lifestyle of Old Believers, a group of people who lived isolated from the outside world. He photographed their monasteries and their homemade crafts. While he had an interest in the unusual, Dmitriev also had a great interest in taking photographs of the famous Nizhny Novgorod fairs. This compilation of diverse environments created a most interesting panoramic series of sketches reflecting the life of the Volga region and its people.

Dmitriev's aspiration to capture realism in photography in the absence of studio arrangements should be considered as an important step forward in the development of Russian photography.

In 1896 Dmitriev's works were displayed in the photography department of the All-Russia Exhibition in Nizhny Novgorod. His contemporaries said of him: "The most outstanding exhibit here is undoubtedly the work by a local photographer Dmitriev. He exposed in his beautiful showcase, one of the best showcases in the exhibition, more than 100 views of Volga," "This picturesque description of the great Russian river is definitely the central work of the exhibition."

In this year Dmitriev made friends with the great Russian Writer M.Gorky. This friendship led to the creation of a varied series of portraits of the writer. Dmitriev also created a gallery of outstanding figures in Russian culture. On Gorky's request, Dmitriev made photo-sketches of a couple of inhabitants of Nizhny Novgorod, which the writer used as prototypes to create some of the characters of his plays, and the protagonists of his short stories.

In the 1900s, Dmitiriev was still making photographs of the city life, exposing the social contrasts, demonstrating and recording the life of workers, paupers, and the living conditions in night shelters. Dmitriev's disapproving opinion of pictorialism could be found in his exact and realistic photography.

After the revolution of 1917, Dmitriev found himself under the pressure of Soviet authorities since he was a proprietor of a studio that used wage labor. Dmitriev developed problems with his health, a large majority of his negatives were taken from him, and had been directed to make a few photo-reports of the new life in Nizhny Novgorod. In 1928 Dmitriev took part in a large exhibition "10 years of Soviet photography" but even so, little by little his works slipped into oblivion. Dmitriev's death in 1948 in Nizhny Novgorod, then called Gorky, went unnoticed.

ALEXEY LOGINOV

Biography

Maxim Petrovich Dmitriev was born on the 9th of August, 1858 in the village of Povalishino, in the Tambov region. In 1873 he became a bound apprentice to a well-known Moscow photographer, M. Nastjukov. At the same time he attended drawing classes at Stroganov Art College. In 1877 he moved to Nizhny Novgorod and took the position of retoucher in Leibovsky's studio. From 1880 he worked in the studio of a famous photographer from Nizhny Novgorod A. Karelin. Then in 1886, Dmitriev managed to establish a photo-studio, in which he worked for more than forty years. He demonstrated his works at home and abroad, winning prizes. From 1891 to 1992, Dmitriev created a series devoted to the woes of inhabitants of the Volga region, who suffered an epidemic of typhoid and cholera caused by severe drought. For ten years following 1894, Dmitriev made photos of Volga and its neighborhood from the mouth of the Volga to Astrakhan. He took photographs of architectural monuments and made ethnographic photos of inhabitants of the region. In 1894 he became a member of the Russian Photographic Society in Moscow. After the revolution of 1917 Dmitriev found himself under the pressure of Soviet authorities since he was a proprietor of a studio, and the majorority of his negatives were taken from him. Dmitriev died in Nizhny Novgorod in 1948.

See also: Karelin, Andrey Osipovich; Emerson, Peter Henry; Expositions Universelle, Paris (1854, 1855, 1867 etc.); and Nadar, (Gaspard-Félix Tournachon).

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DOCUMENTARY PHOTOGRAPHY

Using the camera as a documentary tool was its favored purpose at the inception. Well before it was embraced as a fine art medium, it was understood to be a unique graphic witness to moment and place. Both in its level of perceived veracity and its ability to be reproduced and disseminated, was the ideal method for communicating the image of the Industrial Revolution.

In the early years, spontaneity and productivity were hampered by technological limitations, as well as the cost of transporting the equipment. The first decades of the medium, however witnessed numerous indomitable adventurers who overcame all logistical obstacles [and their attendant expense] and traveled to the remotest and most challenging terrain.

Images of remote places; the landscapes of the American West; scientific records of archaeological digs and anthropological studies, architectural records; police photography; images of war, as well as the urban and rural poor were among the documents that we associate with the century. Often, the making of these pictures served dual purposes: official and commercial, for example, those made in the Western United States, which were commissioned by an official survey team and also resulted in literally hundreds of thousands of stereo cards and other published manifestations.

Capturing exotic locales by camera was a continuation of an established tradition of publishing prints and illustrated books on the lives, locations and customs of the "exotic," and the "primitive" cultures. As soon as it was technologically feasible, photographers carried on with that business, for which there was a proven audience, with satisfyingly popular results, given that the look of the photographs was such a pronounced departure from the romanticized lithographic interpretations.

Frances Frith, who traveled from London to Egypt in the late 1850s, worked very much in that 18th century style, creating luxurious albums of his views. Désiré Charnay, a French archeologist, photographed ruins in Mexico and the Yucatan in 1857 and Madagascar in 1863 in a similar fashion. Samuel Bourne climbed the Himalayas in 1863, with sherpas dragging his cumbersome photographic lab up the mountains, and subsequently authored a narrative account of his travels. He compared the terrain's beauty unfavorably with the Swiss Alps, which had been photographed by Louis Auguste and Auguste Rosalie Bisson, French brothers, who accompanied Napoleon III and Empress Eugenie there in 1860.

Francis Bedford accompanied the Prince of Wales on his tour of the Middle East in 1862, as a documentarian for Queen Victoria, who would naturally require a reproducible album of commemoration for so important an official journey.

John Thompson, a Fellow of the Royal Geographic Society, devoted his early career to the Far East, but less its structural marvels than its local customs and people. His *Illustrations of China and Its People* in 1873–74, featured 200 Albertype photographic images, concentrating more on people and picturesque locales than distinctive monuments.

Ethnographic views of foreign cultures were made by photographers such as Felice Beato, Samuel Bourne and John Burke, all of whom traveled to the South Asian

regions then under British rule, and Felice Beato in Japan by 1863, very soon after it was open to the West. He published his *Photographic Views of Japan with Historical and Descriptive Notes* five years later.

Under the direction or commission from an official body, or independently, photographers made images of groups of vernacular structures, such as churches, and both very new and very old architectural marvels, starting with Hippolyte Bayard, one of the founding fathers of the medium. Among these, Charles Marville, documented the transformation of streets and alleys of Paris, during and after Baron Hausmann's modernizations. This he did for the Prefecture of the Seine, City of Paris, starting in about 1857. It appears that France, the United States and Great Britain all commissioned photographers to preserve visual records for their archives, but it was not widespread elsewhere.

Baron James de Rothschild commissioned Edouard Denis Baldus in 1855 to record the construction of the rail line from Boulogne to Paris, Lyons and the Mediterranean, which he did through 1859. These were gathered into presentation albums and exhibited at industrial exhibitions, to great acclaim. Baldus, who had photographed the effects of Rhone floods earlier and the building of the new Louvre museum, was the quintessential documentarian of the era, in that he succeeded in applying an artist's mastery of formal pictorial conventions with a prolific provision of detailed information.

Decades later, as the pictorial images of immense engineering marvels became the norm in publications and in the thriving stereo card market, images of the surreal difference in scale between the workers and their product were popular. These are exemplified by the Albert Fernique photographs of the Statue of Liberty's creation in France and installation in the United States.

Nadar (Felix Tournachon) brought a breadth of experience with him to found his Paris photographic establishment in 1853, having been a medical student, journalist, spy, critic, caricaturist, novelist and balloonist. All of this contributed to his catholic interests in subject matter, photographing both above Paris and below. In 1858, he devised a floating darkroom and camera mount for a balloon, creating aerial photographs of the city and later, when electric lights were able to adequately illuminate it, he photographed the catacombs and sewers below, using early arc lamps attached through manhole covers to their batteries.

Documenting wars was the most "modern" manifestation of photography during the century, since they were used as conduits for relaying information about events of wide import. Hippolyte Bayard made calotype images of the barricades in the 1848 revolution in Paris, but it was really with the introduction of collodion glass plates that war became more feasible to document. Roger Fenton was commissioned to photograph the Crimean War in 1855, in part to allay public fears about the manner in which the war was being conducted by the British authorities. He arrived at Balaclava Harbor in March of 1855 with 2 assistants, 5 cameras and 700 glass plates, all to be fit into a horse-drawn darkroom van. Despite all of the obstacles, he managed to make 360 images. Later, James Robertson, Superintendent of the Mint at Constantinople, began photographing and their images were collected for use in albums, exhibited in London and Paris.

After that, the best-known conflicts captured photographically were the Second Opium War, which Felice Beato photographed, presumably at some peril to himself, and, of course, the American Civil War.

Matthew Brady, and 22 photographers working for him, made a tirelessly prolific record, the most comprehensive of the century. From the first Battle of Bull Run of 1861 to the surrender at Appomattox in 1865, thousands of images were made and transmitted to the press for publication. Using 16 × 20, 8 × 10 and stereograph cameras, his men photographed literally everything except the actual battles, due to the still lengthy exposure times. The first publication to come of it was *Incidents of War*, which only recorded Brady's own name, although he was primarily working as an impresario.

The period after the war was one of increasingly rich documentary possibilities for photographic artists, who set out on official missions, creating a body of images uniquely evocative of the American idea of Manifest Destiny, and very much prized by the public worldwide.

Timothy O'Sullivan, one of Brady's war photographers, joined the geological exploration of the 40th Parallel Survey in 1873, photographing Canyon De Chelly National Monument in Arizona. William Henry Jackson went on the Geographic Survey of the Territories in 1870 and in 1875 was shooting 20 × 24 in. plates of the Rocky Mountains to adequately express their grandeur (naturally, all prints were at that time were contact prints). Both Carleton Watkins and Edweard Muybridge were photographing Yosemite with large plates in that decade.

Edward S. Curtis, an established Seattle photographer, made a monumental work of photographing the Native tribes of North America, which he recognized were already endangered, and with financial support of the banker J.P. Morgan, produced a 20 volume survey. These are heroic, formal and romantic, rather more pictorial than objective record, but, nevertheless, these minutely detailed renderings were long used as reference points for identifying tribes.

Photography's evolution was towards ease and rapidity of operation and, hence the capability to capture more ordinary life. Thomas Annan's images were of the closes, wynds and buildings in which the poor lived and

O' Sullivan, Timothy. Field Where General Reynolds Fell, Gettysburg. *The Metropolitan Museum of Art, Gilman Collection, Purchase, Ann Tenenbaum and Thomas H. Lee Gift, 2005 [2005.100.502.1 (37)] Image © The Metropolitan Museum of Art.*

were commissioned by the Glasgow Improvement Trust in the 1860s were stark in their dissimilarity to other graphic representations of poverty, due to the exacting detail and the matter of fact gazes of the subjects, who are, after all, like the natives of other places that photographers were traveling to in that decade.

After he returned from the Far East, John Thompson expanded his interest in people and customs to his native London, publishing *Street Life in London* in 1877. To a modern eye, Thompson's images look the most like candid snapshots of the twentieth century, despite the fact that he would have been a conspicuous figure in the streets with his cumbersome equipment.

Jacob Riis, a Danish born news reporter without photographic training, took up the camera to reinforce his advocacy of the slum dwellers of New York's Lower East Side. Because of the speed and preparation and execution, pictures of this urban milieu seem compositionally spare and drawing upon minute details that are discovered through assertive examination. Riis' aim was to mobilize the public to take up the plight of the poor through his books like *How the Other Half Lives* (1890).

Riis' work was the counter opposite of Oscar Rejlander, who endeavored to capture the Victorian sentimentality of street urchins for the marketplace. There were no qualms on his part of stage managing these tableaus and portraits in his studio and was unapologetic about their theatricality.

Paul Martin, a former engraver, made truly candid photographs in the 1890s by concealing his portable camera in a parcel. In that way, the impression is that of a cinematic "slice of life," something that prefigures the work of the great documentarians of the twentieth century.

Even in the age of the daguerreotype, photography was immediately partnered with medical science as an essential recording device. The first micrographs were taken by John Benjamin Dancer, and although an atlas of engravings based upon micrographs by Jean Bernard Foucault was issued in Paris in 1845, it was later improvements in lenses and shutters that catalyzed this union. Photographs were used to illustrate medical conditions as a matter of course by the late 1850s, and visual symptoms of diseases were recorded for reference, and already an established aspect of the practice by 1870.

Photographs of the appearance of mental patients were made by Hugh Welch Diamond starting in 1852, and lantern slides were even employed therapeutically for the entertainment of mental patients in the Philadelphia Hospital for the Insane.

The medical photographic experiments of Duchenne de Boulogne, a Paris neurologist who published a seminal text on physiognomy, were well known to Charles Darwin, who was acquainted with photographers Julia Margaret Cameron and Rejlander, from whom he commissioned photographs as evidence of his own inquiries into human physiology. It is Darwin that most historians consider the first scientist to have used photographs as the basis for a published theory.

Darwin's cousin, Francis Galton, a leading biological scientist, endeavored to gather statistical data from quantities of photographs, but there was not yet a uni-

form method for making photographic records, and so, gradually, the need for consistent administration of photographs led to guidelines that would result in measurable comparisons. This is the method that was employed in criminology starting in the 1870s.

The "mug-shot" became a protocol in the arrest of criminals from the 1840s, and crime-scene photography was a mechanical aid, much in the way that medical photography was employed, for evidentiary purposes, with confidence in photograph's virtuosity in capturing more than the naked eye. It was Alphonse Bertillon, hired by the Paris Police Service in 1879, who implemented strict guidelines for how accused were photographed upon arrest. "Bertillonage" consisted of an exact proportion, the profile, and mounting the image on a card with the supporting data.

It is not a coincidence that the rapid advances in the technology of photography were catalyzed by the great confidence that the public placed upon it from the start. It was, after all, an imperative part of the period of the World Expositions, celebrating how universal applications of science and technology were bringing the whole world closer, and photography was acting as a conduit for that information as well as exemplar of those ideals.

DEIDRE DONOHUE

See also: Itinerant Photography.

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DODGSON, CHARLES LUTWIDGE [LEWIS CARROLL] (1832–1898)

British author, mathematician, Oxford don, and amateur photographer

Charles Lutwidge Dodgson, better known to the world by his pseudonym as the children's author, Lewis Carroll, was born on 27 January 1832 the eldest son and third child of Charles and Frances Dodgson. His father was a gifted man taking a double first in classics and mathematics at Christ Church, Oxford where he received a studentship that gave him tenure to remain within this academic environment for as long as he chose. But when he married Frances Lutwidge, the college authorities required he give up the post. At first he became the perpetual curate of Daresbury, Cheshire, where Charles was born, before moving to Croft in Yorkshire, which offered a more comfortable standard of living for his rapidly expanding family that finally numbered eleven children in all.

As the eldest son it was perhaps inevitable that Dodgson would follow the example of his father and from an early age his education and upbringing was directed towards that goal. After a brief and formative period at Richmond School, Dodgson became a pupil at the distinguished public school in Rugby where gentlemanly conduct, morality and Christian worship were valued more than academic attainment. For Dodgson, always the intellectual, his time at Rugby was deeply unhappy and it must have been with some sense of relief that he was accepted (matriculated) into his father's old college of Christ Church in 1850 where, in common with most graduates, it was fully expected, he would train for the priesthood, take holy orders and join the growing ranks of the clergymen who devoted their lives to the welfare (spiritual and otherwise) of others. But religious doubts and personal anxieties held him back from full ordination. However, he was ordained as Deacon in 1861, and this allowed him to conduct church services and become a Reverend gentleman, a designation that fitted his personality and outlook at Christ Church which, for the next thirty-seven years lay at the very heart of Dodgson's existence. It was his home and place of work

Carroll, Lewis. Alice Liddell as "The Beggar Maid."
The Metropolitan Museum of Art, Gilman Collection, Gift of The Howard Gilman Foundation, 2005 (2005.100.20) Image © The Metropolitan Museum of Art.

and the centre of his intellectual, spiritual and emotional life. In every sense he was an "Oxford man."

When Dodgson entered Christ Church, photography was just emerging from its early and formative period of the 1840s, to become during the 1850s, widely accepted as a social accomplishment for those with sufficient disposable income and adequate leisure time to invest in its success. It was Dodgson's appointment as a lecturer in mathematics in November 1855 that gave him the financial independence to consider photography and with the encouragement and example of his colleague Reginald Southey, an accomplished photographer himself, Dodgson began photographing in May 1856. It became his major preoccupation during the next twenty-five years, during which time it has been estimated he took about three thousand negatives, the majority of which were portraits and all made using the collodion process. A survey of his photographs reveals that, contrary to widespread belief, only fifty percent of these were of children, the remainder being of adults and families (30%), Dodgson family photographs (6%) and topography (4%), the remainder being miscellaneous studies of still lives and paintings. Few amateur photographers of the time can match this output as most gave up after the space of just a few years when their enthusiasm waned and fashionable pastimes changed.

In his first flush of enthusiasm Dodgson took his camera with him during the "long Vacation" away from Christ Church taking the opportunity to photograph patient relatives and friends both in London and Croft. Even at this early stage it is clear that Dodgson had mastered the difficult techniques of the collodion process, which were far from straightforward, and understood how to calculate exposure times by looking at the light and estimating its power. Both were considerable technical achievements and not readily achieved, but it is entirely in keeping with Dodgson's personality that he persevered until he achieved perfection. Apart from Southey, to whom he turned initially for practical advice, he also studied the work of other photographers at the annual exhibitions of the Photographic Society of London, where he especially admired the works of William Lake Price and Oscar Rejlander. In later years he also appreciated and collected the work of Lady Clementina Hawarden and Julia Margaret Cameron. In his quest to become an artist he also visited fine art exhibitions at every opportunity where he carefully studied the works of art in great detail, making notes about the composition and the arrangement of hands for use in his photography. He was painstakingly meticulous in everything he did and nothing would deter him once committed to a particular course of action. The apparently contradictory aspects of his personality, artistic and imaginative on the one hand, and pedantically careful on the other, became the mainspring of his creative output, both as Charles Dodgson, the photographer, and as Lewis Carroll, children's author.

The twenty-five years of his photography falls into three quite distinct phases, the latter two characterised by his use of a photographic studio. The first phase, which ran from 1856 until 1862 saw Dodgson at his most productive, fired up with the all the enthusiasm of a beginner in love with his medium. During this period he added the better part of seven hundred negatives to his inventory, some of his most memorable photographs among them. This is also the period that saw Dodgson working extemporaneously without a permanent studio. Instead he would rig a temporary backdrop of dark cloth outdoors to create a suitable environment. Above his sitters he draped a diffuser of muslin to soften the light. Even though it would have dramatically shortened his exposure times he rarely used direct sunlight, preferring smooth expressive lighting.

From the very start Dodgson concentrated on taking portraits, an aspect of photography that also sets him apart from most of his contemporaries who much

preferred the idyllic charms of the countryside and picturesque ruin. Unlike trees and distant landscape portraiture presented very real challenges to every photographer who sought to reach beyond the exterior surface and express something of the personality of his sitters. Popular myth portrays Dodgson as a shy, retiring individual, ill at ease in company and hesitant in conversation. Based on the evidence of his portraits the very reverse seems to have been the case as Dodgson clearly enjoys a wide social circle of relatives, friends and acquaintances who invariably appear comfortable before his camera. He posed his family groups with great care and characteristic attention to detail, creating a vital composition dependent upon the willing co-operation of all concerned. With children he often set his camera below their eye line, looking upwards slightly to dignify their features, and one can well imagine him kneeling beside the tripod engaging the child's attention before lifting the lens cap to make the exposure. How different to commercial studios where formulaic poses and wooden expressions were commonplace.

The photograph which best exemplifies this early period is his portrait of Alice Liddell as *The Beggar Maid,* made during the summer of 1858. Dodgson's relationship with the Liddell family and the story of how he took the children rowing to Godstow one summer's afternoon and invented the story that was to become *Alice's Adventures in Wonderland* (1865) is part of the myth and legend that surrounds the man. Much has also been made of his supposed association with Alice, which has him falling in love, proposing marriage, and being rejected by Mrs Liddell. This speculative narrative has no basis in fact as Dodgson's diary, the usual source of day-to-day knowledge, is missing for this crucial period. Further speculation surrounds his study of *The Beggar Maid,* which is frequently offered in evidence of his alleged unhealthy fixation with the six year old Alice whose exposed nipple is seen as a corroborative truth. But this study photograph is most frequently seen out of context and separate the paired study made at the same time showing Alice dressed as a young lady in her best outfit. Following Rejlander's example, it is easy to believe that Dodgson originally intended both photographs to be seen as a diptych contrasting wealth and poverty. The aesthetic and technical quality of *The Beggar Maid* ensured its primacy, relegating the other study to little more than a Liddell family photograph.

The second phase of Dodgson's photography covers the period from 1863 to 1871 and is characterised by his rented use of a photographic studio in Badcock's Yard, close to Christ Church, Oxford. Here, for the first time, Dodgson had a place he could dedicate exclusively to photography, with a darkroom to prepare and develop his collodion plates. However, he rarely printed his own photographs, preferring to hand the task to professional photographic printers in London, and later in Oxford, where consistent results were ensured. Working within a studio setting imposes its own limitations upon a photographer, not least the amount and quality of available light, which in the case of Badcock's Yard seems to have been less than ideal as many of the portraits Dodgson made there lack the spontaneity of his outdoor portraits. It was however a base, a proper photographic studio where he could invite distinguished individuals and colleagues to sit before his camera. Even so, his work in Badcock's Yard was only one part of his photography with increasing numbers of photographic forays into London and elsewhere dominating the pattern of his vacations. The nine years of this middle period are those of his greatest creativity and maturity as he not only added the better part of twelve hundred negatives to his inventory but also published *Wonderland* (1865), *Phantasmagoria* (1869), and *Looking Glass* (1871) under his pseudonym of Lewis Carroll.

In October 1868 Dodgson had the good fortune to move into new accommodation at Christ Church. With ten rooms on two floors they were far larger than anything he had previously occupied and it was here, on the roof which was readily accessible, that he came to build his own photographic studio. It took almost four years for Dodgson to obtain the necessary permissions and build the studio but clearly he thought the effort and expense worthwhile as it allowed him to bring together all his photographic activities under one roof and in March 1872 he made his first portrait there. This final phase of his photographic career is perhaps characterised as the period when he might have flourished given the ideal circumstances of his studio, but which saw him less actively involved than ever before, taking on average between sixty and eighty photographs a year. In some years he barely photographed at all and seldom took his camera with him when he travelled. Teaching, writing, and family commitments all made demands upon his time and little by little he began to turn away from photography as other interests took precedence. His most frequent and favourite sitter was Alexandra Kitchin, better known by her pet name of "Xie." Over the years he photographed her more often and in a wider variety of costumes and settings than any other person and so she, above all others, has come to epitomise the period of the Christ Church studio.

Whenever Dodgson's photographs are reviewed or mentioned the one issue which dominates the discussion is his relationship with children and young, prepubescent girls in particular. There is a widespread notion that Dodgson was a pedophile, someone who preyed upon children, using photography as his primary means of approach and gratification, a claim that is given credence by the photographs he took of children in the nude. But there is not a shred of evidence or a single photograph

to support these unfortunate claims. More dependable are his diary entries, which reveal that he made nude photographs on eight occassions over the course of thirteen years and these involved the willing participation of both children and parents of just six families. This is not the record of a habitual voyeur, pornographer, or pedophile, but the response of an overtly sentimental bachelor with artistic inclinations to the innocent beauty and grace of childhood. To Dodgson children were magical, a gift from God that gave meaning and purpose to his life as a reverend gentleman, children's author and photographer. Throughout his life their company reaffirmed his sense of humanity and fuelled the vital spark of creativity that informed both his writing and photography. He was a polymath of remarkable talent whose legacy still enriches our lives today.

ROGER TAYLOR

See also: Photographic Society London; Price, William Lake; Rejlander, Oscar Gustav; and Cameron, Julia Margaret.

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DOMESTIC AND FAMILY PHOTOGRAPHY

Domestic photography during the nineteenth century was defined by two distinct, though inter-related practices. The first and by far the most important of these was a demand for imagery on the part of middle class households, a demand that began with a multi-faceted use of portraiture and, after mid-century, came to include an unprecedented acquisition of mass produced images. Compared to this acquisition of images, the actual taking of family photographs was, until the 1880s, more important as an ideal than as a practice. Yet when a practical technology for home photography finally became available, it yielded not only a second wave of photography's industrial development but also the beginnings of a redefinition of the role of domestic iconography.

Gisèle Freund, in her early writing on the sociology of photography, argued that a desire for cheap portraiture on the part of the rising middle classes provided a major impetus for the medium's invention. Freund's assertion is given credence by the rapid appearance of portrait studios in major cities of Europe, the United States and, to a lesser extent, Asia and Latin America, between 1840 and 1845. Portraits became yet more common in the decades that followed with the opening of studios in smaller communities as well as the work of itinerant photographers.

From the early years of the medium, the social status of the photographic portrait was assured by the willingness of the rich and powerful to have their photographs taken and circulated. This meant that for the middle and working classes, the photograph represented not simply an inexpensive portrait but rather a democratization of the once exclusive realm of portraiture itself. Moreover, in the mid-nineteenth century home, portraits became essential components of the family's rites of passage. Wedding pictures of the bride, groom and the clergyman who married them were often incorporated in marriage certificates. Graduation photographs of both individuals and classes date from at least 1853. Post-mortem portraiture was commonplace, especially for children, the newly deceased being posed by photographers who specialized in the practice. In some instances, already interned bodies were exhumed because no post-mortem photograph had been taken. By the 1850s, specially coated portraits of the deceased in life or death begin appearing on tombstones.

In other areas as well, the placement of photographs was an essential element in their domestic use. The necessity of shielding daguerreotypes and ambrotypes as well as the small size in which these portraits were usually produced, led to their being kept as keepsakes in ever more elaborate cases and lockets. "Stanhopes," extremely small albumen or collodion transparencies, were embedded in jewelry and viewed through magnifying lenses. Other processes allowed photographs to be transferred onto cloth or ceramics, integrating images of family members into the household's daily life.

From 1854, with André Adolphe-Eugène Disdéri's invention of the *carte-de-visite*, the domestic placement of the photograph lent itself to a more complex social narrative. The cartes, originally images of illustrious figures, were not simply bought and displayed but collected in the albums that, beginning in 1858, Disdéri created for the purpose. When the middle class began sitting for its own *cartes-de-visite* (or tintypes) it was up to the keeper of the album, usually the woman of the house, to integrate family portraits with the images of the figures and institutions to which the family felt an affiliation. Placing royalty, presidents, clergy and the places or monuments associated with them at the front of family albums continued after the mid-1860s with the cabinet cards and the albums designed to hold them. Through the remainder of the nineteenth century, the increasingly ornate designs of family albums made them, in Elizabeth McCauley's description, "the new, positivist Bible...in which all that was admired or held sacred by the family could be preserved and exhibited to friends and visitors."

As was the case with portraiture, the esteem accruing

to the family photographic albums flowed from the highest levels of society. The British Royal family retained the services a group of photographers, known as the photographers to the Queen, to create *carte-de-visites* and cabinet cards to which they added the images of their possessions as well as the cartes and cabinet cards given them by distinguished visitors—an undertaking that would eventually yield 110 albums containing more than 100,000 images. John Mayall's publication of fourteen photographs of the Royal Family in a *carte-de-visite* album in 18602 clearly influenced the Victorian public's demand for family photographic albums of their own.

Queen Victoria and Prince Albert were also responsible for the popularity of the stereoscope, an instrument that, thanks to their endorsement at the Great Exhibition of 1851, quickly became a household item throughout Europe and North America. Between 1854 and 1856, the London Stereoscopic Company sold two million stereoscope viewers—this before Oliver Wendell Holmes designed and placed in the public domain the archetypal nineteenth century stereoscope device. By the early 1860s, the most successful of the British, American and French stereoscope companies were each selling nearly one million stereographs (stereo cards) per year. Before the interest in stereography faded in the early twentieth century, some two to five million different stereograph images would be produced in the United States alone.

Stereographs, like the *carte-de-visites*, tintypes, ambrotypes, cabinet cards and, after the mid-1870s, a new generation of gas and oil powered magic lanterns, brought an ever accelerating profusion of imagery into the nineteenth century home. They also spawned a global industry, as tens of thousands of photographers worked to fill the catalogues of hundreds of suppliers. In 1861, Paris alone supported some 33,000 photographers and other workers in the photography industry.

Among the intellectual leaders of the time, the response to this rapid influx of visual imagery was shaped by the era's deeply held belief in technological progress. Holmes, for instance, in his June 1859 *Atlantic Monthly* article, "The Stereoscope and the Stereograph," called for the creation of stereograph museums as a means of documenting the nineteenth century world. Others advocated the large-scale photography of works of classical art as a means of not only preserving the art but also spreading appreciation of the objects to those who would otherwise never see them. To this end, the Alsatian photographer Adolph Braun, compiled from 1866 on, a catalogue of half a million art works available as *carte-de-visites* and stereographs.

Stereography and magic lanterns also contributed to the creation of the mode of industrialized culture we now know as "entertainment." Increasingly elaborate stereograph and lantern slide sets introduced viewers to the basic strategies of visual storytelling they would see after 1895 in early cinema and well after that in home movies and television.

The net effect of this influx of photography into the nineteenth century home was a coupling of the public and private spheres, as families repeated, through their assembly of images, the acquisitive agenda of the industrial, imperial world. In their albums, boxes and drawers and on their walls, families collected the images of industrial wonders, national landmarks and conquering heroes. They also collected the stereotyped images of non-western peoples and "exotic" locales. Women too were commodified as the first wave of mass produced erotic imagery was brought into the home and locked away for discreet viewing by the patriarch and his confidants—and indeed, as Malek Alloula has demonstrated, Orientalism and erotic photography often complemented one another. Even the photography of classical art proceeded according to the reverence for ancient and Renaissance artistic practices and, conversely, with a deep distrust of contemporary work.

In contrast to the overwhelming influx of commercial imagery into the nineteenth home, the production of domestic photography by family members themselves was a small and slowly evolving practice. William Henry Fox Talbot's conception of photography as a tool for recording one's immediate surroundings was practiced only in a relatively few upper middle class households. However, despite its inaccessibility—and the dangers of working with early photo chemicals—early photography did become an acceptable domestic craft for women, some of whom chose to transcend the pursuit of purely domestic subjects and apply their skills to scientific and artistic goals. Victorian mores also allowed for women to work alongside their husbands in portrait studios and, to a lesser extent, to maintain studios of their own.

Domestic photography advanced slowly with Frederick Scott Archer's invention of collodion, the publication of countless photography manuals and, after 1853, the growth of photographic societies. There also remained the ideal of a more accessible photographic technology, as exemplified by the several failed attempts to simplify the medium, e.g. Adolphe Bertsch's 1860 *chambre noire automatique*, J.B. Spenser and A.J. Melhuish roll paper film in 1854, and the slightly more practical design by Leon Warnecke in 1875. But perhaps the most optimistic gesture in the direction of amateur photography was John Herschel's coining of the term "snapshot" in 1860.

The reality was that for most middle-class families, prior to 1880, amateur photography remained an unaffordable and daunting process. Photographers were required to mix their own chemicals for both taking and developing images, a process that was not only difficult but which also made for inconsistent results. What were

Unknown. Mr. and Mrs. Tennent, Mrs. Yates, Mrs. Brandram.
The Metropolitan Museum of Art, Purchase, The Horace W. Goldsmith Foundation Gift, 1995 (1995.309) Image © The Metropolitan Museum of Art.

regarded as inexpensive cameras were inexpensive only if one expected to recoup their cost by working as a professional photographer.

Technological solutions to these problems began in earnest with Bolton and Sace's development of dry collodion in 1864, followed three years later by Johanna Baptist Obernetter's commercial manufacture of silver chromide paper. In 1878, Charles Bennet described a means of mass producing the gelatin dry plates developed by Richard Maddox eight years before. The result was that, by the early 1880s, it became increasingly possible to take photographs with the assurance of premixed, standardized chemistry.

The demand for mass-produced gelatin dry plates provided a strong incentive for the further development of non-professional photography. Throughout the 1880s, George Eastman and his collaborators (most notably, William H. Walker, F.M. Cossett and Frank Brownell) made what was arguably the most determined effort to develop the mass production of multiple exposure film stock and simplified cameras. From the beginning, Eastman targeted his protect at a potential mass market of amateur photographers (with the deliberately stated inclusion of women and children). His 1888 Kodak camera defined not only consumer photography but also the consumer photographer. In one of the more profound statements of the second industrial revolution, "you take the picture, we do the rest" Eastman separated the photographer from the means of production and from any necessity to understand the process that yielded what was, nevertheless, a personalized object.

It was not until Kodak's 1895 Pocket Model camera or even the appearance of the first Brownie in 1900 that the potential of universally accessible photography was fully realized. But even as these final improvements were made— the introduction of the film cartridge, a better shutter and a much-reduced price— the rise of mass photography was becoming manifest. In 1893, Ernst W. Juhl, founder of the Society for the Advancement of Amateur Photography, organized the first exhibition of amateur photographs at the Hamburg Kunsthalle, an event that showed some six thousand images. Kodak's mushrooming sales as well as those of its many imitators increased to the point where, at the 1900 Exposition

Universelle, Paris, it is estimated that some 17% of visitors arrived with their own "pocket" cameras.

By the turn of the twentieth century, the impact of mass photography was also becoming apparent in the way photographs were stored and presented. The family photographic album was filled with images generated by the family, images that were personal in a way unattainable in the portrait studio and images that would incorporate the family within the same frame in which public sites were depicted. Ornate albums gave way to plainer covers and pages, spaces in which prefabricated imagery was less important than the personalized arrangement of homemade photographs. Thus, while nineteenth century photography began by bringing the visual world into the home, the amateur photographer who appeared at century's end would reverse the process, segregating the public image and creating the iconography of an entirely private domesticity.

RENATE WICKENS-FELDMAN

See also: Daguerreotype; Albumen Print; Carte-de-Visite; Disdéri, André-Adolphe-Eugène; Mayall, John Jabez Edwin; Victoria, Queen and Albert, Prince Consort; Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); London Stereoscopic Company; Holmes, Oliver Wendell; Cabinet Cards; Stereographic Societies; Braun, Adolphe; Talbot, William Henry Fox; Archer, Frederick Scott; Bertsch, Auguste-Adolphe; Melhuish, A.J.; Roll Film; Herschel, Sir John Frederick William; Eastman, George; Kodak; and Expositions Universelle, Paris (1854, 1855, 1867 etc.).

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DONISTHORPE, WORDSWORTH (1847–1914)

Born in the northern industrial city of Leeds, England, in 1847. His father was an inventor. Educated at Cambridge, Wordsworth Donisthorpe became a barrister but didn't practise, becoming instead a political activist.

On 9 November 1876 Donisthorpe applied for a patent for an apparatus "to facilitate the taking of a succession of photographs at equal intervals of time, in order to record the changes taking place in or the movements of the object being photographed, and also by means of a succession of pictures so taken ... to give to the eye a representation of the object in continuous movement...." It is possible that Donisthorpe became interested in the idea of motion pictures while still at University, as his examiner in 1869 was physicist James Clerk Maxwell, whose own improved zoetrope moving image device was revealed that same year.

Donisthorpe's kinesigraph camera was evidently inspired by the "square motion" wool-combing machine designed by his father, with the "falling combs" replaced with falling photographic plates. The camera was built, but how well it worked is not recorded; there appears to have been no demonstration of results. On 24 January 1878, a letter from Donisthorpe, "Talking Photographs," appeared in the British science journal Nature, in which he suggested that his kinesigraph, used in conjunction with Edison's recent invention the phonograph, could produce a talking picture of Prime Minister Gladstone: "the life size photograph itself shall move and gesticulate precisely as he did when making the speech, the words and gestures corresponding as in real life." Each individual photograph was to be illuminated by an electric spark and projected in sequence onto a magic lantern screen. The materials available for photography at that time did not lend themselves to motion picture work, and nothing else is heard from Donisthorpe on this subject until 1889, when he patented a film camera and projector. Another motion picture experimenter, Louis Aimé Augustin Le Prince, was living in Donisthorpe's home town of Leeds at that time, and it may be that word of Le Prince's 1888 experiments revived Donisthorpe's interest in the problem.

The Patent for Donisthorpe's new camera, also called the Kinesigraph, was taken out jointly with his cousin William Carr Crofts. Crofts had a family connection with Charles Darwin—his sister married Charles' son Francis—and Donisthorpe had been at University with Francis. As keen Darwinists it may be that the two in-

ventors saw the machinery of the industrial revolution, specifically the wool-combing machines jointly devised by their fathers, as a legacy that could evolve into a mechanism of the communications revolution—the motion picture camera—ensuring their financial security, and perhaps even useful in promoting their extreme libertarian views.

It was a unique camera mechanism, which again had more in common with textile machinery than with other photographic devices. A shuttle carrying the film moved upwards as the film itself was pulled down, resulting in the film being stationary relative to the lens during each exposure. Development was entrusted to Crofts, a member of the Camera Club which met in central London, and it was perhaps at a Club lecture that he became aware of Eastman celluloid roll film. The new medium was ideal for their camera. Some time between late 1889 and early 1891, Donisthorpe and Crofts set up their kinesigraph in a building overlooking London's Trafalgar Square, and shot at least one short film. It is an evocative, multi-layered view. Foaming water from one of the famous fountains is framed against a sooty background of the domed National Gallery building. Its colonnaded frontage is background to the bustling traffic of pedestrians and horse-drawn omnibuses, the latter bearing bold advertisements for cocoa. Closer, two carriages clip on their way, beneath the triple glass globes of an elaborate gas street lamp. A sequence of nine frames survives in the collection of the National Museum of Photogaphy, Film & Television at Bradford, and a single frame from the same sequence is in the Cinémathèque Française collection.

Donisthorpe and Crofts were among the first experimenters to take photographic sequence pictures with a single-lens camera using a flexible photographic medium. Others included physiological analyst Etienne-Jules Marey, cinema visionary Le Prince, and portrait photographer William Friese-Greene. In America, William Kennedy-Laurie Dickson was working on experiments that would culminate in the Edison kinetoscope. Attempts to solve problems with the Donisthorpe and Crofts projector mechanism continued for months at least, but were unresolvable. Public presentation of their films eluded them. In the meantime, the perforated films of the Edison team had proved a success in a peep-show viewing machine. An arcade featuring Edison kinetoscopes, the first device to commercially exploit motion picture films, opened in London's Regent Street on 17 October 1894. In November W.C. Crofts died, and any hope that might have remained for the eventual success of the kinesigraph project died with him.

Donisthorpe continued his involvement in fringe politics, and wrote books on weights and measures and the poll tax. In his 1898 travel yarn Down the Stream of Civilization—an account of a yachting trip with his chess friend George Newnes (whose company published the book) and two other cronies—an increasingly melancholy Donisthorpe wrote: "Being unable to retrace our steps in Time, we decided to move forward in Space. Shall we never be able to glide back up the stream of Time, and peep into the old home, and gaze on the old faces? Perhaps when the phonograph and the kinesigraph are perfected, and some future worker has solved the problem of colour photography, our descendants will be able to deceive themselves with something very like it: but it will be but a barren husk: a soulless phantasm and nothing more. 'Oh for the touch of a vanished hand, and the sound of a voice that is still!'"

Donisthorpe later assisted his sons in experiments with color and sound motion pictures. His final book Uropa, A New Language was published in 1913.

STEPHEN HERBERT

Biography

Born in Leeds, 24 March 1847. Father George Edmund Donisthorpe, mother Elizabeth Wordsworth. Attended Leeds school, and in 1865 was admitted to Trinity College, Cambridge, where he was a Maths Wrangler and successful at billiards. Visited battlefields of the Franco-Prussian War in 1870. Married Annie Maria Anderson, 1873. In 1876 his first book, Principles of Plutology was published. 1882 founded, with his cousin William Carr Crofts and others, the Liberty and Property Defence League, to promote their Individualist ideas. In 1885 he helped found the British Chess Association, and the British Chess Club. From 1870s experiments with a camera featuring fast-changing glass plates, the invention of photographic moving images was a recurring ambition. With Crofts, in 1889 he patented and had built a film camera. A sequence of Trafalgar Square indicates some success, but they failed to make their projector work. Donisthorpe died at Hindhead, Surrey, on 30 January 1914.

See also: Friese-Greene, William; Edison, Thomas Alva; Le Prince, Augustin; Dickson, William Kennedy-Laurie; and Marey, Etienne Jules.

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DONNÉ, ALFRED (1801–1878)

French photographer and physician

In Théodore Maurisset's caricature of early daguerreotypes, the French physician, Aldred Donné, is believed

to be one of the characters caricatured. Donné was an early portrait photographer as well as a doctor, and the first person to make etchings from daguerreotypes, in 1839—an achievement also featured in Marisset's cartoon.

But it is not only as a photographer that Donné is remembered. He was published widely on a range of medical topics. He identified the component of blood which we now know as 'platelets' in 1842 and was an early advocate of natural breast-feeding. Criticising the widespread practice amongst the Parisian upper class of using 'wet nurses,' and promoting the improved bond between mother and child which natural breastfeeding ensured, he published a pamphlet on the subject in the same year, 1840.

Donné is widely reputed to have taken the earliest datable portrait in Europe—a fact reported in *Spenersche Zeitung* on October 22nd 1839—although the portrait was of poor quality, he was one of the first to publish an account of Daguerre's invention.

A keen microscopist—a subject on which he taught, wrote and published widely—in 1840, working with Léon Foucault, he produced some of the earliest photomicrographs using the daguerreotype process. The images were later published, having been used as the basis for engravings.

John Hannavy

DOWNEY, WILLIAM ERNEST (1829–1915), DANIEL (DIED JULY 1881), & WILLIAM EDWARD (DIED 1909)

William Ernest Downey was the head of W & D Downey of Ebury Street, London, and according to the *British Journal Photographic Almanac* (1916, p. 417) was 'the doyen of British professional photographers.' William Edward Downey was the son of William and Daniel Downey was a partner in the business. The business was dominated by W. E. Downey until his death.

William Ernest Downey was a native of South Shields and started in business on the Tyne. He had, by the time of his death, been a photographer of Royalty for more than forty years and had photographed Queen Victoria in the early 1860s and every subsequent monarch. Downey first attended the Queen at Balmoral and he and his assistants accommodated themselves and their equipment in a labourers cottage on the estate where they were visited by the Prince of Wales with provisions and wine. He had recognised the difficulties they would have being some distance from the Castle. According to obituaries Downey was the possessor of sound business instincts and had been one of the first to recognise the business opportunity presented by the picture postcard over the cabinet card and at the height of the postcard craze was reported to have sold 2½ million cards of a theatrical beauty.

W & D Downey's London studio was first recorded in the London Post Office Directory in 1872 at 61 Ebury Street, it expanded to number 57 from 1879 until 1890). The firm remained at 61 until 1941 when it was last recorded in the directories.

The firm held two Royal warrants. The first was granted as Photographers in Ordinary to Her Majesty on 24 March 1879 and the second, as Photographers to Her Majesty on 7 June 1890. Downey was apparently popular and regularly photographed members of the Royal family, notably at Balmoral and Frogmore for the Prince of Wales throughout the late 1860s. Their carte-de-visite portrait of the Princess of Wales with Princess Louise being carried on her back was one of the most popular ever issued with sales of over 300,000. In the 1897 the firm produced the Queen's official Diamond Jubilee portrait.

W. Downey's son, a partner in the assoiciated firm of J. J. & F. Downey of South Shields received a command to go to Balmoral in 1897 and took along a newly completed cinematographic camera designed by a 'valued assistant' in the firm Mr T. J. Harrison. The film of Queen and other members of the Royal family was projected at Windsor Castle on 23 November with father and son Downey in attendance. The film was subsequently exhibited by J & F Downey in South Shields and elsewhere. It was the first film ever taken of the Royal family The company gained a favoured position to taking moving pictures of the 1897 Queen's Diamond Jubilee procession in London.

Even by 1910 the firm was still being called upon to produce formal portraits and it photographed nine European sovereigns at Windsor for the funeral of King Edward VII. According to Downey interviewed in *The Lady's Pictorial Supplement* of 5 December 1896 Queen Victoria was the greatest patroness photography had ever had. The possibility of photographs fading had made her insist upon portrait photographs being printed in carbon and platinotype, while special photographs had to be enamelled. Downey also reported that she was an excellent sitter aiding the photographer as much as possible to achieve the required effect.

Royal patronage undoubtedly assisted the firm which grew to be one of the premier society photographers of the late nineteenth century. Their location in London was important in attracting aristocracy, politicians, military men, learned men and women and later on celebrities of the day. Between 1890 and 1894 the publishers Cassell & Co produced The Cabinet Portrait Gallery in five volumes illustrated from original photographs by W & D Downey and their photographs were widely used in commemorative books such as *The Royal Visit to Wolverhampton* (1867) and as frontispieces in, for

Downey, W. and D. Sarah Bernhardt the as Empress Theodora in Sardou's "Theodora."
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

example, *Jottings… from the diary of Amelia, Countess and Heiress of Derwentwater* (1869) which featured a portait of the author.

The *Illustrated London News* from at least 1865 made engravings from photographs credited to the Downey studio as did other periodicals up to and beyond 1900. According to Downey they never published a portrait without the full consent of the sitter. Between April 1883 and April 1890 the firm registered over 230 portraits of Royalty and celebrities at Stationer's Hall.

H. Baden Pritchard in his series of reports of commercial photographic premises published in the *Photographic News* during the 1870s and 1880s and collected together in *The Photographic Studios of Europe* (1882) reported on Downey's London studio and their general business methods. The report allayed some of the exclusivity attached to the firm: "Some people may suppose that the Messrs Downey reserve to themselves the right of photographing titled personages; this is a mistake. A circular published by them certainly conveys the idea that 'anybody, as calls himself anybody,' must perforce be portrayed by the famous Newcastle firm which has now established itself in the neighbourhood of Buckingham Palace." The firm charged one guinea for one pose with additional fees for additional positions, which brought the charges into line with contemporary firms. Cartes were one guinea per dozen.

The firm occupied 'two modest little houses in Ebury Street' with showrooms on the ground floor and studios and dressing rooms up a short flight of steps. Number 61 Ebury Street had two studios and number 57 one glass room 42 × 14 feet which by 1882 had just been completed. Most of the Downey's printing was done in Newcastle where a new studio and premises had been opened in 1864. This was also where all the pictures for publication were mounted and finished. The firm had additional premises at 10 Nevern Square, Earls Court, London which may have been used for printing and finishing prints.

A collection of Downey's court and social work from the early 1860s to 1920s is held by the Hulton Archive (www.getty-images.com) and National Portrait Gallery in London have holdings of the Downey studio work.

MICHAEL PRITCHARD

See also: Carte-de-Visite; and Platinotype Co. (Willis & Clements).

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DRAPER, JOHN WILLIAM (1811–1882)
English-born chemist and photographer

John William Draper was born in England in 1811, and died in 1882 in New York. After emigrating to America he earned a M.D. at the University of Pennsylvania and in 1839 was hired at New York University to teach chemistry. Draper's early work in photochemistry makes him the most important American precursor of photography. Draper realized, ahead of most, that the photographically active spectrum (blue-violet) did not match the visual spectrum, and therefore that the photographic focus would differ from the optical one. He also deduced a fixing solution from an early paper of John Herschel's on hyposulphites. When the daguerreotype process was made public in New York, in September 1839, he started experimenting, and by the end of the

year obtained satisfactory portraits. His 1840 portrait of his sister is considered one of the oldest in existence. In early 1840 Draper teamed up with painter-inventor Samuel Morse, creating a portrait studio on the roof of New York University. He was also the first American, in 1840, to photograph the moon. In later years, Draper left practical photography for theoretical studies on light, photochemistry, and spectrum analysis, a field in which he was seconded and eventually succeeded by his son Henry; he also wrote on intellectual history and American history.

François Brunet

DRY PLATE NEGATIVES: GELATINE

The 1871 paper by Richard Leach Maddox "An Experiment with Gelatino-Bromide" (Maddox, 1871, 422) is generally seen as the event that led to the introduction of fast gelatine dry plates. However, it made little immediate impact on contemporary photographers. In the search for what seemed like the Holy Grail of photography—dry plates that matched the qualities of wet collodion plates—the announcement of promising dry processes that ultimately disappointed had become a regular feature of the photographic press. Gelatine as a substitute for collodion was well known to photographers and at least two workers, W.H. Harrison and Thomas Sutton, had recognised the potential of gelatine bromide emulsions. And as Maddox himself recalled, his paper was "hurriedly written and fragmentary" and "compared with collodion, the gelatine was slower" (W.J. Harrison, 1888, 131–132). Almost two years passed before it emerged that Maddox's paper had not gone completely unnoticed.

In July 1873 John Burgess, a London Photographer, advertised a bottled emulsion which enabled a photographer to "prepare dry plates equal in sensitiveness and superior in many respects to the best wet plates" (W.J. Harrison, 1888, 63). Burgess did not disclose the nature of his emulsion but it was soon revealed to be gelatine bromide. Although it received an early welcome from the photographic press, it was found to decompose readily and exposure times did not match those of wet collodion. It was not a commercial success. Undaunted, Burgess soon offered pre-coated dry plates for sale. They too were imperfect and a market failure but did impress some photographers. In a glimpse of the future, John Beattie reported in *Photographic News* how he thought they could be useful to "a professional artist who may be called from home to photograph some special domestic occurrence, such as the first family wedding;" (Beattie, 1873, 526).

Some of the problems with Burgess's emulsion was caused by a build-up of soluble salts, which could by remedied by a washing-out process independently advocated in November 1873 by Joshua King and J. Johnston. Richard Kennett claimed an earlier interest in gelatine emulsions was revived when Burgess announced his products. (Kennett, 1874, 290–292). On 20th November 1873 Kennett patented a dried gelatine silver bromide emulsion, which he called a pellicle. When marketed, the user was directed to dissolve the pellicle in water and warm before pouring onto a glass plate. Kennett's pellicle received a mixed reception from photographers. There were enthusiastic advocates who claimed the process to be superior to other dry processes and wet collodion but also many sceptics. Ultimately, neither the pellicle nor the prepared plates Kennett later introduced were a commercial success. Of the pellicle, John Werge claimed "It gave excellent results, but preparing the plates was a messy and sticky operation, which I feared would be prejudicial to its usefulness and success." (Werge 1890, 96). It also seems that most photographers could not come to terms with the sensitivity of Kennett's emulsion and regularly over-exposed.

Despite the market failure of the products outlined above, refinements, such as W.B. Bolton's incremental method of adding gelatine, J. Johnston's use of ammonia and Charles Bennett's hot ripening technique, led to improved plates of more consistent quality. Most importantly, exposure times measured in fractions of seconds were now possible. Further commercial exploitation became inevitable. The first business to produce dry plates in large quantities was the Liverpool Dry Plate Company established in the1860s to market Tannin plates and later, collodio-bromide plates. In 1876 it introduced Kennett's gelatine plates and in 1878, Bennett's more sensitive plates. The business was not outstandingly successful but it showed the way. In 1879, when Alfred Harmen set up his Britannia Works Company to manufacture dry plates there were over twenty brands of pre-prepared dry plates on the market. Alfred Harmen's business began with staff coating plates by hand with emulsion from a teapot. Within a few years dry plate companies had introduced machines coating 12,000 plates a day. By 1891 Alfred Harmen's company was claiming to be the largest manufacturer of dry plates in the world. Ten years later it adopted the name that was to become one of the most famous in photography, Ilford, Limited.

The development of gelatine dry plates was primarily a British concern. Most early users were amateurs; professional photographers were complacent and conservative. Werge described how in 1878 he visited Messrs. Elliot and Fry to promote rapid gelatine dry plates but was mockingly accused by an incredulous Fry of being "an enthusiast." (Werge, 1890, 96–7). It was only in the 1880s that professional photographers began using gelatine dry plates in large numbers. Even then, one writer visiting Messrs. Window and Grove found them using gelatine during the dark winter months but was

told by Grove " I shall get back to wet collodion when I can" (Pritchard, 1883, 93).

If gelatine dry plates simplified photography in many ways, they also presented new problems. H. P. Robinson echoed widespread complaints when writing about the variation and lack of standardisation of mass-produced plates. "One maker's '30 times' is quicker than another's '40 times'" (Robinson 1888. 6). Plate speeds expressed in arbitrary wet collodion equivalents favoured by some was clearly unsatisfactory. Scientific intervention was the answer. The first practicable device for measuring film speed was Leon Warnerke's sensitometer of 1880 but more important was the work undertaken by Ferdinand Hurter and Vero Driffield. By establishing the basics of sensitometry during the 1880s and 1890s, they were able to determine numerical values to represent the speed of an emulsion. Although manufacturers were slow to make use of scientific development the first steps towards standardisation had been made. Exposure tables and calculators began to become available and by the 1890s exposure meters were being widely sold.

The introduction of reliable fast dry emulsions had an enormous impact and marks the beginnings of modern photography. Its consequences included the introduction of hand cameras, roll film and moving pictures. Vast numbers of newcomers were brought into photography and new styles of picture making emerged. Emulsion manufacturers added processing and printing to their interests and a giant new industry was created. By 1900, photography had undergone an industrial revolution.

JOHN WARD

See also: Wet Collodion Negative ; Wet Collodion Positive Processes; Emulsions Bromide Print; Elliott, Joseph John & Fry, Clarence Edmund; and Sensitometry and Densitometry.

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DRY PLATE NEGATIVES: NON-GELATINE

In his colourful account of 19th century photography, John Werge claimed that wet collodion photography "was barely a workable process when it became the anxiety of every amateur to have a *dry* collodion process…. Hence the number of Dry Plate processes published about this period and the controversies carried on by the many enthusiastic champions of the various methods. Beer was pitted against tea and coffee, honey against albumen, gin against rum, but none of them were equal to wet collodion"(Werge 1890, 77). The great advantage of the wet collodion process was that a competent practitioner could be relied on to produce consistent results with exposures of a few seconds. The major disadvantage was that wet plates had to be prepared, exposed and processed immediately, thus photography in the field usually required a cart or van to transport the bulky equipment, chemicals and water. For the amateur, short exposures and consistent results were not always a necessity but pre-prepared plates, convenience and mobility were. As one writer noted, "The inconveniences inherent in the in the employment of wet-collodion in out-of-door operations are so numerous, as to render its use almost impossible" (Collard 1858, 75).

Although all the pioneers experimented with methods of depositing silver salts in a dry medium onto glass plates, the first widely practised dry plate process was that announced in France in 1847 by Niepce de Saint-Victor. Albumen was used as the binding agent to hold the sensitised silver salts to a glass plate. Albumen plates produced high quality negatives and were widely used by landscape photographers throughout Europe. However, exposure times were long and, according to Thomas Sutton, the manipulations were "too difficult for the amateur" (Sutton 1862, 75).

During the 1850s and 1860s several dry collodion processes were proposed. Marc Gaudin's methods of 1854 proved to be unsatisfactory and the collodion-honey processes of George Shadboldt and Maxwell

Lyte barely practicable. More useful was the collodio-albumen process published in 1855 by the French scientist, J.M.Taupenot. The process involved washing wet collodion plates in a silver nitrate bath. After coating with a protective layer of albumen, the dried plates could be stored. Another silver bath a few hours before they were needed sensitised the plates and after drying they were ready for use. Taupenot's process formed the basis of several similar processes. Particularly popular in England were those by Thomas Fothergill and Joseph Sidebotham. In 1856 Richard Hill Norris patented a process where a collodion plate was coated with gelatine or gum arabic to preserve its sensitivity. Norris dry plates were introduced commercially and sold widely. Another popular dry collodion technique was the tannin process introduced by Major C. Russell in 1861. The sensitised collodion plate was washed before applying a tannin solution and drying. It was much favoured by English amateurs because it was simple and reliable. In 1864 W.E. Bolton and E.J. Sayce announced an important development, a process which involved mixing silver bromide into collodion forming an emulsion. This was the first practicable photographic emulsion.

With the processes described above, dry sensitised plates could be produced which were relatively stable and in the case of collodio-bromide emulsions had a degree of consistency and reliability. It is also clear that negatives could be made that matched the best made from wet collodion. But what publications of the period do show is that for most photographers, dry collodion plates could not match the speed of wet plates. Using collodio-albumen, one popular handbook suggested exposures "about double the time required for wet collodion negatives" (Cox 1857, 26). A *Photographic News* contributor similarly reported "experience has shown me that dry collodion is two or three times less sensitive than the wet collodion;" (Collard 1858, 75). Comparative tests by the Manchester Photographic Society in 1858 confirmed these views. The Taupenot process was considered "the best dry process yet discovered…" but it pronounced that "The exposure required is moderate; pictures may be taken with an exposure of 15 seconds and upwards." Fothergill's variation was considered inferior and the Hill Norris gelatine process was said to require exposures "at least double that of the collodio-albumen (*Photographic News,* 1858, 117). Russell's Tannin Process, if anything, normally required longer exposures. Sutton claimed "about four minutes for a sun-lighted view…" (Sutton, 1862, 88), while H.C. Jennings suggested three minutes (Jennings, 1863, 577). Contemporary commentators also agreed that while the Bolton and Sayce emulsion plates kept particularly well, they were slower than wet collodion. Jerome Harrison suggested 15 seconds as the average exposure (Harrison 1888, 127).

A few photographers however, claimed results with dry plates that matched the so-called `instantaneous photographs,' made by the likes of George Washington Wilson and Valentine Blanchard using wet collodion. In 1862 Sutton published details of a `rapid dry process' based on the tannin process, which he claimed "had been known to Dr. Hill Norris for upwards of two years" (Sutton 1862, 106). There seems little doubt that `instantaneous' pictures were obtained using dry collodion processes but short exposures with dry collodion probably required considerable skill and a great deal of luck. A *Photographic News* review of a Sutton pamphlet confirms seeing "excellent pictures with very rapid exposures" but also writes of "utter and disgusting failures." It bemoaned the fact that the majority of photographers failed and groped towards explanations (1864, 266). Part of the answer was that too many dry processes incorporated the impure kitchen consumables alluded to by Werge. They were added as preservatives or sensitisers but their chemical composition was wildly variable and their action imperfectly understood.

The American, Carey Lea, rightly observed "it is not random experimenting that does good—not publishing that a few plates have been obtained by this or that preservative. Useful experimenting must be systematic and comparative" (Carey Lea, 1868, 504). At the end of the 1860s, most dry plate practitioners were amateurs while their professional colleagues relied almost entirely on wet collodion. More than a decade was to pass before all photographers began using the same sensitive materials.

JOHN WARD

See also: Bolton and Sayce; Harrison, Jerome; Lea, Cary; Lyte, Maxwell; Niépce de Saint-Victor, Claude Félix Abel; Shadbolt, George; Sidebotham, Joseph; Sutton, Thomas; and Werge, John.

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DU CAMP, MAXIME (1822–1894)
French photographer and writer

Du Camp was born in Paris on 2 February 1822, the only child of wealthy aristocrats. His father, Théodore-Joseph, a surgeon, died a year after Du Camp's birth and his mother, Alexandrine, when Du Camp was fifteen. He departed on his one and only photographic excursion to Egypt and the Near East not long after the Revolution of 1848 in which he was wounded and awarded the Medal of the Legion of Honor. Just before he set sail in 1849, his last remaining relative, a grandmother, died. Du Camp wrote of the deaths in his family as determining the course of his life, especially that of his mother. She mother became "that gentle ghost … [who] followed me on my travels, became a part of my intimate existence, my work, even my pleasures." (*Souvenirs littéraires*, (Recollections of a Literary Life), Paris: Aubier, 1994, 139) Indeed, Du Camp remained a lifelong bachelor despite several amorous liasons.

Du Camp's obsession with death was also nurtured by having come of age at the end of the Romantic movement. "Never had death been more loved," wrote Du Camp. "The generation of artists and writers that preceded me, to which I belonged, suffered … an abstract sorrow, inherent to their being or to their epoch." (*Souvenirs littéraires*, 156–157). In his teens Du Camp gorged himself on Romantic literature, especially the poems and novels of his idol, Victor Hugo.

Like many youths of his generation, Du Camp was swept up by a wave of Orientalism focused on Egypt in particular as the site of an extinct culture often described as "the cradle of Western civilization." It was upon the realization of his dream of going to Egypt that Du Camp took up photography, but not as a means of personal expression. For him the camera was "an instrument of precision … which would allow me exact reconstructions." Along with Du Camp's youthful romantic leanings was an obsession, perhaps also influenced by familial losses, with detailed and exact

Du Camp, Maxime. Westernmost Colossus of the Temple of Re.
The Metropolitan Museum of Art, Gilman Collection, Gift of The Howard Gilman Foundation, 2005 (2005.100.376.149) Image © The Metropolitan Museum of Art.

documentation of places, persons, and events. It was this aspect of his personality, together with a driving ambition to make a name for himself, which led him to the take on the new medium. As the practical opportunist that facts and contemporary accounts reveal him to have been, he prepared extensively for this trip in other ways as well. He read widely among ancient and contemporary works, copying long extracts in his even, cramped script. He procured an official mission from the Ministry of Public Education as well as membership in the scholarly Société orientale [Oriental Society], all with the promise that he would bring back abundant documentation. He studied photography with Gustave Le Grey but had little success with his method and switched to the wet waxed paper negative process of Blanquart-Evrard that he learned from Alexis Delagrange en route. Once launched Du Camp photographed with a vengeance throughout the entire length of Egypt from Alexandria to the second cataract. His good friend and traveling companion Gustave Flaubert commented, "I don't know how Maxime hasn't killed himself with this raging mania for photography" (Letter to his mother, 15 April 1850). Du Camp also kept copious notes and

made papier maché impressions of wall carvings and hieroglyphs. After leaving Egypt for Palestine and Syria his production tapered off considerably.

Du Camp's photographs, all of monuments, reflect his working purpose and follow the pattern of earlier documentary etchings and lithographs, especially those in the 24 volumes of the Napoleonic *Description de l'Egypt* [Description of Egypt] (1809–1828). Du Camp moves from a distant overall view to a closer one, at times honing in on a detail or two, always positioning his subject in the center of the frame. The overall effect is straightforward and banal. The poor quality of the photographs printed by Du Camp himself also indicate a lack of concern for aesthetics. The one original aspect of his work is his use of a Nubian man, ostensibly as a measure of scale, but who is often almost invisible, posed in odd nooks and crannies of the ancient tombs and temples.

Upon his return in 1851 Du Camp showed his photographs to the newly founded Société Heliographique and that September Francis Wey published an extensive celebratory review in *La Lumière* [The Light]. Du Camp's efforts resulted in the first travel album of its kind, *Egypte, Nubie, Palestine et Syrie*. Published in May 1852 by Blanquart-Evrard in an edition of approximately 200 large leather-bound copies, it contains 125 photographs and a lengthy introduction. Elegant and costly, the album was partially funded by individual and government subscriptions. Photographs were also sold separately and occasionally exhibited, as in 1855 at the Exposition Universelle in Paris where they garnered a Second Class medal.

Despite his success Du Camp subsequently abandoned photography completely to devote himself to what became a prodigious literary production. He had already published *Souvenirs et paysages d'Orient* [Oriental Recollections and Landscapes] (1848), an account of an 1844 trip to Greece, Constantinople, and Algeria. Two subsequent books are directly related to his photographic trip, an autobiographical fiction, *Memoires d'un suicidé* [Memoirs of a Suicide] (1853) and a travel account, *Le Nil* [The Nile] (1854), as well as a short story, "L'Ennuque Noir" [The Black Eunuch]. In addition, during the 1850s and 1860s, Du Camp published poems, reviews of art exhibitions, and was a founder of the literary journal *Revue de Paris* (1851-1858). Later he turned his attention to the documentation of his native city and its political upheavals. He devoted nine years (1866–1875) to his most ambitious documentary enterprise, a six-volume account of the functioning of Paris, its food supplies, transportation systems, prisons, and so forth. He was admitted to the prestigious Academie Française in 1880, fourteen years before his death in Baden-Baden on 8 February 1894.

Du Camp's voluminous archives, including correspondence, manuscripts, negatives and unpublished photographs are in the Bibliothèque de l'Institut de France in Paris. Copies of his album can be found in several major institutions such as the Bibliothèque National in Paris and the Metropolitan Museum in New York. Individual prints are in numerous public and private collections. His work is highly regarded, primarily for its pioneering status, having had little direct stylistic influence on subsequent photographers.

JULIA BALLERINI

Biography

Maxime Du Camp was born of aristocratic parents in Paris on 2 February 1822. He learned photography in preparation for a trip with Gustave Flaubert to the Near East in 1849–1851 and produced the first major travel album of its kind, *Egypte, Nubie, Palestine et Syrie* (1852). Subsequently Du Camp abandoned photography to devote himself to his activities as a writer. Two books published in the 1850s, an autobiography and a travel narrative, are related to his photographic trip. Du Camp also published poems, reviews of art exhibitions, and was a founder of the literary journal *Revue de Paris* (1851–1858). Later in life he turned his attention to the documentation of his native city and its political upheavals, his most ambitious enterprise being a six-volume account of the workings of Paris, from sewers to summits. He was admitted to the Academie Française in 1880. Forever a bachelor, he died in Baden-Baden on 8 February 1894.

See also: Le Grey, Gustave; De la Grange, Baron Alexis; Wey, Francis; Société Héliographique Française; Blanquart-Evrard, Louis-Désiré; Expositions Universelle, Paris (1854, 1855, 1867 etc.); and Bibliothèque National.

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DUBOIS DE NEHAUT, CHEVALIER LOUIS-PIERRE-THEOPHILE (1799–1872)

Franco-Belgian proto-reportage photographer

Louis Pierre Théophile Dubois de Nehaut was born in Douai, in northern France, on 10 August 1799. His family seat and main residence was the château at Auby, six kilometres from Douai. Dubois was a magistrate by profession, judge at the tribunal of first instance in Lille until revolution broke out in France in 1848. For bravery in upholding law and order in the face of personal danger, when his actions contributed to preventing the uprising spilling over the border into Belgium, Dubois was appointed a knight of the Order of Leopold.

On 2 December 1851, the very day that the future emperor Napoleon III carried out his coup d'état, Dubois registered his residence in Brussels. It is probable that Dubois preferred to pursue his business interests in Belgium rather than attempt to exercise his profession in a France grown politically uncongenial. In any event, Dubois arrived alone: his wife Louise Victoire Costeau de Semarcourt, remained in Paris. Dubois rented an apartment at 7 Place de Cologne, intending to stay a fortnight. He would live there for nearly twenty years, only moving next door to number 9 on 11 March 1871.

He was a committed collodion photographer by May 1854, when he made full-plate views in Constantinople. On another journey to Spain, many of his plates broke in transit, although a series of portraits of Basques dressed in native costume did survive the trip. On a return visit to France, he made studies of a country house and its grounds, presumably his family seat at Auby. While comfortable with traditional portraiture and landscape work, Dubois' preferred subject matter lay elsewhere: it was as a pioneer of photographic reportage that Dubois would gain his reputation, posthumously consolidated, as the most talented and inventive practitioner active in Belgium in the 1850s.

By 1854, Dubois felt confident enough of the results he was achieving to put together a personal album *Promenade aux environs de la place de Cologne à Bruxelles* [Stroll around and about the Place de Cologne in Brussels], the prints in which are accompanied by captions which show Dubois as an amusing but conscientious commentator on his own work. Two views of "La place pendant les fêtes de septembre" [The square during the September festivities] are early attempts to capture a public event 'on the wing,' as Dubois pushes the generally sluggish collodion process to its technical limits; he manages to keep the blurring of people and traffic to a minimum by the use of a high vantage point, a technique he would exploit in his later work. Taking the camera futher afield, an image of Mechelen railway station, capturing motion under extreme lighting conditions, is captioned "Epreuve instantanée au passage d'un train au soleil couchant. Ciel d'orage 1854" [Snapshot of a passing train at sunset. Stormy sky 1854]. Another print of Dubois with the stationmaster pays

de Nehaut, Louis-Pierre-Théophile Dubois. Another Impossible Task. *The Metropolitan Museum of Art, Gilman Collection, Gift of The Howard Gilman Foundation, 2005 (2005.100.372.32) Image © The Metropolitan Museum of Art.*

tribute to his manservant Jean Maertens (born 1832) for acting as operator and for transporting the cumbersome equipment.

Some of Dubois' finest earlier images feature in a series documenting the Brussels zoo, opened in 1851. The animal studies confirm his primary preoccupation with capturing movement and comprise a number of repeated exercises in achieved immediacy. The most appealing is a portrait of the Indian elephant Miss Betzy performing a trick with her keeper. Captioned "Encore un impossible à faire. 12ème glace" [Another impossible feat. 12th plate], it records Dubois' tenacity in the teeth of improbable odds.

Dubois' unquestionable masterpiece is his photoreportage of the silver jubilee celebrations held in Brussels for Leopold I, king of the Belgians. Over a period of three days in July 1856, Dubois recorded the highspots of this outpouring of patriotic fervour, including processions, an open air thanksgiving ceremony, and the inauguration of commemorative fountains. Assisted by fellow member of the Société française de Photographie Baron Humbert de Molard (Dubois had been a member since October 1855), Dubois and his team took about sixty negatives, of which two-thirds gave successful prints. Dubois' "Les Fêtes de Juillet" [July Festivities] were a tour-de-force of planning as well as execution. Dubois used his influence with the authorities to gain direct access to the royal party, setting up a battery of cameras along the route of the various manifestations. The presence of Dubois' team attracted its fair share of popular and journalistic attention, with Dubois himself cutting a Pickwickian figure in a broad-brimmed hat which he would employ as a camera shutter. The photoreportage earned Dubois a medal at the 1856 Brussels photographic exhibition, but otherwise contemporary reaction was surprisingly muted. Dubois' vision was perhaps simply too radical, thereby failing to chime with the prevailing aesthetic. That the unposed images were indeed considered insufficiently "artistic" to contemporary taste, is something Humbert de Molard himself admitted in a report on the Brussels exhibition (*Bulletin de la Société française de Photographie*, 2, 1856: 280). Dubois, as an amateur, felt no pressing need publish the series, which received only limited dissemination in the form of a handful of presentation albums.

Dubois' next major photoreportage was a review of the Imperial Guard in the newly redesigned Bois de Boulogne in June 1857. It shared characteristics with the Jubilee series, both royal occasions offering set-piece opportunities to capture organised masses in the open air. Dubois sub-titled the series of thirty prints "Etudes de photographie rapide dans toutes les conditions de lumière" [Studies of rapid photography in all light conditions]. Dubois' final major series was a departure from his usual subject matter. "Les Trésors de l'art ancien dans les Flandres" [Treasures of ancient art in Flanders] covers territory more readily associated with Edmond Fierlants. In fact, the two of them photographed the Memlings at St John's Hospice in Bruges simultaneously. Dubois' genial nature was expressed in his offer to donate some of his profits to the hospice, and in his self-portrait with the hospice nuns. This series of art reproductions, totalling 70 plates, was published in early 1859. Sold as individual prints, it is the only series which Dubois is known to have commercialised.

Although Dubois continued to photograph into the 1860s, using smaller format and stereo cameras, including a notable series of Antwerp street scenes, like many of his contemporaries in the Société française de Photographie, his enthusiasm seems to have waned as these leisured pioneers gave way to a new generation of workaday professionals and entrepreneurs. Chevalier Dubois de Nehaut died on 21 September 1872 in Brussels.

The Bibliothèque royale Albert Ier—Cabinet des estampes, Brussels, holds copyright copies of "Les Fêtes de Juillet" and "Les Trésors de l'art ancien dans les Flandres," and the Bibliothèque nationale de France —Département des estampes et de la photographie a copy of "Revue de la Garde du Bois de Boulogne." The Gilman Paper Company Collection owns the series *Promenade aux environs de la place de Cologne à Bruxelles,* including the reportage on the Brussels zoo.

STEVEN F. JOSEPH

Biography

Louis Pierre Théophile Dubois de Nehaut was born in Douai, in northern France, on 10 August 1799. His family seat and main residence was the château at Auby, near Douai. Dubois was a magistrate by profession, judge at the tribunal of first instance in Lille. On 2 December 1851, Dubois moved to Brussels, his wife Louise Victoire Costeau de Semarcourt remaining in Paris. Dubois rented an apartment at 7 Place de Cologne (renamed Place des Nations, the present-day Place Rogier), intending to stay a fortnight. He would live there for nearly twenty years, moving next door to number 9 on 11 March 1871. Dubois was a pioneer of photographic reportage, and undoubtedly the most talented and inventive practitioner active in Belgium in the 1850s. His masterpiece is a series of about forty images recording the silver jubilee celebrations held in Brussels for King Leopold I in July 1856. Chevalier Dubois de Nehaut died on 21 September 1872 in Brussels, survived by his separated wife.

See also: Société Française de Photographie; Humbert de Molard, Baron Louis-Adolphe; and Fierlants, Edmond.

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DUBOSCQ, LOUIS JULES (1817–1886)

French optical and photographic equipment manufacturer. Born at Villennes, northern France in 1817, Jules Duboscq was apprenticed in May 1834 to the Parisian optician Jean-Baptiste François Soleil, who had inherited the business from his father François. In 1839 Duboscq married one of J.B.F. Soleil's daughters. Soleil's workshops were at 30 rue Monsieur-le-Prince. The public store was at 35 (later 21) rue de l'Odeon, and stock included lantern slides, anorthoscopes (instruments for displaying image distortion effects), as well as oxy-hydrogen limelight, and electrical illuminants. When J.B.F. Soleil retired in 1849, Duboscq took over the instrument workshop; the workshop for lenses was run by Soleil's son Henri.

From 1849 Duboscq produced optical effects—sunrise, a rainbow—at the Paris Opera, by means of an electrical arc lamp. At a time when screen projection was taking on considerable significance in scientific and lecturing circles, with the introduction of photographic slides and projection of scientific experiments, Duboscq was producing important projection apparatus. The 'Lanterne Photogénique' of 1850 featured a carbon arc with electrical regulator, designed by Léon Foucault and improved by Duboscq. This was a very early use of electricity as an optical lantern illuminant, which was chiefly used for microscopic projection, demonstrations of polarisation and of the spectrum.

Duboscq made and offered for sale a number of different models of projecting phenakistiscopes, with short cyclic motion sequences featuring images based on designs used with the familiar viewing device for opaque cardboard discs. With Duboscq's novel mechanism placed in front of an optical lantern the color sequences, painted in translucent colors on glass, could now be seen in motion on the screen.

Following Charles Wheatstone's invention of the stereoscope David Brewster devised a box-form version, but was unable to interest any of the British instrument makers in manufacturing stereoscopes to his design. In 1850 while visiting Paris, Brewster was introduced to Duboscq by the Abbé Moigno, an advocate for educational uses of new optical methods. Brewster showed the instrument to Duboscq, and the firm began manufacturing the stereoscope, developing several models incorporating improvements.

Duboscq also provided daguerreotype views for these stereoscopes, initially taking two exposures sequentially with a single camera moved horizontally between exposures. The stereoscope became immensely popular following the Great Exhibition of 1851 at the Crystal Palace in London, where Queen Victoria reportedly enjoyed the device and, according to some sources, was presented with a Duboscq stereoscope. He was soon able to offer stereoviews on daguerreotype plates, glass, and paper. Lists included busts of notable public figures, statues, and natural history. A small number of outdoor views by Claude Marie Ferrier comprise the earliest stereoscopic images of Paris. Duboscq patented the device in February 1852, French patent no. 13,069; with no mention of Wheatstone or Brewster. (But with an 1857 lawsuit, Duboscq lost his monopoly for the stereosope). Historian Paolo Brenni considers that Duboscq is today "considered a real master of early photographic still life."

In an addition to the stereoscope patent, Duboscq mentioned the Stereo-Fantascope or Bioscope, a viewer for showing animated stereoscopic photographs. Twelve or more pairs of photographic images were placed around a cardboard disc, the images of each pair arranged one above the other. The pictures could be viewed through two small angled mirrors. Duboscq advertised several models of his 'Bioscope' device, but the fact that no example is known to exist indicates very limited sales. The only known example of a surviving Bioscope disc came to light in the 1990s, and is in the Museum of the History of Science, University of Ghent, Belgium. It features sequential albumen photographs of a steam engine. The prominent French physicist Jules Antoine Lissajous stated: 'This apparatus which is particularly remarkable because it represents the solution to a difficult problem has, unfortunately, no chance of being sold in quantity, since the number of the pictures needed is very considerable: not less than 32 pictures [actually 24] are required.' Ironically, the eventual success of sequential motion pictures would, of course,

require many hundreds of photographs to achieve even a monoscopic result.

Duboscq's 1853 book *Règles pratiques pour la photographie* [Practical Rules for Photography[includes details of his various types of apparatus. In July 1854 he gave a lantern demonstration at the famous Royal Polytechnic Institution in London, well-known as a venue for public demonstrations of new developments in the image projection field. Duboscq devised an early version of the vertical projector—known today as the overhead projector—for the projection of objects which could only be placed in a horizontal position. Duboscq's prismatic model was demonstrated in the 1860s, and took the form of a separate attachment to be used with any lantern.

Other photographic advances included improvements to collodion plates, and an 1861 idea, the polychronograph camera attachment for producing a large number of small pictures on a single plate. Duboscq also made René Dagron's equipment for producing and projecting microphotographs, including early 'microfilm' (gelatine-based microphotographs) used during the 1870 Seige of Paris.

In July 1879 Duboscq, with his nephew and son-in-law Albert Alexis Duboscq, formed the business into a short-lived company. In July 1885 he formed another company with engineer Philibért-François Pellin. Duboscq died in 1886. Pellin and his son Félix Marie continued the tradition of high quality optical work well into the 20th century.

STEPHEN HERBERT

Biography

Louis Jules Duboscq was born at Villennes (Seine-et-Oise), northern France, March 5, 1817. His father was a cobbler. After marrying (in 1839) Rosalie Jeanne Josephine Soleil, one of the daughters of his employer J.B.F. Soleil, Louis Jules Duboscq became an integral part of the firm, and eventually took over a major part of the business. Certainly one of the most talented and respected optical instrument makers of the 19th century, Duboscq's instruments were to be found in laboratories and cabinets throughout Europe. His brother Theodore was for many years the firm's technical director. An Officer of the Legion of Honour, Duboscq died September 24, 1886. A photographic portrait, and a useful Soleil-Duboscq family tree, appear in the comprehensive article *19th Century French Scientific Instrument Makers. XIII: Soleil, Duboscq, and Their Successors.*

See also: Wheatstone, Charles; Brewster, Sir David; Stereoscopy; Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); and Leon, Moyse & Levy, Issac, Ferrier, Claude-Marie, and Charles Soulier; and Moigno, Abbe.

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DUCHENNE, GUILLAUME-BENJAMIN-AMANT (1806–1875)

French electrophysiologist

The great achievement of Guillaume-Benjamin-Armand Duchenne was to bring together three of the most important developments of the nineteenth century: electricity, physiology, and photography. Duchenne's photography also embraced medicine and neurology, evolution, physiognomic typology, and the education of artists.

Descended from generations of seafarers, Duchenne took up medical studies in Paris in 1836, practiced in his natal town Boulogne-sur-Mer from 1831, and returned to Paris in 1842. An outstanding neurologist and diagnostician who specialized in the application of electricity to the body as a method of neurological investigation and therapy, Duchenne had no official hospital position. Yet he was welcome at the important Paris hospitals, his experiments eagerly followed by the most important practitioners of the time including J.-M. Charcot, founder in 1878 of the first photographic laboratory at the Salpêtrière hospital where Duchenne did much of his work.

Duchenne was the inventor and master of localized faradization: the use of an induction current applied to the body with an electrode so skillfully that he could stimulate a single muscle at a time without piercing the skin. His results were significant: they included the location of the origin of certain muscular diseases; the identification of one of these afflictions, "Duchenne's myopathy," a form of muscular dystrophy; the individuation of the facial muscles and the contribution each made to facial expression. By expanding the use of electricity from a painful instrument of medical remedy

to an objective tool of physiological inquiry, Duchenne created a kind of living anatomy.

Duchenne's interest in photography stemmed from his desire to have permanent records of his facial faradizations. In 1856, after availing himself of the assistance of Nadar's younger brother Adrien Tournachon—there is disagreement about his contribution, but the photographs showing four electrodes and those in which Duchenne and his assistant figure together are generally identified as the ones Tournachon had a hand in—Duchenne set out on his own, learning the wet collodion process so that he could be in control of his results and the viewer's attention. He chose seven models for the variety of their ages, shapes and sex: two young girls, a youthful and an older woman, a handsome anatomist who could mimic the expressions without the electrodes, an old alcoholic workman and—Duchenne's principal model—an elderly cobbler who suffered from a mild anaesthesia of the face. In a orderly and exhaustive series of experiments he applied a series of electrical stimulations to these faces and photographed the resulting muscular contractions one by one to produce a wide variety of expressions, some suggesting extremes of emotion. Duchenne took the pictures in a studio (of undetermined location, perhaps his own house), in medium close up against a neutral background with careful attention to all surrounding details of the *mise en scène* and the lighting which he felt could aid in accentuating the relief of the expressive lines.

In 1862 he exhibited the photographs at the International Exposition in London and published them in *Le Mécanisme de la physionomie humaine ou analyse électro-physiologique de l'expression des passions applicable à la pratique des arts plastiques* [*The Mechanism of Human Physiognomy, or an Electro-physiological Analysis of the Expression of the Passions Applicable to the Practice of the Fine Arts*]. He produced the book at his own expense in both quarto and octavo formats, with a different number—from 72 to 88, depending on the edition—of tipped-in albumen prints. He edited the photographs for publication, reducing some, enlarging others and generally eliminating almost all extraneous information, such as dress, in the aim of objectivity. He also masked parts of the images and rephotographed them to foreground individual muscles. Le *Mécanisme* was divided into scientific and aesthetic sections with text and an atlas of photographs for each. The photographs in the scientific section included nine synoptic tables constructed of up to sixteen expressions each, and photographs of antique sculpture whose facial lines Duchenne had emphasized to exemplify how photography could improve upon or correct artistic representations of the emotions. The aesthetic section seems to have been constructed last; it included full-figure photographs of a new model, a half-blind woman posed in ten tableaux illustrating classical literature and scenarios of Duchenne's own invention. These were his only experiments in showing how the whole body--rather than just the face—participated in the expression of feeling, and he did not pursue them.

Duchenne also produced fifty life-sized oval-format enlargements of his pictures mounted on canvas, varnished and framed in gold. These were intended for the education of artists: introduced in 1872 by anatomy professor Matthias Duval (a colleague of Marey), Duchenne's startling photographs were incorporated into the anatomy teaching at the École des Beaux Arts. Six of them were also adapted by Charles Darwin to illustrate his 1872 *The Expression of Emotions in Men and Animal*s.

Otherwise Duchenne's photographs were generally neither well received nor widely disseminated. Critics found his model, the aged cobbler, indecent and undignified, his hideous grimaces unworthy to represent the soul's expressions. The photographs posed a problem. Rather than signs of inner emotions, of consciousness, of what, in fact, separated man from animal, Duchenne's photographs recorded fear, joy, disdain, or terror as mere physiological facts that could be provoked by electricity and captured by the camera. Stimulated by Duchenne's electrodes, the movements of the facial muscles were understood not as signs indicating the presence of a soul, but rather as free-floating signifiers in a cultural semiotics of muscle movements.

In 1862 Duchenne also published *L'Album de photographies pathologiques complémentaire du livre intitulé De l'électrisation localisée* [*Album of Pathological Photographs Complementing a Book Called Localized Electrical Stimulatio*n], generally considered the first photographically illustrated medical book. The sixteen pictures, taken ca. 1860 of muscular dystrophy cases, epitomise Duchenne's belief in photography's role as a diagnostic tool, permanently fixing the object of the clinical gaze. Duchenne was also an expert practitioner of microphotography and among the first to make images of the nervous system seen through the microscopic lens.

MARTA BRAUN

Biography

Guillaume-Benjamin-Amant Duchenne was born in Boulogne-sur-Mer, 17 September 1806, the son of Jean-Pierrre-Antoine Duchenne, and his wife Marie-Denise Lassalle. He was known as Duchenne de Boulogne to distinguish him from the society doctor Édouard Duchesne. He abandoned a successful medical practice in Boulogne after the death of his first wife in childbirth. The surviving infant, Maxime-Emile, was removed by his maternal grandparents but reunited as an adult with his father in Paris. Maxime's death and that of Duchenne's second wife occurred in 1870. Maxime's

widow continued to live with and assist Duchenne for the rest of his life. Duchenne's position in the highly professionalised and hierarchical world of French medicine was peculiar. He had no official post but he was highly regarded as a kind of specialized researcher and allowed to work with patients in a number of hospitals. He never presented himself for election to the Academy of Medicine, but his contributions to medicine were rewarded by a number of important prizes and the Legion of Honour. His publications were well known, and he was received at the court of Queen Victoria. One of the first doctors to use photographs as scientific data, his photographs of facial expressions were left to the École des Beaux-Arts where they had been instrumental in the teaching of anatomy. He died 15 September 1875 of a cerebral haemorrhage.

See also: Charcot, Jean-Martin; Darwin, Charles Robert; Emerson, Peter Henry; France; History: 6. 1870s; Londe, Albert; Rejlander, Oscar Gustav; and Tournachon, Adrien.

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DUCOS DU HAURON, ANDRÉ LOUIS (1837–1920)

French inventor and physicist

Ducos du Hauron was born 1837 and is known for his very early three-color photographs. In particular, he is known for his subtractive method of color photography by which it is possible to obtain color prints on paper. Throughout his youth du Hauron was interested in the arts, painting and music. At fifteen he was an accomplished pianist. It was not until 1859 that he began to interest himself in color photography.

It is not clear whether du Hauron was influenced by some early color experiments or not. When he started, he was not aware of Maxwell's three-color photographic demonstrations at the Royal Institution in London, which took place in 1861. However, du Hauron was aware of Michel Chevreul's color experiments which demonstrated that over one thousand different colors could be obtained by mixing different proportions of red, yellow and blue pigments.

To make his first photographic color prints du Hauron selected red, blue, and yellow color filters in 1862, which after experimenting with turned out to be incorrect however he later amended this in 1869, by correctly recognizing the primary color filters as red, green and blue. This process involved a viewer rather than prints, with an array of mirrors to combine the three dyed positive images into a single image at the viewing lens. His second photographic negatives were through green, orange-red and blue-violet filters, which were then converted to positives. The positives were printed on three sheets of dichromated gelatin incorporating carbon pigments of red, blue and yellow color respectively, i.e. the complimentary colors to those by which the negatives were recorded. On treatment with hot water, the parts of the gelatin unaffected by light were washed away, leaving red, blue and yellow carbon prints. The three prints, when mounted superimposed, formed a color photograph.

However, rather than converting them into transparencies for projection he dyed each positive with the complementary color of its original filter. Precisely overlapped on white paper, the three films fused into a full color image of the original. The first public exhibition of du Hauron's color photographs took place on 7 May 1869 at the Photographic Society of France in Paris.

Unfortunately, the color sensitivity of black-and-white negative emulsions at this time was rather poor. The film was mainly sensitive to blue and some parts of the green spectrum. There was virtually no red sensitivity at all. Therefore de Hauron's early color prints were less than perfect. Even the most correct theory was bound to lead to unbalanced color photographs until good panchromatic emulsions were available. Du Huron reported that the sensitive of the collodion plate to the three primary colors was 25–30 minutes behind the red filter, 2–3 minutes behind the green filter and only 1–2 seconds behind the blue-violet filter. However, after Vogel's discovery in 1873, that coralline could be used to extend the sensitivity of silver halides into the green

region of the spectrum, du Hauron started to sensitize his plates using dyestuffs. To obtain some red sensitivity, du Hauron started to use chlorophyll.

Ducos du Huron's earliest surviving color photograph, a view of Angoulême, dates from 1877. For example, this photo is reproduced on page 29 in *Histoire mondiale de la photographie en colours*, a book by Roger Bellone and Luc Fellot, published in 1981.

Preceding Ives, Ducos du Hauron developed one-shot prototype color camera, *Photochromoscope*, for recording color photographs.

Already in 1868 du Hauron had described in a letter another potential color photography method which was the *screen plate* technique. However, the letter was not published until 1897. In this process an emulsion is exposed through a screen consisting of a set of very fine lines of red, yellow and blue drawn on glass. Through the red lines only red light could pass and expose the emulsion behind the screen. Likewise, the blue and yellow transmitted only blue and yellow light, respectively. The photographic plate exposed behind the screen was developed and a positive copy made. The positive copy was then overlaid with a similar screen in exact register. The fine, primary-color lines would be blended in the eye so that one could see a the original colors of the object. This technique was first realized by Joly using the correct primary colors and later perfected by the Lumiére brothers when they introduced the Autochrome process in 1907.

In 1897 du Hauron conceived the idea of using a tripack for recording color photographs. Instead of using beam-splitting devices in the camera, he introduced a dialytic selection of the light rays by an alteration of filters and light-sensitive sheets of film or plates. It consisted of a glass coated with a transparent layer of (non-orthocromatic) blue-sensitive silver bromide, next to a yellow filter, to let red and green light to pass to a green-sensitive emulsion, a red filter and then a red-sensitive emulsion. A suggestion of Ducos du Hauron is to manufacture a complete, or *quintuple* (three sensitive surfaces and two screens), set of elements for use in an ordinary dark slide. This set he calls *polyfolium chromodialytique*. After being developed, a yellow print was made from the blue negative, a magenta print from the green negative and cyan print from the red negative. By combining the prints of those complementary colors, full-color reproductions could be made of the recorded tripack plates. However, since no suitable color-sensitive emulsions existed at that time, du Hauron was not able to show the full potential of his invention. It was not really until the 1930s du Hauron's could be demonstrated, when the Kodachrome film was introduced.

In 1899 du Hauron introduced a dual purpose instrument, which was build by Lesueur, the so-called *Mélanochromoscope* which was a combined recording and viewing instrument for three-color photographs.

Hans I. Bjelkhagen

Biography

Ducos du Hauron was born on December 8, 1837 in Langon, Gironde, France. In 1864 du Hauron invented and patented one type of a cinematograph. On February 23, 1869, du Hauron was granted his first French patent (Patent No. 83061, dated November 23, 1868) on additive and subtractive color processes applied to photography, as well as the screen color technique. His first book: *Les couleurs en photographie, solution du problème,* published in 1869, was an important contribution to the understanding of additive and subtractive photographic color processes. His work was exhibited regularly at the Paris Photographic Society from 1869 on. In 1874 du Hauron was granted a French patent on the single-shot photochromoscope (Patent No. 105881, dated December 15, 1874). In 1876 he was granted a British patent on Color Photography (Patent No. 2973, dated July 22, 1876). His patents cover most of modern color photography techniques. Later, in 1892, du Hauron patented also the anaglyph three-dimensional photographic method. His outstanding achievements in photography was acknowledged by being awarded the *1900 Progress Medal* of the Royal Photographic Society for his early work in three-color photography. In 1912, he was made a Chevalier of the Legion d'Honneur. He died 1920 in Agen.

See also: Color Theory and Practice: 1860–1910.

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DÜHRKOOP, RUDOLF (1848–1918) AND MINYA DIEZ (1873–1929)

German photographers

Born in Hamburg, Germany in 1848 to working class

parents, Rudolf Dührkoop was an important professional photographer who stepped beyond the conventional rigid poses of traditional portrait photography as he experimented with different lighting effects, while becoming active in art photography and the Pictorialist movement at the turn of the century.

Rudolf Johannes Dührkoop was born August 1, 1848, the only child of the carpenter, Christian Friedrich Dührkoop, working in a cigar factory, and his wife Johanna Frederica Emile. The little family lived on Mattentwiete in the harbor section of Hamburg. Dührkoop received only an elementary school education and in 1870 he went off to war to serve as a private in the infantry in the Franco-Prussian War. Returning to civilian life in 1872, he married Maria Louise Caroline Matzen, on April 28th, the day his first child, Hanna Maria Theresia was also born. To earn a living he worked for the railroad, and in 1873 his second child, Julie Wilhelmine (Minya) was born on June 21st.

By the end of the 1870s Dührkoop left the railroad, worked as a merchant, and had become quite interested in photography, while experimenting with the wet collodion process. By the early 1880's Dührkoop had published his first article, "On the Use of Yellow Light in Developing Bromide Gelatin Plates" in the Berlin periodical, *Photographisches Wochenblatt*, 1882. He applied for a commercial photographer's license in 1882, and in 1883 opened up his first portrait studio on Grosse Bäckerstrasse 26. Quickly successful, he moved to larger studio quarters in 1884 on Hopfenmarkt 18-19, and by 1889 had moved to Ferdinandstrasse 43 and established branch locations in Altona and St. Pauli, suburbs of Hamburg. His daughter Minya became his creative and competent studio assistant at age fourteen. With her assistance their business thrived and in 1906, the Hamburg studio moved to its final location on Jungfernstieg 34, and Dührkoop opened a Berlin studio on Unter den Linden 10.

Dührkoop's sixtieth birthday and twenty-fifth anniversary of his studio in 1908 was marked by celebrations in both Hamburg and Berlin. Dührkoop received a number of awards and honorary memberships, and a Dührkoop "Medal of Progress" was initiated to be awarded annually to two deserving portrait photographers by the Suddeutschen Photographie-Verein.

Dührkoop's career was marked by his ability to bridge commercial and artistic endeavors, as he ran his successful business and at the same time evolved from a traditional commercial photographer to a leading figure in the development of German art photography and the Modernist movement. As early as 1903, when Dührkoop's work was shown at the Ausstellung for Künstlerische Bildnis-Photographie" in Wiesbaden, a reviewer, Hans Spörl, wrote, "In looking at Dührkoop's work, we are hard put to say which of his rich contributions is the most successful. Dührkoop exemplifies best what is meant by 'creating with one's entire conscience.' There is rarely a line in his pictures that does not successfully add to the total image, no tonal emphasis which can be considered misplaced. He has achieved a total harmony of elements; he has determined the play of light and shade, the distribution of mass and the use of movement with complete certainty and total mastery…" (Hans Spörl, "International Ausstellung für Photographie und Graphische Kunst Mainz 1904" *Photographische Kunst 2* 1903–04: 307) Dührkoop's work was critically acclaimed internationally by critics such as Sadakichi Hartmann and Charles Caffin. In 1907 Hartmann wrote, "Dührkoop apparently searches continually for new light effects… He revels in the mysteries of light and shade—one of the greatest problems portraiture has to offer—and makes his prints sparkle with that delightful freshness which is one of the charms of all good pictures." (Sidney Allan, aka Sadakichi Hartmann, "A German Pictorialist-Rudolf Dührkoop," *The Photographic Times*, 39, 1907: 250–251). Hartmann mentions in particular, Dührkoop's masterful portraits of the "Poet Froensen" and "The Lovers" in each of which the elimination of all unnecessary details and the subtle play of light and shadows on the subjects' faces points to a depth of expression that goes far beyond the accurate rendering of facial features.

Following Dührkoop's active involvement in the organization of the 1909 International Photographic Exposition in Dresden, Charles Caffin was to write in *Camera Work* "…the impression thus of the whole exhibit proved upon further acquaintance to be due to the single authority of a few individuals: conspicuously of Rudolf Dührkoop of Berlin and Hamburg; Hugo Erfurth of Dresden, and Franz Grainer of Munich… their work is distinguished by a variety of treatment and a fertility of resource that are in refreshing contrast to the more hackneyed methods of the American group..."(Charles Caffin, "Some Impressions from the International Photographic Exhibit, Dresden," *Camera Work*, October 1909: 38).

Dührkoop's advocacy for increased aesthetic concerns, that was an integral part of the Pictorialist movement, was inspired and enhanced by the work of Alfred Lichtwork (1852–1914), an influential art historian and founding member of the Hamburg Kunsthalle. Lichtwork had become particularly interested in the field of photography through Ernst Juhl (1850–1915), an affluent engineer and patron of photography. Juhl became an avid collector of Dührkoop's work, beginning in 1901, purchasing over a hundred works by 1915. Dührkoop became a close family friend to the Juhls and became the family photographer. Juhl, Lichtwork, and Dührkoop all

viewed art photography as an integral part of a renewed aesthetic reform and education in German society, that would help promote higher cultural standards in an age of increasing industrialization and mass-production.

Dührkoop gained an international reputation travelling as far afield as England and the United States, showing his work in each place, as well as major cities in Italy and Spain. He was elected to the Linked Ring and Royal Photographic Society in England. He traveled to the United States in 1904 and 1911. (He had his work first exhibited in Boston in 1902.) In 1911 he and his daughter Minya were invited to give a series of lectures in the United States, and attended the annual convention of the Photographers' Association of America from July 23–29, in St. Paul, Minnesota. In his address there, Dührkoop emphasized the need for "Truth and Life" in photography, "to elevate the photograph-taking from a mere reproduction of Nature to imbue it with artistic feeling" (*Bulletin of Photography* 23, September 6, 1911, 153–159). On that trip the Dührkoops traveled as far west as Yellowstone National Park, and returning east, Dührkoop was presented to President Taft in Washington, D.C.

By this time Minya had become an important part of her father's work, having learned her skills from close collaboration with her father. She became director of the Hamburg studio in 1906 and part owner of the business in 1907. Minya's own portrait work featured primarily women and children, quite relaxed, often in naturally lit garden settings. In 1894 she had married Luis Diez, a photographer from Malaga, Spain, from whom she was divorced seven years later. After her father's death in 1918, Minya continued to manage both the Berlin and Hamburg studios. In 1919 she became a member of the Society of German Photographers.

Both Rudolf and Minya's work as "commercial" pictorialists was important in its influence on public taste and in the growing recognition of photography as a Fine Art. An obituary written for Rudolph in 1918 might well apply to father and daughter, "The name Rudlolf Dührkoop is firmly connected with the development of modern photography…he will always be remembered as a noteworthy man, who had the will, the power, and the capability of leading his profession" ("Death of Herr Rudolph Dührkoop," *The British Journal of Photography 66*, 1918: 286).

Katherine Hoffman

Biography

Rudolf Dührkoop was born on August 1, 1848, in Hamburg, Germany. He spent his youth in Hamburg, receiving only an elementary school education. He was married on April 28, 1872, the same day his first child was born. His second daughter, Minya, who was to become his photographic assistant at age 14, was born June 21, 1873. He did not become interested in photography until the late 1870s and opened his first studio in 1883. In 1893 the first "Internationale Ausstellung von Amateur-Photographien" was held at the Kunsthalle in Hamburg, and Dührkoop was introduced to the aesthetics of Alfred Lichtwork. In 1899 he won a silver medal at the "Siebte Internationale Ausstellung von Kunstphotographien" at the Hamburg Kunsthalle. In 1901 he began to publish a variety of articles on the reform of portrait photography. In 1902 he had his first exhibit in the United States in Boston, and in 1904 received a stipend from the Hamburg Senate to visit the St. Louis World's Fair and thereafter traveled through the United States, assembling a collection of American commercial photographers' works. In 1906 he opened his Berlin studio. In 1907 he was elected to the post of Photographic Advisor to the German government to consult on issues related to a new copyright law. He was elected to the Linked Ring and Royal Photographic Society in 1908 and was made an honorary member of the London Salon of Photography in 1910. He continued to work in various aspects of photography until close to this death in Hamburg on April 3, 1918. His daughter Minya continued to manage both the Berlin and Hamburg studios. She died in Hamburg in 1929.

See also: Pictorialism; Hartmann, (Carl) Sadakichi; Juhl, Ernst; and Germany.

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DUMAS, TANCRÉDE (1830–1905)

French photographer

The French-born photographer Tancréde Dumas, believed to have been of Italian origin, travelled extensively in Cyprus, Turkey, Syria, Lebanon, Jordan, Rhodes and Egypt, and had studios in both Beirut and Constantinople.

He trained as a banker before taking up photography, and had a studio in Constantinople before 1865. Cartes de visite survive bearing the legend *T R Dumas et Cie, photographes de vues et costumes, prés du jardin des Fleurs, Grande rue Pera 232*. By 1866, he had a studio in Beirut, and by the early 1870s he styled himself as 'Photographer to the imperial and Royal Court of Prussia' having accompanied the Grand Duke Mecklenburg-Schwerin on a voyage to the far east.

His reputation as a photographer is largely based on a body of work produced in the mid-1870s for the American Palestine Exploration Society (established 1870), under the guidance of the archaeologist Selah Merrill, the American-born clergyman and traveller.

A number of Dumas' photographs were included in Merrill's 1877 album *Photographic Views, taken expressly for the American Palestine Exploration Society, during a reconnaissance east of the Jordan River in the autumn of 1875*.

By the early years of the twentieth century, he had returned to his earlier calling as a banker, heading the banking company of T R Dumas et Fils in Paris.

JOHN HANNAVY

DUNLOP, SIR JAMES FRANCIS (1830–1858)

English photographer

Sir James Dunlop of Dunlop was born on 26 August 1830 in London, England. He was the only son of Sir John Dunlop, Baronet, who was the Member of Parliament for the County of Ayrshire, Scotland. His father died when he was nine and he inherited the title and the extensive family estate with its fine mansion near the village of Dunlop in Ayrshire. He attended Edinburgh Academy and may have been introduced to photography by his aunt, Mrs Frances Monteith. There is a photograph of him by his aunt in the Brewster Album in the J. Paul Getty Museum, California. He was associated with the Edinburgh Calotype Club and his photographs appear in each of the extant albums: one is in the Central Library of Edinburgh and the other in the National Library of Scotland. These were taken on a tour of Europe in about 1847-48 in the company of Reverend James Calder Macphail who also produced photographs of similar subjects, which are in the albums. These are of scenes in Italy and Malta. His participation in photography appears to have ended when he became an Ensign in the Coldstream Guards on 7 April 1849. He was promoted to Major in 1855 and served with distinction throughout the Crimean War being awarded the medal and clasps for the battles at Alma, Balaclava, Inkerman and Sebastopol. Due to poor health, most likely caused by the war, he decided to sell his estate and retired to the South of France in 1857, where he died shortly afterwards on 10 February 1858 at Hyeres. He was unmarried. The church in the village of Dunlop in Ayrshire contains a memorial plaque to Sir James Dunlop.

RODDY SIMPSON

DUNMORE, JOHN L. AND GEORGE P. CRITCHERSON (active 1850s–1870s)

In May 1871, the American artist William Bradford (1823–1892) presented a small display of Arctic paintings and photographs at London's Langham Hotel. The paintings were by Bradford himself, and others, while the photographs, although some were credited to Bradford, had been taken for him, and under his direction, by John L. Dunmore, a Boston photographer from James Wallace Black's studio, and his friend George P. Critcherson.

Their place in the history of photography rests on a single body of work, images produced under the harshest of conditions in the summer of 1869 and on Dunmore's enlightening account of their journey and the challenges of collodio-albumen photography in conditions of extreme cold, "The Camera Amongst the Icebergs," published in the December 1869 issue of the *Philadelphia Photographer*,

While little is known of Critcherson except that he hailed from Worcester MA, Dunmore, had joined Whipple & Black as an assistant in 1854, and continued to work with Black at his independent studio after 1860, and later, in 1876, became his partner. Some reports claim the two men became brothers-in-law, but this cannot be substantiated. James Wallace Black had worked with John Adams Whipple as early as 1850, becoming his partner by 1854, although each man retained and operated his own studio. The Whipple & Black partnership lasted until 1860.

Dunmore and Critcherson. Hunting by steam in Melville Bay, the party after a day's sport killing six Polar bears within twenty-four hours.
The J. Paul Getty Museum, Los Angeles

William Bradford was, by the late 1850s, a marine painter of considerable reputation, and in the 1860s, had embarked on a number of voyages researching material for future paintings. Six voyages along the coast of Labrador in the early 1860s had provided him with much useful material, and had triggered and enthusiasm for further, longer and more challenging journeys. His 1869 journey north of the Arctic Circle on board the steam-assisted sailing barque *Panther* was planned to give him material on which to base several years of work back in his New York studio, and took him as far as Melville Bay on Greenland's west coast.

The group left Boston on June 13th, travelling onwards from New York two days later. By that time, one of Dunmore's chests of chemicals had already been smashed and replaced. Arriving in Halifax Nova Scotia on the 19th, Dunmore found his woes were not at an end—two cases containing one hundred glass plates had been broken, and he spent some time sourcing new sheets of glass. With the help of distinguished local Halifax photographer, William Chase, the new plates were albumenised and repacked ready for the journey to Greenland. The steamer *Panther* arrived a few days later and Dunmore supervised the construction of a fifteen by six foot 'dark-closet' on board before the party left on 3rd July.

Along the way, in St John's, Newfoundland, Dunmore took 'twenty-five to thirty views of the beautiful scenery thereabouts.' Arriving in Greenland, the first photographs were taken at Cape Desolation and Julianshaab—where he photographed the local governor and his family, and 'some views of the Esquimaux huts.'

But it was once they had travelled further north to the Glaciers that the finest images were produced. Considerably aided by the highly reflective snow and ice, Dunmore was able to produce perfectly exposed 14 × 18 plates with an exposure time of only two seconds—a combination of image size and exposure which is remarkable. He also refers to taking photographs of bears on the ice flows and taking 'two very good negatives of them from the topgallant forecastle' of the *Panther*—a camera position which would not tolerate long exposures. The crew wished to shoot the animals immediately, but Dunmore persuaded them 'to let me shoot first with the camera.'

From his account of the journey, a picture of his choice of process emerges. At the outset he talks of albumenizing his plates in Nova Scotia before embarking on the *Panther*—suggesting the use of a collodio-albumen dry plate—but at the site of a huge glacier, he refers to the wave created by ice falling into the sea 'which sent the water up twenty feet all over us, and washed away collodion, developing glass, green baize, etc., and came very near to taking us along with it.' That suggests that, in addition to dry plates, he was also coating wet plates while on location—a practice as difficult in the Arctic cold as it was for other travellers in the heat of the Egyptian desert.

The party left Greenland for the last time on September 16th and returned to America.

Dunmore returned to work at Black's studio, while Bradford went to work on his paintings, and Dunmore's name next appears in the media 7th March 1870 issue of the *Philadelphia Photographer*, under the heading 'Sad Accident.'

> On the evening of February 4th while Mr. J. W. Black of Boston, and his worthy assistant, Mr. J. L. Dunmore, were about to commence a lantern exhibition in Lowell, one of the gas bags [the lamp on the lantern projector was gas fuelled] exploded with tremendous force, threw Mr. Dunmore high in the air and burned him sadly about the face and eyes, knocked Mr. Black senseless, drove a stick through the nose of the organist, and damaged the organ-loft, organ and church considerably. Mr. Dunmore at this writing still lies suffering much and very low, but, with great care, it is hoped, may recover his sight.

Dunmore did, indeed, recover both his health and his sight.

William Bradford's portfolio-format book containing 140 of Dunmore and Critcherson's images, was eventually published in London in 1873 in an edition of 350 copies under the title *The Arctic Regions: Illustrated with Photographs Taken on an Art Expedition to Greenland.*

While Dunmore gives no information on his photographic equipment, save for the reference to taking 14" × 18" negatives, the images in the book—tipped-in albumen prints—are predominantly in two sizes, one just under 6" × 9" and the large prints approximately 15" × 11". It is likely therefore that he took at least two cameras.

It was a landmark in the publication of photographically illustrated books, remains one of the most impressive volumes of photographs published in the 19th century.

John Hannavy

See also: Albumen Print; and Books Illustrated with Photographs: 1870s.

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DURANDELLE, LOUIS-EMILE (1839–1917)

Born in 1838 in Verdun to Jaques Durandelle and Anne Bastien, Louis-Emile Durandelle was among the most accomplished architectural photographers in nineteenth-century France. Little is known of his early training, but by 1854 he operated a studio with Hycaninthe Cesar Delmaet (1828–1862) at 30–32 Chaussée de Clignancourt, Paris. After Delmaet's death in 1862, Durandelle married Delmaet's widow, Clémence Jacob Delmaet, who retained her first husband's surname and actively participated in the running of the studio which continued to bear the name Delmaet and Durandelle. In 1862, the studio moved to 22 blvd des Filles-du-Calvaire; after 1868 it was located at 4, rue du Faubourg-Montmartre.

Although an 1868 prospectus indicates the range of the studio's output, which included *cartes de visite*, enamel portraits, and "artistic and industrial reproduction" of objects, Durandelle is best known for photographs of building projects in and around Paris. While Durandelle undertook relatively modest projects, such as photographing the contruction of a tram station and various private houses in Paris in the early 1860s, he is best known for a magnificent series of about 115 photographs made between 1865 and 1872 that record the construction and decoration of the Paris Opéra.

Designed by architect Charles Garnier and built between 1861 and 1875, the flamboyant Paris Opéra was one of the grandest architectural projects of the emperor Napoléon III's reign, and a symbol of urban planner Baron Haussmann's architectural and spatial modernization of Paris. Durandelle's large-format albumen prints, most made from 38 × 28 cm glass negatives, provided sharp, vivid records of the successive phases of the massive construction project that entailed excavating a large site in Paris's ninth arrondissement. While Durandelle may have made some prints of the Opéra as early as 1862, it was only in 1865 that he began systematically photographing the site and numbering his negatives (Keller, 109). Durandelle's photographs not only documented the progress of the building, but also recorded in close detail the aspects of construction that would later be invisible to the naked eye, including the iron structural supports that were eventually covered by a marble façade and architectural and decorative elements, such as columns, pediments, and decorative sculpture, that were placed high on the building's façade and thus less accessible to the camera or the human eye.

Many of the photographs from the Opéra series were eventually published (uncredited) as *Le Nouvel Opéra de Paris,* a tome that included two text volumes, two volumes of lithographs and engravings, and four volumes of photographs. The four folio albums, *Sculpture ornementale, Statues décoratives, Peintures décoratives,* and *Bronzes*, include 115 photographs by Durandelle and were distributed to architects and designers.

Precise, economical, and accomplished, Durandelle's photographs of the Opéra served multiple purposes: architectural, technical, juridical, bureaucratic, historical, and descriptive. Many possess an almost abstract formalism and dramatic rendering of space and light

that set them apart from other contemporary examples of architectural documentation. The scrupulous directness with which Durandelle approached his subjects, exploring their forms, contours, and the distribution of light and shade across planes, endow the raw materials of construction—beams, windows, planks—with unexpected expressive force. Yet the incipient modernism of this tendency toward abstraction is in part a direct consequence of the technical constraints of both Durandelle's relatively simple equipment and the documentary nature of the project, which required highly detailed, optically sharp, easily readable images (Keller, 112–113).

The firm Delmaet & Durandelle undertook other projects to recording the massive building and renovation programs in Paris and elsewhere in France in the last third of the nineteenth century. These projects included photographing the rebuilding of the Hôtel-Dieu (1868), the building of the Bibliothèque Nationale (1870), the destructions wrought by the Franco-Prussian war and the Paris Commune (1870–71), the renovation of the abbey of Mont-Saint Michel under the architect Edouard Corroyer (1874–8), the construction in Montmartre of Sacre Coeur (1877–90), designed by architect Paul Abadie, and finally the construction phases of the Eiffel Tower, which was begin in 1887 and completed in 1889. Photographs from the latter two projects are included in albums at the Bibliothèque Nationale, *Construction de la Tour Eiffel* (2 vols., 1889), and *Eglise de Sacre Coeur à Montmartre* (2 vols., 1890). Additionally, the firm completed smaller projects, such as documenting the construction of the theater at Monte Carlo (1880), also designed by architect Charles Garnier, and photographing the archaeological excavations of the subterranean space under the Louvre (1882–84).

Durandelle's prints of the Opéra were exhibited to acclaim in the universal exhibition of 1878, Paris. He also won medals in the universal exhibitions of 1878, 1882, and 1889. After the death of Clémence, Durandelle retired to Bois-Colombes in 1890 and married Julie-Eugenie Saint-Léger. He left his studio to Paul-Joseph-Albert-Chevojon, who continued to make industrial and architectural photographs. Durandelle died in 1917.

Major holdings of Durandelle's photographs include the Bibliothèque Nationale, Paris, the Bibliothèque Historique de la Ville de Paris, the Musée d'Orsay, Paris, the Canadian Centre for Architecture. There are no known family archives or correspondence.

SARAH KENNEL

Biography

Born in 1839, Louis-Emile Durandelle was among the most accomplished architectural photographers in nineteenth-century France. Little is known of his early training, but by 1854 he operated a studio with Hycaninthe Cesar Delmaet (1828–1862). After Delmaet's death in 1862, Durandelle married Delmaet's widow, Clémence Jacob Delmaet, who retained her first husband's surname and actively participated in the running of the studio. The firm "Delmaet and Durandelle" was responsible for documenting the construction or rebuilding of some of the most important landmarks in Paris, including the Paris Opéra, the the Hôtel-Dieu, the Bibliothèque Nationale and the church of Sacre-Coeur, and the construction of the Eiffel Tower. Durandelle exhibited photographs in the universal exhibitions of 1878, 1882, and 1889. In 1890, upon the death of Clémence Jacob, Durandelle sold the business and archives to his assistant Paul-Joseph-Albert Chevojon.

See also: Bibliothèque Nationale.

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DURIEU, JEAN-LOUIS-MARIE-EUGÈNE (1800–1874)

Jean Louis Marie Eugène Durieu (1800, Nîmes, France–1874, Paris, France) was an early French photographer of nudes (male and female), known for making studies for Eugène Delacroix. Some of Durieu's nudes were used by Delacroix to create his own paintings and drawings.

Durieu was a jurist, he served the government during the stormy prelude of the French Second Empire. In 1824 he founded a periodical 'Le Mémorial des Percepteurs.' In 1842 he collaborated on a play 'The Husband of the Widow' which remained in the repertoire of the Théatre Français until 1900. He was also a photographer specializing in daguerreotypes and in 1845 he made astral views with Baron Gros. In 1847 he was leading the administrative section of the, Communes, Ministery of the Interior as Inspector-General of Hospices and Public Utilities. As an administrator he

helped create the Corps of Diocesan Architects. In 1848 he became active with experimenting with calotypes and was appointed Director-general of the Administration des Cultes, by then he was working with the Commission for Historic Monuments, as well as with Prosper Mérimée and Charles Blanc. Together they made a vast inventory of photographs of ancient and medieval monuments in France. Durieu was a friend of Viollet-le-Duc and Eugène Durieu, director of the Administration des Cultes, who was an advocate of the paper negative for recording historical monuments, though critical of it in other respects. Durieu though, produced pictures of artists'models, naked or clothed, Arab slave-girls, Italian characters, and theatrical-style studies. One of his albums belonged to Delacroix, who had no qualms about copying the prints in pencil. Photographs, being 'studies' in the sense used by painters, in order to attempt rendering light, were for Delacroix *'an intermediary charged with initiating us more deeply into the secrets of nature (…) a copy, in some ways false by dint of being exact.'* It was around people such as Durieu and Delacroix that a whole critical theory developed, expounding the difference between photography and pictorial arts while merging together arguments for a renewal of both. This redefining was realized by the sudden success of photography during the 1860s, however it remained unforeseen at that time. Later a definition of 'photography as art' was conceived, based on the need for the photographer to make a personal choice concerning the unity of the image, obtained in a single exposure, and the avoidance of superfluous details, of which both were end results that the calotype process favored.

In 1850 Durieu left the Direction des Cultes and retired, meeting Eugène Delacroix (1798-1863) shortly after. Some painters, including Dante Gabriel Rossetti, made use of photography without revealing its influence. Others such as Eugène Delacroix, saw photography as advantageous to drawing and painting. Delacroix was a leader of the Romantic Movement that rejected classical formalism and emphasized artistic imagination featuring the dramatic, emotional, and personal, often through the use of historic and/or erotic subject matter. Delacroix had nude models posed for Eugène Durieu to be photographed and then he enthusiastically used these photographs as source material. Delacroix claimed that looking at photographs provided him a greater understanding about the human body than the inventions of any 'scribbler.' Drawing, sketching, painting, or modeling the nude has remained a classic problem for Western artists since Masaccio's time, but it did not become the photographer's problem until the 1850s, when artists began to use the new medium as a draftsman's aid. Generally painters and the photographers who collaborated with them cloaked the model in paraphernalia to match the artist's intention, Master Eugène Durieu, for example, draped vaguely exotic materials near the models he photographed for Delacroix.

In 1851 he became a founding member of the Société héliographique. In 1853 Durieu began actually taking the photographs of nude models for Delacroix who supervised the drapings. He was especially known for his nudes and models and thus Nude photography defined as the genre of art photography, whose subject is the representation of the naked (full nude) or partially naked (half nude) human body.

The aesthetic value of nude photography and its boundaries with erotic photography can only be determined with difficulty and on an inter-subjectively level, furthermore it is also affected by its numerous overlaps with pornography. In consequence, nude photography and erotic photography always find themselves branded in multiple ways, and labeled as works of artistic freedom, aesthetics, kitsch, junk or provocation. The boundaries of nude photography, erotic photography and pornography are so undefined and continuously changing that they are always determined and defined by the subjective moral view of the individual and the generally accepted cultural confines of "customs and tradition."

The nude is a classic subject in art. The early high cultures (Egypt, Crete, India among others) already knew nude representations. Its development into other represented forms can be pursued from Greek clay artifacts to the art of the middle ages and on to the European art of the modern age. Since the renaissance era, the study of the nude human body has been an intrinsic part of art education at art academies.

By 1847 the nude also became the object of photography, the first nude photographers included Philippe Debussy, E. Delacroix, Eugene Durieu and B. Braquehais. Models were both professionals and prostitutes, and photographs were both artistic and "spicy," which often raised the aversion of moral and law enforcement officers.

In 1855 Durieu wrote a report on the Société française de photographie (SFP) exhibition and together with the vice-president Paul Périer began a discourse concerning the position of art photography. Between 1855 and 1858 Durieu was the chairman of the SFP. board and offered 8 prints to the SF. and at about the same time he was made an honorary member of the Photographic Society of London. In 1856, it was noticed that his prints at the Brussels exhibition had become very pale, while other prints remained well preserved. In 1857 he left 32 Rude du Bac and moved to 10 Rue des Beaux-Arts, Paris. In 1865 he lived at 170, Rue de Rivoli in Paris.

The Société française de photographie, founded in Paris in November 1854, gave no encouragement to artificial picture making, nor to retouching. Its President Eugène Durieu condemned handwork absolutely. 'To call the brush to the aid of the photograph under the pretext of introducing art into it, is doing precisely the

opposite—excluding *photographic art*.' French painters who took up photography, like Gustave Le Gray, Vallou de Villeneuve and Charles Nègre practiced it for its own aesthetic appeal. They did not go beyond legitimate *genre* photographs of picturesque characters such as on organ grinder by Nègre or some Savoyard street musicians by Disdéri.

Durieu also photographed Clamart and St Valéry-en-Caux between 1851–1855. He used daguerreotype, wet negative paper, wax paper prints, salted, collodion and gold toning. His photographs are now in the collections of the Bibliothèque Nationale in Paris, the S.F.P. in Paris, George Eastman House in Rochester (USA).

JOHAN SWINNEN

See also: France; Delacroix, Ferdinand Victor Eugène; Nudes; Société Française de Photographie; Royal Society, London; Société Héliographique Française; Bibliothèque Nationale; Genre; and Painters and Photography.

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DURYEA, TOWNSEND (1823–1888) AND SANDFORD (1833–1904)

Townsend Duryea was born in Long Island, New York in 1823, the eldest son of Hewlett Duryea and Ann Bennett. His younger brother Sanford Bennett Duryea was born in Long Island on 22 February 1833. Townsend started working as a daguerreotypist at 140 Grand St, in Williamsburgh (Brooklyn) in 1840. He was joined in his studio in 1851 by Sanford. After remarrying Townsend left for Australia in 1853 aboard the *Canton,* and established two studios with Archibald McDonald in Melbourne in 1854 and they were then joined by Sanford who arrived aboard the *Nightingale* in August, leaving the New York studio under the control of their nephews Alva Adee Pearsall (b. 1839) and G. Frank E. Pearsall (b. 1841) who both later opened studios of their own in New York. Duryea and McDonald branches were opened in Geelong and Tasmania and they employed Charles Nettleton in Melbourne to perform the outdoor work. The Duryea brothers relocated to King William St, Adelaide in 1855 offering daguerreotypes and ambrotypes. During 1856 they visited country towns and Sanford set up the first studio in 1857 in Perth, Western Australia, before returning to Adelaide in 1859. He made several more visits to Perth, but broke from his brother and returned to America in 1863. Townsend was the society photographer of Adelaide producing fine cartes de visite and training others in photography including Robert Sheppard Stacy and Henry Jones, not to mention his four sons Townsend (b. c.1854), Edwin (b. 1857), Richard (b. 1859), and Frank (b. 1861) who all went on to open studios. Townsend created a massive 14 panel panorama of Adelaide during 1865. He was the official photographer for the Royal visit of H. R. H. the Duke of Edinburgh, Prince Alfred in 1867. A branch studio was opened in Wallaroo in 1873 and then Moonta, operated by Saul Solomon, who later opened another Adelaide branch at 51 Rundle St. On 17 April 1875 the King William St studio and 60,000 negative were destroyed by fire; Townsend relocated to Moonta installing George Bentley as operator, his rebuilt Adelaide studio being taken over by Stephen E. Nixon and Charles H. Manning. Townsend retired from photography at the age of 57, and took up farming in the Riverina district of NSW where he died in 1888. Sanford resumed photography opening a studio at 253 Fulton St, Brooklyn in 1876. Sanford's studio was damaged by fire in 1878 but he rebuilt and he opened a branch at 297 Fulton St in the late 1880s. Sanford's son Hewlett a.k.a. Frederick went to California and became a Kodak agent. His son Chester learnt photography and became a pioneer in the field of radiology. Sanford retired around the age of sixty and died in Long Island in 1904. Henry Augustus Duryea, Townsend's son from his first marriage also worked as a photographer in Brooklyn from around 1880 until his death in 1889.

MARCEL SAFIER

DUTILLEUX, CONSTANT (1807–1865)

French teacher and photographer

Born in 1807 in Douai in northern France, Constant (Henri-Joseph) Dutilleux moved to Paris in 1826 where he worked in a printer's shop and trained at the Ecole des Beaux-Arts. In 1830 he moved from Paris to Arras, where he taught painting, drawing and lithography and ran a lithography firm. Dutilleux, who learned cliché verre technique from Adalbert Cuvelier and drawing professor Léandre Grandguillaume in early 1853, introduced the technique to Camille Corot who, like Dutilleux, was best known for his *en plein air* landcape painting. Working in Arras and, after 1851, in the forest

of Fontainebleau alongside Barbizon artists, Dutilleux produced numerous paintings, drawings, and at least thirteen clichés-verre representing landscape and rural scenes, made in 1853 and again in 1857. Like Corot, who executed his first clichés-verre in collaboration with Dutilleux, the latter's work in this technique epitomizes the close relationship between painting and photography that characterized the Barbizon school. Unlike the linear, graphic qualities of Corot's early clichés-verre, however, many of Dutilleux's clichés verres were made by the painted plate method and exhibit softer lines and a broad tonal range. In 1860, Dutilleux moved to 58 rue st Georges, Paris, leaving his lithography studio to former pupil Charles Desavary. He died in Paris 1865. The Musée des Beaux-Arts, Arras, holds a significant collection of Dutilleux's clichés verre.

SARAH KENNEL

E

EAKINS, THOMAS COWPERTHWAITE (1844-1916)

American painter, sculptor, photographer, and teacher

Eakins was born in Philadelphia, Pennsylvania, and began his career by assisting his father, Benjamin, as a calligrapher and teacher of penmanship. His interests in draftsmanship extended beyond decorative writing, however, and from 1862 until his departure for Paris in 1866 Eakins studied drawing and anatomy at the Pennsylvania Academy of the Fine Arts (PAFA) and Jefferson Medical College in Philadelphia. In Paris, he enrolled at the prestigious Ecole des Beaux-Arts and became a pupil in the ateliers of Jean-Léon Gérôme and Léon Bonnat. Although he likely had gained exposure to photography before traveling to Europe, there Eakins learned about the documentary and artistic value of using photographs as study tools with which to compose and add subtle details to paintings. He also came to believe that an understanding of the mechanics and structure of the human body was the true basis for creating art.

Returning to Philadelphia in 1870, Eakins later joined the PAFA staff as an assistant instructor. In 1878 he was approached by the school's Chairman of Instruction, Fairman Rogers, to help him solve a visual puzzle. When Eadweard Muybridge publicized his motion photographs of racehorses, the size, lack of detail, and inconsistent intervals of the serial images kept Rogers from testing them for accuracy of movement. Rogers hired Eakins to produce drawings of the photographs with which the artist would reconstruct the horses' positions in a consistent series. The two men could then test the results by "reanimating" the photographs in a zoetrope. Eakins applied his results to painting, depicting Rogers riding with his own team of horses in *A May Morning in the Park (Fairman Rogers Four-in-Hand)* (1879–80).

Muybridge later continued his *Animal Locomotion* project at the University of Pennsylvania, and in 1884 Eakins joined him in his work. The two men outfitted a track with a series of cameras whose shutters were tripped at regular intervals as an animal or human subject walked, ran, or jumped through the space in a full period of motion. Rejecting Muybridge's use of sequenced negatives, however, Eakins instead recorded successive exposures of motion on a single negative. In photographs such as "History of a Jump" (1885), he adapted Etienne-Jules Marey's invention of a spinning slotted disk that regularly admitted light to a single point on the open lens of the camera. Muybridge published his photographs in *Animal Locomotion* in 1888 and included a summary of Eakins's research in Professor William Marks's essay, "The Mechanism of Instantaneous Photography."

Eakins had purchased his own camera by 1880 and soon produced photographic sketches of his family members at home and on the beach at Manasquan, New Jersey. Becoming director of the schools at PAFA in 1882, he captured students posed in period clothing and photographed Margaret Harrison in preparation for his painting, *Singing A Pathetic Song* (1881).

By 1881, Eakins employed a magic lantern or another device to project his photographic images onto his painting supports. In his earliest attempts, he traced the outlines of the projected forms in pencil but later abandoned this underdrawing technique and used the projections to incise tiny reference marks onto his canvases. In two versions of *Shad Fishing at Gloucester on the Delaware River* (1881), he utilized multiple projected photographs to compose his paintings with marks made during the various stages of the painting process. (See Tucker and Gutman in *Thomas Eakins*, 2001, Further Reading.)

Beginning about 1883, Eakins undertook three photographic studies of the nude for use in his painting

Eakins, Thomas. Eakins, Thomas. Nude Men on the Beach.
The Metropolitan Museum of Art, David Hunter McAlpin Fund, 1943 (43.87.23) Image © The Metropolitan Museum of Art.

and his teaching at PAFA and the Philadelphia Art Students' League. Many of these images were made with the assistance of or, often, by his students, including Susan Macdowell, whom he married in 1884. One group of nudes, taken in the studio, was comprised of photographic "académies"—studies of poses echoing classical sculpture and painting—that might be used in the creation of narrative art. Insisting that students should learn from life rather than by drawing or painting only from classical casts, he had them pose for each other in these photographs. Depicting a reclining nude Bill Duckett or an unnamed female model reposed in the manner of an odalisque, he and the students created beautiful and technically useful images.

In 1883 Eakins also pictured his students, professional models, and himself posing in a separate group of images he called the "naked series." "J. Laurie Wallace: Naked Series" and others from the group showed subjects in uniform standing poses seen from seven perspectives. Mary Panzer has linked these photographs to Eakins's motion series, stating that whereas the motion photographs revealed the body's position in action, the naked series showed comparable views of weight shifts in the stationary figure. (see Danly and Leibold, 42, Further Reading). Hanging these images together in the PAFA studio, Eakins and his students used them to determine both the figures' centers of gravity and their differences of physique within identical poses. The photographs helped them to paint, draw, or sculpt figures with lifelike volume and movement.

Eakins's third collection of nudes featured himself and his students together in idyllic communion with nature. These pictures were taken during outdoor excursions to nearby locations in Pennsylvania and New Jersey and provided the backbone for Eakins's paintings *Arcadia* (c. 1883), *An Arcadian* (c. 1883), and *The Swimming Hole* (1884–85). Referencing both a classical past and a present of unashamed camaraderie, the photographs exhibited the bonds of friendship and honest integrity that linked teacher and students

in their drive for artistic professionalism. These bonds were maintained in the display and production of nude photographs at the Art Students' League after Eakins's forced departure from PAFA in 1886.

From the 1890s until his death in 1916, Eakins's interest in photography appears to have diminished as he concentrated his efforts on painting portraits. His work would influence the work of Eva Watson-Schütze and other pictorialist photographers, however. In tribute to his work as a photographic pioneer, members of the pictorialist Camera Club of New York included two images of bathers by Eakins in their 1899–1900 exhibition.

MEREDITH KEY SOLES

Biography

Thomas Cowperthwaite Eakins was born to Benjamin and Caroline Cowperthwaite Eakins on 25 July 1844 in Philadelphia, Pennsylvania. He first studied drawing at the Pennsylvania Academy of the Fine Arts (PAFA) before enrolling at the Ecole des Beaux-Arts in Paris from 1866 to 1869. Returning to spend his career in Philadelphia, he became an instructor and, in 1882, the director of schools at PAFA. He married one of his students, Susan Hannah Macdowell, in 1884. Eakins was dismissed from his director's position in 1886 after he removed the loincloth from a male model posing for a class of female students. Thereafter, he continued to lecture at the Philadelphia and Washington, D.C. Art Students' Leagues, the Women's Art School of the Cooper Union, and the National Academy of Design. Although he showed his painting and sculpture nationally and internationally, the only recorded exhibitions of his photographs were the 1886 display of "History of a Jump" in the Philadelphia Photographic Society annual at PAFA and that of two bathers at the 1899–1900 New York Camera Club exhibit. Eakins was active as lecturer and portrait painter until shortly before his death in Philadelphia on 25 June 1916.

See also: Muybridge, Eadweard James; Motion Photography: Pre-Chronophotography to Cinematography; Marey, Etienne Jules; and Pictorialism.

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EASTLAKE, SIR CHARLES LOCK (1793–1865)

British patron

Born 17 November 1793 in Plymouth, England, Charles Lock Eastlake was, "the first, and perhaps still the greatest, of that tribe of cultural bureaucrats who…were to become the most significant manipulators of taste and controllers of artistic power…" Sir Charles Lock Eastlake is easily confused with his nephew, Charles Locke Eastlake (1836–1906). The younger Eastlake, also a Victorian taste-maker, was author of two widely known works, *Hints on Household Taste* (1868) and *A History of the Gothic Revival* (1872). Eastlake's initial ambition was to become a painter and to this end, he studied in France, Greece and Italy from 1816 to 1830. During these years, Eastlake was increasingly influenced by a newly emerging German approach to art scholarship that sought to apply a scientific basis to art criticism. He undertook a second career as an art critic and historian culminating in his immensely influential, annotated translation of Johann Wolfgang von Goethe's *Zur Farbenlehre* (1810) as *Goethe's Theory of Colours* (1840)—a publication challenging Newton's seven-color theory with one based on three primary colours. Eastlake's other publications included the first volume of *Materials for a History of Oil Painting* (1847) and a collection of articles entitled *Contributions to the Literature of the Fine Arts* (1848).

While abroad, Eastlake's painting and writing attracted the attention of his fellow expatriates and London critics to the extent that he was elected, *in absentia*, as an Associate to the Royal Academy, becoming a full Academician shortly after his return to England. In 1841, Eastlake was appointed Secretary of the Fine Arts Commission, followed in 1842, by an appointment as Librarian of the Royal Academy and in 1843, as Keeper of the National Gallery. Forced to resign from the Gallery in 1847 over the mistaken purchase of a forged Holbein, Eastlake was nevertheless appointed President of the Royal Academy in 1850. In 1855, he returned to the National Gallery as its first Director, maintaining that post (as well as his Presidency of the Royal Academy)

until his death. Enjoying the full support of both Prince Albert and Parliament, Eastlake greatly expanded the collection of the National Gallery.

Eastlake's knowledge of and interest in photography was at least partly due to his association with the writer and critic Elizabeth Rigby whom he may have met as early as 1843. Rigby was at that time living in Edinburgh where she had both written about and posed for David Octavius Hill and Robert Adamson. As an art critic, Rigby wrote glowingly of a series of Eastlake's portraits, referring to him in her journal of 2 March 1844 as "the Raphael of England." Their professional relationship, as advocates of German art historicism in Britain, evolved into a romance and on 9 April 1849, the middle-aged couple was married at St. John's Church in Edinburgh.

From their position as what Steegman calls a "composite personality"1 atop the mid-Victorian art world, the Eastlakes' support of photography lent considerable prestige to the new medium. The first manifestation of this may have come through Sir Charles' (he was knighted in 1850) position as a member of the Board of Governors of the Great Exhibition of 1851. The Board sanctioned the most ambitious retrospective of photography in the medium's 12 year history, while the Great Exhibition as a whole recognized photography as both an industrial process and a tool for recording of the event itself.

Eastlake's involvement with photography continued in the following year as part of the effort to encourage William Henry Fox Talbot to relinquish his patents on the calotype process. Talbot had agreed to the request on the condition that he would be officially asked to do so by major figures in the British artistic community. Together with Lord Rosse, President of the Royal Society of Arts, Eastlake signed the formal request. Talbot responded with a letter allowing free use of the process by all but professional portrait photographers (both documents then being published in the *London Times* on 13 August 1852). This agreement failed to satisfy the professional photographers, who continued to press Talbot for unconditional release of his patents. It is H.J.P. Arnold's contention that the impasse became an impetus for Roger Fenton's organization of the Photographic Society of London while Gail Buckland asserts that it was Talbot's refusal to relinquish his patents that delayed the Society's formation. In either case, the effort to placate Talbot by offering him the Presidency of the new society was met with Talbot's refusal. At its first meeting on 20 January, 1853, it was instead Sir Charles Eastlake who agreed to become the Society's first President. As Elizabeth would write in her anonymously published 1857 *Quarterly Review* article, "Photography," her husband was selected by the members "in order to give the newly instituted body the support and recognition which art was supposed to owe it."

Eastlake served two consecutive terms as President of the Photographic Society of London (1853–1855). Although Fenton, as the Society's Honorary Secretary, was responsible for most of its organizational activities, there is little doubt that the Society benefited directly from Eastlake's long association with the Royal family. In May 1853, both Queen Victoria and Prince Albert became members and then on 2 June 1853, during the Society's fifth meeting, a letter from Buckingham Palace announced the bestowal of Royal Patronage upon it. Eastlake was among those who escorted Victoria and Albert through the Society's first exhibition in January, 1854 at the Suffolk Street Gallery of the Society of British Artists. As the Royal family's artistic advisor, Eastlake may also be credited with establishing their use of photography as a tool in art historical studies. In 1853, Prince Albert commissioned a systematic photographic record of the Royal family's Raphael drawings, a work later published as *"The Raphael Collection at Windsor Castle.*"

Eastlake's contributions to photography between his departure from the presidency of the Photographic Society and his death in Pisa on 24 December 1865 are more nebulous. Although he and Elizabeth were in close agreement on artistic issues, there is no evidence of his collaboration in her seminal 1857 essay. Perhaps his greatest contribution in those years as before was to lend the considerable weight of the official Victorian art world to at least a consideration of the medium's legitimacy.

Renate Wickens-Feldman

Biography

Sir Charles Lock Eastlake was born on 17 November 1793 in Plymouth, England. From 1816–1830, he pursued a career as painter and art historian in France, Greece and Italy. Upon his return to England, Eastlake was appointed to a series of official positions culminating in President of the Royal Academy (1850) and Director of the National Gallery (1855). Eastlake's interest in photography was encouraged through his association, from the mid-1840s, with the critic Elizabeth Rigby, whom he married in 1849. In 1852, Eastlake helped mediate the agreement by which William Henry Fox Talbot placed his patents in the public domain for all purposes other than portraiture. The following year, he was appointed President of the newly formed Photographic Society of London, a position he retained until 1855. Eastlake's long collaboration with Victoria and Albert was likely responsible for the Society's gaining royal patronage. He died in Pisa on 24 December 1865.

See also: Hill, David Octavius, and Robert Adamson; Talbot, William Henry Fox; and Victoria, Queen and Albert, Prince Consort.

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EASTMAN, GEORGE (1854–1932)

The close of the 19th century was a watershed in George Eastman's life (1854–1932): a time when he moved from active, intensive work in photography, from building the factories to market his products and amassing great wealth to a time of relative leisure and the building of institutions to serve humankind through music, medicine, dentistry, philanthropy, racial advancement, and education both technical and liberal. Spanning this watershed was the photographic revolution he initiated.

As a 23-year-old bank clerk in Rochester, NY with a sixth-grade education, Eastman entered hobby photography in 1877, purchasing a collodion wet-plate camera and paraphernalia to record trips. He subscribed to the *British Journal of Photography* in 1878 and in the very first issue, learned about gelatin dry plates. He began producing dry plates for his own use and in 1880, for sale through the E. and H. T. Anthony Company in New York. He also patented machines to coat the plates, first in London (July 1879) and then in the USA (April 1880).

The bank clerk gained a business partner on 1 January 1881 when Col. Henry Alvah Strong, a buggy-whip manufacturer, invested $1,000 in the Eastman Dry Plate Company. Strong would hold the honorific title of president until his death in 1919 with Eastman being the treasurer and general manager (comparable to today's CEO).

Eastman continued working at the bank until September 1881, tending to his dry plate business from 3 PM until midnight and weekends. His reputation for superior plates resulted in a growing business until an emulsion crisis almost closed the business in 1882. He sped to London, photographic capital of the world, "standing in the works" of Mawson & Swan Dry Plate Company for two weeks to learn the reason for the emulsion failure. (His supplier had changed gelatin sources and a vital ingredient—sulfur—was missing.)

Recovering after recalling and replacing the spoiled plates, Eastman soon realized that professional studio photographers and serious amateurs comprised a finite market. In order to grow his business, he would have to target a growing market: everyone. But in the 1880s, hardly anyone entertained the thought of taking pictures himself. Eastman would not only have to simplify photography so that the absolute amateur could take pictures, but he would have to create the desire to do so through advertising and marketing. Part of his genius was combining innovation, simplicity, and quality products with pithy slogans such as "You press the button, we do the rest."

From 1881 on, Eastman pursued transparent, flexible substitutes for heavy, breakable glass, marketing a paper-backed film and roll film holder in 1884. His inability to produce a film without the paper backing led him to hire an undergraduate chemist, Henry Reichenbach, to spend all of his time working on this quandary.

Eastman tinkered until he had constructed a simple, hand-held camera that used the paper-backed film and that anyone, even the rankest amateur, could operate. The Eastman Detective camera (1886) was a dismal failure but the Kodak camera (1888) was a runaway success.

While anyone could take pictures with Eastman's simple Kodak system, developing the paper-backed film was devilishly difficult. So in 1886, he started a photo-finishing business—probably the first in the world. Factory processing of the finished product circumvented the professional photographer and created a vast new market undreamed of by Daguerre and other early photographers.

When the Kodak camera was introduced, it came loaded with a roll of film with 100 exposures. After

the photographer had finished the roll, he could send the whole camera back to Rochester where the film was developed, prints were made and sent back along with the reloaded camera. (Daylight-loading film was invented in 1892.)

Finally in August 1889, Eastman introduced Reichenbach's transparent, flexible nitrate film. The difference in film quality was so obvious that film and camera sales soared again. The 1890s saw the photographic revolution continue with smaller, more efficient camera models culminating in the Brownie camera of 1900, marketed for $1 and taking a roll of film costing 15 cents.

As the first to market film, and the maker of the best film in the 1890s, Eastman was poised to take advantage of the introduction of x-ray photography (1896) and motion pictures. In 1889, Thomas Edison purchased 50 feet of double-thick Kodak film for his Kinetescope, a prototype motion picture machine. When projectors came into use (ca. 1895), they took miles of film. Eastman's company was the only one poised to meet these needs.

The key to Eastman's business success initially was a combination of business and marketing skills and insights, a technological orientation, continuous personal innovation of products, especially cameras, acquiring all patents that related to the company's principal products, and enforcing those patents through lawsuits. Soon he added recruiting employees with technical skills, intense and clever advertising, worldwide distribution of products, the outmaneuvering of competitors, and the raising of capital. The photographic manufacturing business was highly competitive but Eastman was able to win dominance not only in the United States but also in the United Kingdom and on the continent of Europe.

By 1900, twenty years after going into business, the company started by a bank clerk and whip manufacturer was the largest photographic materials business in the world. At the same time, Eastman's own personal technical activities ceased as he delegated many of the functions that he had earlier personally performed. He credited his talented staff with "switching Kodak Park from the empirical to the scientific path."

In 1898, Eastman refinanced the company in London, financial capital of the world, acting as his own broker against the furious opposition of London bankers and brokers, emerging with a personal profit of $1 million. He shared the profit with employees on both sides of the Atlantic—the first Kodak Bonus. This unprecedented move was later institutionalized as wage dividends (1912), savings and loan schemes (1921), stock options, and benefit and pension plans (1929). His reorganization of the Eastman Kodak Company indicated a shift in interest toward the construction of new facilities and finance.

By 1904, Eastman was pursuing techniques of color photography. The most serious effort began in 1914 with the introduction of a two-color color technique named Kodachrome that was good for portraits and still lifes but not landscapes.

The Bayer Company, a large German chemical company that employed 800 research scientists in a prototypical industrial research laboratory founded in 1891, influenced Eastman to change the focus of Kodak's testing laboratory to a research one in 1912.

Because of his burning desire for a better color process, Eastman hired the British research chemist C. E. Kenneth Mees of Wratten & Wainwright to establish the Kodak Research Laboratory (KRL). He considered Mees the world's foremost color authority because of his experience with color-sensitized plates. Mees brought with him a large contingent of Britain's best photographic scientists.

Before Mees, Kodak had a 30-year tradition of technical innovation with Eastman himself handling much of the experimental and developmental work on gelatin dry plates, photographic printing papers, and the new system of roll film. He began to control raw materials through contracts such as that with the General Paper Company. He then gradually built the capacity to produce vitally needed materials, for example, raw paper, gelatin, chemicals, and lenses. In the first decade of the 20th century, he bought twenty major photographic retail stores in large cities across the U.S. and in Canada.

While Mees's knowledge of color photography may have been the main reason that Eastman hired him, he also told Mees that his job was "the future of photography," giving him unbridled leeway to develop research along whatever lines it happened to lead. Mees and other members of Eastman's carefully selected management team ensured the future of the company.

The company's growth was based on innovation, quality control, expansion and the acquisition of know-how purchased from outside sources. Eastman often bought small companies in order to obtain superior products such as the emulsion-making formulas and services of William Stuber. But he recognized that he could not continue this indefinitely in an era when the federal government was investigating him for antitrust violations. Also, the development of new color processes required knowledge that Eastman and his staff did not have and color offered an opportunity to solidify Kodak's leadership position. In addition, Eastman desired that Kodak rank among the corporate trendsetters of his time such as Bayer.

While Eastman's historical importance rests on his roles as business entrepreneur and visionary industrialist; he was also a zealous patriot. Thus, during World War I he directed the Kodak Research Laboratories

(KRL) to lend its resources to the U. S. armed services. This resulted in advances in experimental aerial photography, camouflage (the most effective way to paint a surface vessel to avoid detection by submarines), and colloidal fuels. Most important, Eastman set up a Synthetic Organic Chemicals Department to counteract the utter dependency on German chemicals such as sensitizing dyes and photographic developing agents. By 1921, this department was producing more than 1000 specialty chemicals.

The first major post-war product from the KRL was amateur motion picture film in 1923. Eastman continued pressing Mees to market a color technology (done in 1928, prematurely). In 1920, Eastman had interviewed the young Leopold Mannes and Leopold Godowsky—who would eventually produce the groundbreaking Kodachrome film in 1935 under Mees's aegis, three years after Eastman's death.

Eastman's role as philanthropist is impressive too. His interest in Rochester projects was partly to make the city a "better place for Kodak people to live and raise a family." His rationale for founding the Eastman School of Music—"What you do in your working hours determines what you have; what you do in your leisure hours determines what you are"—could refer to his stimulus for other charitable gifts. Pragmatism and personal appeal were the foundation of his philanthropic philosophy. Trained technicians were important to his business so he became an early fund-raiser for what is today the Rochester Institute of Technology. His reliance on "the good stock" coming to Kodak from the Massachusetts Institute of Technology led him to build a new campus for MIT as an anonymous donor merely known as "Mr. Smith." His concern about preventive dentistry for children had a personal—he and his mother had poor teeth and gums—as well as a community service component. His gift of the Rochester Dental Dispensary led to an Eastman Dental Clinic in five European cities: London, Paris, Rome, Brussels, and Stockholm.

In 1920, when Rockefeller philanthropic interests, led by Abraham Flexner, proposed that he establish a medical school—modeled after Johns Hopkins University—at the University of Rochester, he readily agreed to expand his health care interests. He and Henry Strong's family founded Strong Memorial Hospital and the school/hospital complex continues as the region's largest and most complete medical center and after the Eastman Kodak Company, the area's premier employer.

Eastman owned the only old master art collection in Rochester, bequeathed to the Memorial Art Gallery of the University of Rochester. The university's Eastman School of Music is a conservatory for training performers and teachers and its Eastman Theatre, originally a silent film theater, continues as home to the Eastman-founded Rochester Philharmonic Orchestra. The musical complex had as its goal the training of listeners and the music school often leads the list when "best" music schools in the country are named.

The son of abolitionists, Eastman became his generation's greatest contributor to African American education. His early interest in technical education widened to include liberal arts, education for minorities, music education and women's education—particularly at the University of Rochester.

Despite a myriad of charitable gifts, Eastman considered his major philanthropic contribution to be the company he founded that provided so much work for so many people.

ELIZABETH BRAYER

See also: X-ray photography; Roll Film; Camera Design: 6 Kodak, (1888–1900); Kodak; Dry Plate Negatives: Gelatine; and Negatives: Non-Gelatine, Including Dry Collodion.

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EATON, THOMAS DAMANT (1800–1871)
English

Thomas Eaton was born on 19 January 1800, the only son of Thomas and Mary Eaton (nee Damant). He was educated at Norwich Grammar School and later continued his father's silk merchant's business.

Along with his literary, artistic and scientific interests, he was known as a musician and music critic. He retired from business in 1846 to devote himself to painting and photography.

His first photograph, of a Norwich church, was taken in 1845. He showed a further view of Norwich in the 1852 Society of Arts London exhibition, and three in the Norwich Photographic Society's 1856 show. He was a member of the Photographic Society of London and President of the Norwich Photographic Society and helped organise their impressive 1856 exhibition, which had an entry of over 500 images.

He used the calotype process and later wet-collodion to produce pictures of family, friends, landscape and architecture, which were mostly made in his home city. In the early and mid 1850's he contributed articles concerning photography to both *Notes and Queries* and the *Journal of the Photographic Society.*

The Eaton family were bound up with civic life in Norwich, Thomas was a member of the City Council and awarded the honor of freedom of the city.

Ian Sumner

ECONOMICS AND COSTS

Photography became commercially viable at a difficult economic conjuncture. The recession of the early 1840s deeply effected both Europe and the USA promoting autarchy and protectionism which in turn restricted the circulation of materials and methodologies in the most photographically advanced countries: Britain and France. In the USA early adoption of the daguerreotype process was favoured by the large unemployed masses. Undoubtedly the profession attracted so many since in the 1850s, photography was seen to represent a future in which huge fortunes could be made, and quickly. As in most similar instances, this was true only in a very few occurrences. While serious practitioners spent a few months learning how to make good daguerreotypes, many started completely untrained, tainting the profession's reputation. In any case, with the rapid expansion in the number of practitioners, final quality and revenues suffered, and mass merchandising was finally born.

1840s and 1850s

The first commercial studios opened in New York in 1840, soon followed by London and Paris. For £150

Richard Beard first purchased an annual license to use the process then the rights to adopt the daguerreotype in England; in 1841 opened the first portrait studio in London, and started selling licenses to a number of operators in the provinces for the astonishing sum of £1200. Obviously, it would be unrealistic for a photographer to pay that sum for a licence when the daguerreotype portrait cost one guinea, a little more than the average urban weekly wage; and the costs of setting up a studio was about an average of £1100 for building work, equipment and assistants for a final annual income of £2000. Despite the presence of these and other portrait studios in other cities, commercial photography strained under the restrictive patents covering the daguerreotype and calotype, and Talbot's patent fee for the latter was £100 for the first year and £150 each following year. What was needed to improve the situation was a larger patent-free market, fast and economical processes, and a large public forum for distribution. This arrived in the 1850s, transforming and democratizing photography.

The year 1851 marked the beginning of a new period in photography with Frederick Scott Archer's invention of the wet collodion negative which supplanted all existing methods, and was the fastest photographic process to date, and the first, in England at least, free from patent restrictions. The publication of the unpatented process led directly to the relinquishment of Talbot's patent in 1854 and bypassed Beard's daguerreotype patent by offering a practical alternative for portrait studios. Moreover it made possible to print thousands of photographic positives from a single negative. This development provided the backbone for the stereoscopic and carte-de visite industries and photography progressed from the status of a cottage industry to semi-industrialization. Photographers needed assistants who were paid an average of £150 per year, this rate referred exclusively to first-class men, and the number of talented assistants available was very small, so a percentage of the profit, or sometimes an offer of partnership, was necessary to retain them. Otherwise most assistants were paid near £50.

Manufactories quickly recognised the demand for processing equipment. Some cameras from the 1840s to 1900 were sold with a range of trays, flasks, measuring cylinders, and printing frames, plus full instructions. In 1850s the costs for a rigid camera ranged between 18 shillings and £6 while for an expanding camera was between £1 and £11 and a stereoscopic camera ranged between £3 and £6. More usually, the photographer bought what he needed for the plate size he worked with. The basic requirement was for a glasshouse studio, and a workroom. In the workroom—in which preparation and processing was carried out—daylight was filtered using yellow glass or yellow cloth to create safe conditions. In smaller studios it was not uncommon for a shed to be erected outdoors to serve as a workroom. It was possible to hire fully equipped private glasshouses at the weekly rent of 5 guineas with six lessons. For photographers working on location, or at local fairs, portable darkrooms built around wheelbarrows, darktents, and 'photographic wagons' were available, with price dependent upon the level of sophistication.

The 1850s saw an improvement in hauling transportation which consequently increased output and lowered prices, producing a wave of prosperity lasting until the early 1860s. Portrait photographers did good business in the following years but the days of vast fortunes from photography were still to come. During the whole decade, fashionable West-end photographers charged a guinea for a whole plate portrait, 3 guineas for the same size coloured, and 5 guineas for a large size, coloured. The price for a stereoscopic picture varied from 1 to 16 shillings.

In 1858 in New York, where the daguerreotype was essentially the only process used, only later replaced by the ambrotype, inexpensive and relatively simple to set up, there were two hundred studios, producing a combined annual turnover of $2 million.

1860s and 1870s

A growing consumer market demanded better-quality photographs, made more easily and cheaply, and technologies were adapted to enhance uniformity and affordability. New lenses improved image resolution and reduced exposure times, their costs ranged between 6 shillings and 16 guineas; less expensive glass-plate negatives, which cost between 2 and 6 shillings for a dozen and coated printing paper brought a new generation of inexpensive photographic artefacts. The wet collodion era and, in the U.S., post-Civil War growth attracted many people to the trade, exceeding the demand for offered services and prices plummeted.

By 1861, *carte-de-visites*, tintypes, and stereographs were being produced in their millions, and successful studios were structured like small factories, with standardized procedures and a clear division of labour, They were created with the backing of external capital, collected in the guise of a joint-stock companies, at the heart of which the photographer was at best a major shareholder, but often a merely a salaried employee.

Adolphe-Eugène Disdéri, who was reputed to be one of the richest photographers, taking 1.2 million francs (£48.000) a year, charged 30 francs for 25 *cartes* with two poses, 50 francs for 50 *cartes*, 70 francs for 100 *cartes* and 100 francs for a life-size portrait taken on a plate. In the summer of 1861 33,000 people made their living from the production of photographs and photographic materials in Paris. The same year in London the number of people earning their living from photography

had risen to 2800 and the portrait studios had risen from 66 in 1855 to over 200; in 1866 when the *carte-de-visite* craze had reached its peak there were 284. The average of a wage of a photographer was between £6.000 and £12.000, earned by Mayall who outstripped other English professionals, and the costs for a sitting was 1 guinea for twelve *cartes-de-visite* and £2 for twelve cabinets In Contrast to the impressive sum earned by a large number of photographers, their assistants, who worked from 8 am to 6 pm, received on the average £2 to £3 per week. The top wage for the first-class studio operators was £250 per year. They were required to work both before and after the image had been taken, chemists were needed to prepare negatives, printers to develop the proofs, labourers to colour and stick the prints. In Paris in the mid-1860s the number of studios employing more than ten people was less than ten per cent. Small, family-run concerns, with one or two employees, were still more numerous by far during this period, even though there were photographers like Nadar and Disdéri who employed the up to 50 assistants and 80 assistants respectively.

Photographic art reproductions tapped into the growing middle-class who could afford photographs of themselves in the same elegant and luxurious surrounding of the nobility. They started collecting, and this marked boomed after 1865, when new pigment and photomechanical processes such as carbon and Woodburytype facilitated stable and relatively inexpensive photographic reproductions, even though the patent fee for this process was still high as Goupil & Co. of Paris acquired the rights for France for 150.000 francs (then £6.000).

Mass-produced photographs were finally so inexpensive that only the largest firms could profit from them, and as the market became saturated with each new product type, prices dropped. In the 1860s overproduction and economic stagnation reduced prices and competition was fierce, studios turned to larger formats such as cabinet cards.

At the height of the *carte-de-visite* period, 300 to 400 million *cartes* were estimated to be sold annually in England. So great was the number that more than one Chancellor of the Exchequer contemplated, following America's example, materially adding to the national income by a small tax on each photograph. Between 1864 and 1866 Americans had to affix a stamp to the back of all photographs, ranging in value from 2 to 5 cents. Gladstone considered a penny tax in 1864, and so did Disraeli in 1868, when it was stated that a penny stamp on the roughly 5 million photographs sold annually would help in the prosecution of the Abyssinian war. This lower figure illustrates clearly the decline in the demand of *cartes.*

The situation worsened in the 1870s with a severe depression on both sides of the Atlantic, aggravated by war. In Paris, many studios went bankrupt during the Prussian siege and the mayhem of the Paris Commune drove wealthy clients out to the provinces. The last thirty years of the 19th century were marked by economic fluctuation, with a decline in output between 1875 and 1884, and recession in 1873 and 1893. The photographic market had been held back by the perishability of materials, inhibiting standardization and mass production, and the relative complexity of products had restricted the amateur market.

1880s and 1890s

The market changed again with the commercial introduction of gelatine bromide dry-plate negatives and printing papers in the 1880s. Few photographers had the necessary time or skill to use this process, so commercial manufactures took on the production of ready-sensitized materials, whose adoption was slowed by high prices, technical inconsistencies, and the need to light-proof apparatus and darkrooms. Cameras became simpler and cheaper, their cost ranged between £5 and £32. Eastman's core business was film and paper, and the cameras were essentially vehicles to increase demand; the company's processing and printing services cost up to 50 per cent of the initial outlay for a camera. The prices charged by the leading firms for gelatine dry plate were between 3 shillings to £1 and 6 shillings per dozen, depending on size, in 1880 and between 1 and 10 shillings per dozen in 1890.

From 1880 the growth of the studios in London was in line with the population and fluctuated between 260 and 280 with a pick of 340 in 1900. The amateur market grew steadily, as social mobility and disposable income increased, and a gradual reduction in working hours produced a boom in leisure activities. Existing photographic associations were reinvigorated and new amateur clubs started; their numbers grew tenfold from1880-90. Women became a notable constituency: as early as 1886, women's magazines carried photographic advertisements and from 1889 Eastman publicity illustrated women using Kodak cameras. The importance attached to advertising is indicated by the fact that Kodak in Britain spent nearly £5.000 on advertising to persuade amateur photographers to spend more or to buy their product in preference to another. In the mid-1880s advertising was absolutely crucial in the fledgling market for amateur photography to flourish. Traditionally photographic goods had only been advertised in specialist publications, aimed at a limited audience. By 1900, women made up 30 per cent of British amateur photographers, and the US census listed more than 3.500 female professionals. At the end of the 19th century, with the spread of the dry-plate process and the simplification

of photographic techniques and equipment, the number of amateurs grew considerably.

The later 1890s were generally prosperous, but there remained few patentable mass-market inventions, so profit margins were low and manufactures fought price wars. The professional portrait trade was saturated with *cartes* and cabinet cards, and now also competed with postcards and home snapshot portraiture. The popular press was one of the signal influences of this time, serving more widely enfranchised and educated population. Inexpensive illustrated papers and periodicals were made possible by the new photomechanical processes, which afforded cheap, good-quality reproductions.

Photography finally appeared to have come of age. Technically reliable, in the hands of professionals, sustained by rapidly expanding methods of circulation, it had, within the space of five decades, conquered the principal fields of human activity.

Elisa Canossa

See also: Markets, Photographic; Patents: Europe and the United Kingdom; Patents: United States; and Photography as a Profession.

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EDER, JOSEPH MARIA (1855–1944)

Austrian technologist, scientist, photo-historian, and teacher

Eder, Joseph Maria was born on March 16, 1855 in Krems on the Donau. He was the son of Karolina from the Borudzkis Polish. Eder was an. He studied natural science at Vienna University, and later at Technischen Hochschule. In 1879 he received his PhD degree, and became an assistant professor in 1887, a professor in 1892, and then became a professor at the department of photochemistry and scientific photography in 1902. From 1882–1924 Eder was a professor of chemistry and physics at a high school (Gewerbeschule) in Vienna. Eder was the founder of and from 1888 to1923, the director of *Lehranstalt für photographie and reproduktionsverfahren,* which is called today Höhere Graph. Bundes-Lehr- und Versuchsanstalt, in Vienna. He directed studies on photometry and x-ray photography.

Under his management the School became the most respectable centre of research within the scientific photography in the world. During his studies he and V. Toth, working with elementary components of chemistry, invented prussian blue, intensifying lead and ferrizyaniden for colour. About 1879 he was worked together with G. Pizzighelli on activity of chlorosilver gelatine: *Die Photographie mit Chlorosilber-Gelatine und chemischer Entwicklung, nebst e. prakt. Anleitung zur raschen Herstellung von Diapositiven, Stereoskopbild. Fensterbild., Duplikatnegativen, Vergroesserungen, Copien auf Papier etc. Wien 1881.* The production of sensitive paper and positive film used in cinema was available because of these two industrial inventions.

J.M. Eder was also interested in sensistometry (Eder-Hecht Wedge in 1919), but prior to the introduction of the DIN speed rating system, it was used in Europe as a component of a standard sensistometer, Eder and Schneider sensistometr, Optical sensynsybilation, method to define panchromatic Eder and Hecht. Chemical and physical developing process—pyrocatechol developer and ferrioxalate. Sensibility properties of erythrosine (1884). His great scientific accomplishment appeared in more than 21 books and 11 articles published mainly by Wilhelm Knapp in Halle am Saale 1878–1932. The book with the largest influence on the world of photography have been: *Ausfuhrliches Handbuch der Photographie*. This compilation went through three editions: 1882–1888 in Halle (13 issues in 8 volumes), 1891–1899 with new material and issues (17 issues in 15 volumes), 1905–1932 another elaboration (18 issues in 11 volumes). The second edition in 1891 was began with *Geschichte der Photochemie und Photographie von Alterthume bis der Gegenwart,* which was a fundamental necessity for the explorers of photography in 1891.This book was published again in 1905 as *Geschichte der Photographie* and was three times larger than the first edition. In 1913 a less known *Geschichte der Photographie in Bildern* and *Quellenschriften zu den fruehesten Anfaengen der Photographie bis zum 18. Jahrhundert*, was published. Eder was the editor of *Jahrbuch für Photographie und Reproduktionstechnik für das Jahr...* Halle 1892–1914 and *Jahrbuch...* und *Reproduktionsverfahren fuer Jahre 1915–1920*. In those periodicals he was talking about the scientific research in the world of photography. From 1888 he was assistant

editor, and from 1903 was a member of the committee of *Photographische Correspondenz.* The first publication, *Ueber die Reactionen der Chromsaeure und der Chromate auf Gelatine, Gummi, Zucker und andere Substanzen organ,* was printed in 1878, and investigated emulsion- gelatin development. On his last work, he collaborated with Adam Trumm's and his editorial abilities in 1932 and created the closing chapters of the book, *Handbuch der Photographie: um Heliogravuere and the Platinotypie.*

Since 1900, he had been delivering lectures on the development of the photography in "Vereins zur Vorbereitung naturwissenschaften Kenntnise" in Vienna. The level of his knowledge facilitated him lecturing about photography at The Science Academy. In 1879–1915 he published five articles in S*itzungsberichten der koeniglichen Akademie*. To this important inventions belonged like the application of pyrocatechol as developer reducer as foung in *Der neue Eisenoxalat- Entwickler und dessen Vergleichung mit dem Pyrogallus-Entwickler. Wien 1880. Verlag der Photographische Correspondenz.*

Together with Eduard Valenta (1857–1937), he published the method of using W. Roentgena's process for taking photographs. Roentgena's photographs were kept as x- rays, "Christiceps argentatus," and the negatives were put in a collection at the Eastman Kodak Company in 1922 from the J.M. Eder and "Aesculap-Snake Vienna 1896" in Private Collection, in Vienna. Another was reproduced in the book *Versuche ueber Photographie mittelst der Roentgen'schen Strahlen. Hersg. mit Genehmigung der k.k. Versuchs- Anstalt fuer Photographie und Reproduktions- Verfahren in Wien. Halle 1896. With 15 Photogravuren in x-rays.* With E. Valenta describing Spectralanalyse in *Beitraege zur Photochemie und Spectralanalyse. Wien 1904* and the methods of research of sensistometric negativebeing published in *System der Sensistometrie photographischer Platten. Wien 1899–1902*, thousands of photographers were using Eder's book *Recepte und Tabellen fuer Photographie und Reproductionstechnik, welche an der k.k. Lehr- und Versuchsanstalt fuer Photographie und Reproductionsverfahren in Wien angewendet werden.* This book too had 25 editions between 1892–1949. *Theorie und Praxis der Photographie mit Bromsilber—Emulsionen unter bes. Beruecks.d. Gelatine–Emulsionsverfahrens. Wien 1881*, had two editions, and from 1884–1888, he wrote four books on the instantaneous photography and he described a new light meter in: *Ein neues Graukeil-Photometr fuer Sensitometrie, photographische Kopierverfahren und wissenschaftliche Lichtmessungen. Halle 1920.* Eder died in Kitzbühel on 18 October 1944.

JACEK STRZAŁKOWSKI

See also: Sensitometry and Densitometry; and Kodak.

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EDINBURGH CALOTYPE CLUB

The calotype process of photography arrived in Scotland at the time of its invention in 1839 due to the friendship and shared scientific interests of the inventor, William Henry Fox Talbot, and the Principal of St Andrews University, Sir David Brewster. However, it was not just in St Andrews that experimentation with the process began but in Edinburgh where it is claimed the first photographic club in the world was formed: the Edinburgh Calotype Club.

Brewster was instrumental at the start of the Club but in addition helped with it activities, not least by persuading Talbot not to extend his patent for the process to Scotland in 1841 so that it could be freely used by the Scottish enthusiasts.

John Miller Gray, the first keeper of the Scottish National Portrait Gallery, wrote:

> Shortly after the first discovery of the Calotype by Talbot, and its communication by the inventor to Sir David Brewster, a few Edinburgh gentlemen visited the latter, saw his set of Calotypes, and were made aware of the method by which they were produced. On their return they entered eagerly on the study, and formed a little Calotype Club…

A references by Brewster in a letter to Talbot dated 5 October 1841 indicates that the Club may have been active by that time. Despite having Talbot's instructions, problems were experienced in producing successful results by those experimenting with the process. Brewster, in his letter describes the slow progress of Dr John Adamson with the calotype process in St Andrews but also states that "difficulties have been experienced by several persons in Edinburgh."

It is Gray that gives an insight into how the Club was organised when he writes:

> The constitution of the Club was of a very frank and informal kind. The members met at each other's houses, had a friendly meal together, exhibited their productions, and discussed new experiments and their results.

In an obituary to Cosmo Innes, one of the founders and most active members of the Club, the British Journal of Photography reported that "the Calotype Club, thus constituted, continued its pleasant labours throughout the calotype and waxed paper period."

The membership of the Club was small with at least seven principal members, mainly associated with the legal profession, and a few others who were involved from time to time, and one was a woman. The close relationship between the Club and those active in photography at St Andrews persisted and in the two extant albums of the Club there are prints by Dr John Adamson and Sir Hugh Lyon Playfair. There are also prints by Talbot and the most likely source for these would have been Brewster.

The known members of the Club are: John Cay (1790–1865), advocate and Sheriff of Linlithgow; Cosmo Innes (1798–1874), advocate and Sheriff of Moray; George Moir (1800–1870), advocate and Sheriff of Ross; James Francis Montgomery (1818–1897), advocate and later a clergyman; Mark Napier (1798–1879), advocate and Sheriff of Dumfries; John Stewart (1813–1867), estate owner; and Hugh Lyon Tennent (1817–1874), advocate. Associated with the Club were: Sir James Dunlop (1830–1858), student and later soldier; his aunt, Mrs Frances Monteith (1805–1898) who was the wife of Alexander Earle Monteith and advocate and Sheriff of Fife; James Calder Macphail (1820–1908), Free Church divinity student and clergyman; and Robert Tennent (1813–1890) brother of Hugh and owner of land in Australia.

The two known albums of photographs by the Club members and their associates are in Edinburgh. The one in the Edinburgh Central Library belonged to James Francis Montgomery and was acquired from his descendants in 1952. The other is in the National Library of Scotland and was bought at auction in 2001. This is accompanied by an index which has thrown new light on the Club as it gives a description of the images and has a key for the initials that appear beside most of the photographs giving the names of the photographers. There was at least one other album as Gray mentions seeing an album with photographs of places which are not in either of the known albums. The photographs by Mrs Frances Dunlop, which include her nephew Sir James Dunlop, are in an album which belonged to Brewster that is now in the J. Paul Getty Museum, Malibu.

In its loose arrangement the Club survived until 1856 when its members were largely responsible for founding the Photographic Society of Scotland. At the meeting held to consider forming the Photographic Society of Scotland in March 1856, the motion to do so was moved by Cosmo Innes and seconded by George Moir. At the Society's first exhibition later that year Innes exhibited several of his prints by the calotype process.

RODDY SIMPSON

See also: Amateur Photographers, Camera Clubs, and Societies; Brewster, Sir David; Calotype and Talbotype; Dunlop, Sir James; Innes, Cosmo; Adamson, John, Talbot, William Henry Fox; and Salted Paper Print.

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EDISON, THOMAS ALVA (1847–1931)

American inventor, manufacturer, and cultural icon

The development of a celluloid film band 1⅜ inches wide for the Kinetograph camera and Kinetoscope viewer of Thomas Edison, developed at his laboratory in West Orange, New Jersey, by a team led by William Kennedy Laurie Dickson, is Edison's lasting contribution to the worlds of both moving pictures and photography. Later known by its metric equivalent as 35mm film, Edison's chosen format of 1894 is still the principal moving picture film width after 108 years, and became an ubiquitous format for still photography beginning in the 1930s with the introduction of lightweight single-lens-reflex cameras. The width of this film, and its four perforations per image on both sides of the band, have been virtually unaltered since late 1891, and as early as 1897 this size of moving picture film was referred to as "standard film" or "Edison standard film," even as numerous other formats competed in a still-fluid marketplace. As Paul Spehr has carefully documented (see Further Reading, below), Edison's work on "an instrument which does for the Eye what the phonograph does for the Ear," as the inventor expressed it in a Caveat filed with the U. S. Patent Bureau in 1888, moved through a series of stages: sheet celluloid wrapped around a cylinder, celluloid plates mounted around the edge of a revolving disk, 22mm film perforated on one side running horizontally in the camera, and 1 inch film perforated on both sides running vertically in the camera, which was finally resolved as a thicker 1⅜ inch wide band. In developing their moving picture system and its photographic celluloid, Edison and Dickson had the advantage of working in a unique and intimate relationship with George Eastman and his colleagues in Rochester, New York; no other moving picture pioneer commanded such industrial respect that a major photographic supplies firm entered into the kind of intimate and arduous partnership shared by Edison and Eastman that was necessary to develop a new photographic material.

From their earliest experiments in moving pictures, Edison and Dickson used transparent celluloid covered on one side with a photographically sensitive emulsion.

The celluloid base provided flexibility for the image carrying emulsion, while its transparency allowed the development of a viewing apparatus using transmitted light, where the image carrier moved between the light source and the viewer. The technical considerations in the evolution of 35mm film included making the image area as large as possible for comfortable viewing, while keeping it small enough to produce a compact apparatus, and making the film tough enough to withstand the mechanical stresses of running at 30 to 40 frames per second across the viewing aperture while simultaneously keeping it light enough to have the flexibility to wind through the machine. The changes Edison and Dickson made to the design of their Kinetoscope viewer and Kinetograph camera were direct responses to these constraints: the sheet celluloid film from Carbutt wrapped around a cylinder had images that were too small; the celluloid plates on a revolving disk copied from the Anschütz Schnellseher provided too limited a viewing time; half-inch and three-quarter-inch film perforated along only one side was not robust enough to withstand the stresses applied by the machinery; one-inch film perforated on both sides left too little room for the image. During this period of experiment and evolution between 1888 and 1894 at the Edison laboratory, Eastman also had technical issues to solve, even though his company was the world's most experienced in manufacturing flexible rolls of photosensitised film. Roll film had been introduced by Eastman with an opaque paper backing in 1884, and his Kodak roll film system was an instant success from 1887, so much so that a substitute for its original opaque backing was urgently sought, since the elaborate process of handling this "stripping film" overwhelmed Eastman's developing and printing service. Celluloid nitrate, despite its flammability, was the solution to Eastman's dilemma, but until well into the 20th century every time the photographic emulsion was chemically changed to improve its sensitivity or decrease the grain size and provide better sharpness, previously overcome problems of adhesion between the emulsion and the celluloid base reappeared, often in conjunction with thin cobwebs of exposed emulsion caused by static electricity in the manufacturing process, or other imponderable problems.

The resolution that Edison and Dickson finally made used 35mm wide strips of celluloid-backed emulsion that was slightly thicker than Eastman's still camera film, and was produced and cut—as it was later for other early moving picture companies—to special order by Eastman at a premium price. With the Kinetoscope in use in public from 1894, Edison used this film principally for camera negatives made by the Kinetograph, since was a very clear stock manufactured by pouring out on long glass tables. For positive prints in the Kinetoscope viewer, film from the Blair Camera Company was used since it was slightly translucent and therefore better dispersed the light across the image for the viewer; Blair used a different manufacturing process of continuous casting on a large heated rotating drum.

Although it is often overlooked in studies by film historians, like its predecessor moving picture apparatus, the Schnellseher of Ottomar Anschütz, and like many subsequent moving picture machines such as those of the Lumière brothers, Robert W. Paul, Birt Acres, George W. de Bedts and other pioneers, when the Edison Kinetoscope and Kinetograph system first appeared it was considered revelatory apparatus for the making and exhibition of photographs, and was conceptualised wholly within the enormous technical advances being made by photography in the last quarter of the 19th century. Reviews of the Kinetoscope commonly referred to the astonishing fact that 46 individual pictures were taken in a single second, or that a Kinetoscope view was made up, on average, of over 1200 photographs. Pratitioners in the fast-moving realm of photography, whether manufacturers, suppliers or end-users, had been remarkably agile in responding to new technological developments, including the public fashion for stereoscopy in the 1860s, the expansion of photographic lantern lectures in the 1870s and the introduction of the Kodak system and roll film in the 1880s, but the moving pictures introduced at the end of the 19th century proved to be a step too far for the already prosperous industry, and moving picture work quickly evolved to become a separate realm that would dominate public discourse in the 20th century.

DEAC ROSSELL

Biography

Born in the small town of Milan, Ohio, in 1847, the young Thomas Edison was expelled from school as "retarded" and educated at home by his mother. He went to work at the age of 12, selling candy and his own on-board newspaper to railroad passengers travelling between Detroit and Port Huron, Michigan, where the family had moved. He trained himself as a telegraph operator, took a job with Western Union in Boston, and soon was repairing telegraph apparatus. He executed his first patent, for an electrical vote recorder, in 1868 and the next year became a full-time inventor, moving from Boston to New York City and concentrating on telegraphy. By 1874 his work had created a new duplex telegraph, which allowed a single wire to carry two messages simultaneously, and then a quadruplex system which allowed four concurrent messages, significantly improving both the efficiency and the capital costs of telegraph communications. Now working for some of America's largest corporations, he constructed his own independent research laboratory at Menlo Park, New

Jersey in 1876, the world's first, and began to develop a commercially viable carbon telephone transmitter. He patented the cylinder phonograph in 1877, intending it for office dictation, and his experiments on electric light systems began the next year. Edison's high-resistance carbon filament lamp was patented on 1 November 1879, and over the next three years he patented some 111 electrical devices ranging from generators and batteries to lamps and electric-powered railroads. At the same time he began constructing demonstration electrical stations and commercially manufacturing lamps and other electrical apparatus. Moving his laboratory to larger quarters in West Orange, New Jersey in 1887, his fertile workshop continued to invent and patent a large number of products including storage batteries, magentic ore mining apparatus, and a camera with its moving picture viewer called the Kinetoscope. Amongst the scores of domestic and international firms established to promote and exploit his work, The Edison Electric Light Company eventually evolved into the General Electric Company, and the Deutsche Edison Gesellschaft became the Allgemeine Elektrizitäts-Gesellschaft (AEG). By the early 1900s his advice was sought by businessmen from all sectors of the economy, while his unusual gift for describing new technologies in a simple turn of phrase turned him into a favourite of the press and the public alike. His rags-to-riches story had an immense appeal: the first of many biographies was published in 1879, when he was only 32, and Edison was a leading character in a French science-fiction novel by Villiers de l'Isle-Adam in 1886. His last patent application was filed in 1931, the year he died, and his life and work were promptly memorialised in hagiographic films from Hollywood, first in *Young Tom Edison* with Mickey Rooney as the inventor and then in *Edison the Man* starring Spencer Tracy (both 1940).

See also: Emulsions; and Eastman, George.

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EDLER, ANTON (1798–1856)

German daguerreotypist

Anton Edler, born in 1798 in Munich, was first a draughtsman, lithographer and engraver. From 1813 he worked in a surveying office of the Bavarian Army drafting the topographical atlas of Bavaria and maps of Munich. In the process he fell victim to an eye illness and was pensioned in 1850. Although he stoped his drafting work, he continued to photograph, having in 1840 begun practising the daguerreotype, taking mainly portraits. In 1854 he contributed daguerreotypes and calotypes to the *Deutsche Industrieausstellung* [German Industrial Exhibition] in Munich. Edler died on 20 May 1856. His photographic work is preserved in the *Deutsche Museum* Munich and the *Stadtmuseum* Munich.

STEFANIE KLAMM

EDUCATION AND TRAINING IN PHOTOGRAPHY

The roots of photographic education and training go back almost as far as the first public announcement of photography in 1839. By October of the same year, the Polytechnic Institution in Regent Street, London was advertising lectures on the daguerreotype process by its resident chemist Mr. J. T. Cooper three times a week.

In the early days photographers were self-taught. Frequently it was a hit and miss affair but those with backgrounds in chemistry and physics were able to decipher the processes with the minimum of information. J. B. Dancer of Manchester explained the problem: 'The early descriptions of Daguerre's method of proceeding were crude and obscure. In consequence of this I had six weeks of hard work, numerous failures, and accidentally was nearly suffocated by the vapour of iodine before I obtained satisfactory results.' As a 'practical optician' Dancer was able to construct his own camera and lens. By 1841 he was able to supply 'daguerreotype apparatus' and taught the process 'to Manchester gentlemen who became amateur photographers.' (Dancer, 1886)

Photography became a popular pursuit with the relaxation of Talbot's patent in July 1852. With that increase in amateur sales came the need for instruction of the fashionable hobby. By the following spring, classes were available from T. A. Malone at the Royal Polytechnic Institution, Philip H. Delamotte at the Photographic Institution in New Bond Street and Nikolaas Henneman

at the Panopticon of Science and Art in Leicester Square. In this Moorish-style building a lift took visitors to the photographic saloon that was 18 metres long 'enabling family groups of eighteen persons to be taken at once. In addition, completely equipped private glasshouses could be hired by amateurs at a weekly rent. The charge for instruction was five guineas (£5.25) for six lessons. The London School of Photography opened in 1854 at 103 Newgate Street, London. It had branch studios for the taking of portraits in Regent Street, Oxford Street, Poultry in the City, as well as Church Street, Liverpool and Market Place, Manchester.

It was also the written word and word-of-mouth that promoted photography. Alfred Brothers bought 'photogenic paper' consisting of a few sheets ready sensitised with nitrate of silver from a bookseller in Maidstone. He had previously read of Talbot's experiments and had used nitrate of silver and had coated his own sensitive papers. Later, probably in 1855, having seen 'a beautiful photograph on glass' in the window of Casartelli (Opticians) he bought 'a quarter plate camera with a portrait lens and necessary materials' and was shown how to coat a wet plate by them. It was this training and experimentation that allowed him to set up as a professional photographer the following year and by 1857 was invited to take the photographs of the Royal Family at the opening of the Manchester Art Treasures Exhibition.

Photography was taught to the Royal Engineers at Chatham from 1856 at later at Woolwich and other military and naval establishments. This training was invaluable for officers trading in India and was encouraged by the East India Company, acting on instructions from Lord Canning, the Governor-General. Books on the people, landscape and cultural inheritance of India resulted from this open-minded policy with the photographs being almost always being taken by Captains of the Royal Engineers.

The University of London introduced photography into its curriculum at Kings College. A large darkroom was erected and T. F. Hardwich, author of the first manual of photographic chemistry (1855), was appointed. Thomas Sutton, editor of *Photographic Notes*, and Philip H. Delamotte succeeded Hardwick some five years later when the department of photography was split into science and art respectively.

The first examinations in photography were organised by the City and Guilds of London Institute. Photography was one of the seven original subjects examined with a syllabus published in 1880 and the first examinations held in 1881. Three levels of examination were listed: these being at Elementary, Advanced and Honours level. The syllabus itself was theoretical and was divided into eight sections: four of which dealt with the chemistry of various processes, one with optics and cameras, one with apparatus and two with the special applications of photography. These included engraving, typography, lithography, astronomy, microscopy and meteorological recording.

By 1871 one commentator suggests the way forward for the training of the future photographer. The key is 'the art portion of our art-science' and the suggestion is that there is a fundamental difference between the education of the fine art student and the photography student, a discussion that in one form or other has continued ever since. For the photography student it is important that he finds 'that everything in outline and light and shade can be executed by the lens in his camera…. All efforts have to be given to a general cultivation of his thinking powers… and once duly impressed with the conviction it is the head not the hand which has to work, then a steady perseverance in the right direction will… lead to ultimate success.' He continues to suggest the study of pictorial illustration of figure subjects, harmony and outline, light and shade and 'the expression of the hand.'

Considering the photographer of the future in 1873 another commentator observed: 'In order to keep pace with the demands and requirements of an improving public taste, it is essential that the photographer possess other abilities and accomplishments than technical skill. He should thoroughly comprehend the laws and principles that govern all pictorial art, leaving nothing to chance and the camera in that respect. He should not be entirely ignorant of the chemical and optical sciences, and be possessed of a quick and exalted imagination, in conjunction with a profound knowledge of human nature and a practical acquaintance with every grade of social life, that he may understand and be at ease with all sorts and conditions…. In fact to be a successful artist-photographer involves the necessity of perseverance and indefatigable study, without which none ever attained success in any art or science….' (Raven, *The British Journal Photographic Almanac*, 1873).

By 1880 the Polytechnic Institution was bought by Quinton Hogg and renamed the Regent Street Polytechnic. From November 1882 the first technical classes in photography took place on a Saturday evening as a series of thirty lectures. Mr. E. Howard Farmer who was to stay with the Polytechnic as its first head of the School of Photography until 1919 gave these lectures. Outside of the Polytechnic he would best be known for the 'Reducer' named after him. By 1896–97 mention is made of the 'large, highly successful classes at the Polytechnic' while in 1895 the records of the Technical Education Board credit the school of photography with 472 students. (*Greater London Record Office*, July 1895)

While formally outside the timescale of this entry it

is worth noting that in Britain the Professional Photographers Association was formed in March 1901 with the aim of 'Improving the status of those who practice photography in the profession.' In 1905, it prepared a scheme for granting certificates of competency to operators and assistants.

MICHAEL HALLETT

See also: Dancer, John Benjamin; Delamotte, Philip Henry; Henneman, Nicolaas; Sutton, Thomas; and Farmer, Howard.

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EDWARDS, J. D. (b. 1831)

American photographer

New Orleans photographer J.D. Edwards is best known for a series of photographs of Confederate forts, guns, barracks, shipyards, camps and soldiers that he took in and around Pensacola, Fla., in April 1861.

Born in New Hampshire around 1831, Edwards may have been the daguerreian artist listed with the rooms at 91½ Fourth Street in St. Louis in 1857. His wife, Mary, was a Missourian by birth. In 1860, Edwards was 29, with a wife and young child, working in New Orleans as an "ambrotype portrait" maker. That year, he also made a series of photographs for the government showing the construction of the new Custom House and the Marine Hospital.

In April 1861, with Union forces still occupying Fort Pickens in Pensacola Bay, Edwards traveled there to photograph the burgeoning Confederate presence. After returning to New Orleans, Edwards began selling the images at $1 a copy on May 15. "They are very large and taken superbly," a newspaper advertisement said. A month later, woodcut engravings of Edwards's images appeared in Harper's Weekly. Edwards reported having taken 39 views, but 44 different images are known, and the actual total may reach nearly 70.

All trace of Edwards is lost after 1861; and even the date of his death remains unknown.

BOB ZELLER

EGERTON, PHILIP HENRY (1824–1893)

Philip Henry Egerton is believed to have originated from Wrexham in North Wales, and to have married—for the first of three times—in 1857 before being posted to India as a member of the Bengal Civil Service based initially in Calcutta. He subsequently married again in 1886 and 1890.

It was while he was in India—as Deputy Commissioner for Kangra, North West of Simla in Himachal Pradesh—that he published his only collection of photographs. The 1864 book, *Journal of a Tour through Spiti to the Frontier of Chinese Thibet* was published in London by Cundall, Downes & Co. containing thirty seven tipped in 10" × 8" albumen prints from photographs taken during a three month expedition though the mountains of Himachal Pradesh in the summer of 1863. His journey had been a semi-official trip to explore possible alternative routes for the transport of wool from mountain farmers, and as part of it he visited and photographed the town and people of Spiti, and took the first photographs of the Bara Shigri Glacier a few miles from the town. His photographs of the spectacular mountain-top Kee Monastery attest to his ability with the collodion process.

A complete copy of *Journal of a Tour through Spiti to the Frontier of Chinese Thibet* is preserved in the Harry Ransom Humanities Research Center at the University of Texas, Austin.

JOHN HANNAVY

EGYPT AND PALESTINE

Napoleon's invasion of Egypt in 1798 ignited a Western obsession with the Orient—both ancient and modern—that resonates even today. Much this obsession was focused on Egypt, with its ancient wonders and mysteries, and Palestine, the Holy Land, the land of the Bible. It was manifested by the birth and evolution of Egyptology as a scholarly and scientific discipline, the rise of a popular appetite for anything relating to Ancient Egypt ("Egyptomania") that remains unabated, and in the emergence of an intellectual and artistic fascination with Middle Eastern life, thought, culture and customs included under the broad rubric of Orientalism. Despite the unwelcoming climate and the rigors of travel there, Egypt and Palestine became destinations for travelers of all persuasions—scientists, adventurers, entrepreneurs, but also tourists—and books describing both the sights and experiencing of the Middle East found an eager and steady market. Visual documentation, however, was less available. When photography was introduced in 1839 it was logical and inevitable that the camera would soon be applied to recording the wonders of Egypt and the holy sites of Palestine, despite the challenges of working the early photographic processes in even

the most hospitable conditions. Indeed, photographs –daguerreotypes—were made in Egypt in November 1839, less than four months after the workings of the daguerrotype process were first made public. Over the next 50 years at least 250 amateur and professional photographers are known to have been active in the Middle East, although the actual number was probably somewhat greater; the introduction of amateur roll-film cameras in 1888 undoubtedly increased those numbers substantially by the end of the century.

The history of photography of Egypt and Palestine in the 19th century breaks down into four more or less distinctive but overlapping periods, and the personalities involved include dedicated amateurs, both tourists and residents (who were usually missionaries or diplomats); trained as well as untrained men associated with archaeological or other officially sponsored projects; and professionals, both European and local, some based in Europe, others with studios in Cairo or Jerusalem or some other Middle Eastern city who catered to both the tourist and arm-chair traveler trade. The first period, 1839 to the mid 1840s, is marked by efforts to use the daguerreotype process—some successful, other total failures. The second period, spanning the late 1840s and extending into the early 1860s is defined by photographers using either paper or glass supported negative processes to produce bodies of work usually (but not always) intended for distribution in some form. The third period is marked by the proliferation of local-based professional studios associated with the tourist industry and the production of visual souvenirs that begins in the early 1860s and extends into the late 80s, when the Kodak and similar cameras using commercially made plates and films enable travelers to take their on photographs. The fourth and final period extends into the present day and is marked by the dramatic rise and popularity snapshot photography and the resulting decline and demise of professional studios catering to the tourist trade. Throughout the 19th century, French photographers predominated, with British second, Germans and Austrian third, and other nationalities, including Americans, Greeks and locals (most of whom were Christians) comprising the balance.

The first period was brief and included only a small group of individuals who were able to produce successful daguerreotypes in the difficult conditions of the Middle East. The Frenchmen Frédéric Goupil-Fesquet and Horace Vernet, and the Swiss–born Canadian Pierre Gaspard Gustave Joly de Lotbinière took the first daguerreotypes made in Egypt in November and December 1839, barely three months after the process had been announced in Paris. (Vernet claimed to have taught the Pasha, Mohammed Ali, to make daguerreotypes.) Some of the plates made by these three men were reproduced as engravings in N.P. Lerebours' *Excursions Daguerriennes* (1842), and several views by Joly de Lotbinière of ancient Egyptian monuments were transplated into lithographs for Hector Horeau's slightly earlier *Panorama d'Égypte et Nubie* (1841). These were the first photographically derived—and therefore unquestionably authoritative—representations of Middle Eastern scenes to reach the European public. Joseph-Philibert Girault de Prangey (in Egypt 1843/44) and André-Victor-Alcide-Jules Itier (in Egypt 1846/46) were amateurs who made daguerreotypes to document their travels for purely personal consumption; their collections descended in their families and have remained largely intact into recent years. Goupil-Fesquet, Vernet, Joly de Lotbinière, and Girault de Prangey also included Palestine in their travels and made souvenir views there (Girault de Prangey made more plates of Jerusalem than he did of any Egyptian site), while the only British citizen known to have daguerreotyped in the Middle East, George Skene Keith, a Scot and the brother of Thomas Keith, spent five months in Palestine with his father, a clergyman, and made daguerreotypes views of sites mentioned in the Bible that supposed offered proof of the validity of old Testament prophesies. Keith's plates are known from the steel engraving copied from them that illustrated his father's book, *Evidence of the Truth of the Christian Religion Derived from the Literal Fulfillment of Prophecy Particularly as Illustrated by the History of the Jews and the Discoveries of Modern Traveller* (1844). (French images, even of Biblical subjects, tended to be devoid of religious motives; whereas the work of both British and American photographers often had religious implications.) Few would-be daguerreotypists, however, had the determination or the skill to work the process in the field; a few, among whom was the preeminent German Egyptologist Karl Richard Lepsius, found it impossible. Such practical problems, coupled with the labor-intensive and therefore expensive effort required to produce accurate reproductions of the daguerreotype image for publication, that what photography was done in Egypt and Palestine before the first photographers using negative processes appeared in the late 1840s, had little lasting impact.

The late 1840s into the early 1860s was the Golden Age of photography in Egypt and Palestine, and it generated several bodies of work considered key monuments in the history of photography. This period began when photographers using one of the paper negative processes (calotype or waxed paper processes) began to work in the Middle East; when it ended, they were making glass plate negatives using the wet collodion process. The Rev. George Bridges, an English clergyman who began a seven year Grand Tour of the Mediterranean in 1846, may have been the first make calotypes in the Middles East, although he cannot be placed in Jerusalem until November 1850 or in Egypt until January 1851. Bridges

supposedly made 1700 photographs in the course of his grand tour, and published a number of them as original prints after his return to England, but he was not a technically proficient photographer and most of his surviving prints are in poor condition. Pierre Trémaux, a French architect who spent seven years in North Africa and the Near East beginning in 1847, has an almost equally strong claim to being the first to make calotypes in the Middile East. Trémaux intended a monumental book illustrated with original salt prints made from his negatives, but *Voyages au Soudan Orietental, dans l'Afrique Septentrionale at dans L'Asie Mineure, Executes en 1847à 1854* was apparently never completed, though parts were published. The rare surviving examples of Trémaux's work are in poor condition, and it is clear he was neither especially talented nor skilled, but his *Voyages* was the first of the photographically illustrated works on Egypt, Palestine and other areas of the Near East subsequently by the more gifted photographers of this period. Maxime DuCamp, traveled throughout the Orient 1849-50 in company with Gustave Flaubert, the French novelist. DuCamp sailed up the Nile as far as Abu Simbel in Nubia, and went on to photograph in Palestine and Syria. The result of this tour, *Egypte, Nubie, Palestine et Syrie* (1852), is an album containing 125 salt prints made from the original negatives by Blanquart-Evrard in Lille, that is one of the major—and best known works of 19th century European photography. Félix Teynard, a civil engineer, travelled up the Nile as far as the Second Cataract, above Abu Simbel in Nubia, in 1851–52. He took 160 negatives, and when he returned to France began to sell prints from them in installments. The photographs in *Egypt et Nubie, Sites et Monuments les Plus Interessants pour l'Etude de l'Art et de l'Histoire* (1858) are considerably more beautiful, sophisticated, and compelling than any image in DuCamp's *Egypte, Nubie, Palestine et Syrie*—but because Teynard's album is considerably rarer than DuCamp's, it was forgotten for decades and was overshadowed by it in the histories. The Americans Leavitt Hunt and Nathan Flint Baker became the first Americans to photograph in Egypt and Jerusalem during their Grand Tour of the Orient 1851/52. The trip resulted in about 60 negatives, which Hunt and Baker planned to print and market in the United States; the plan, however, collapsed, very few prints were ever made, and no more than a handful have ever appeared on the market. Hunt's and Baker's images are mostly pedestrian, but their rarity makes them among the most desirable Egyptian photographs. Whether Hunt and Baker encountered Teynard on the Nile is an interesting question. The year after, 1853–54, the French born and Parisian trained American John Beasly Greene, made the first of three trips to Egypt to photograph and excavate. Greene was the first trained egyptologist who was also a trained photographer, and his images include some of the most haunting made in Egypt. Greene intended to publish his work in album form, but the album never materialized even though prints had been commissioned from Blanquart-Evrard. Greene died shortly after returning to Egypt for the third time; he was 24. The Alsatian painter and amateur archaeolgist August Salzmann, spent several months in Jerusalem in 1854, photographing the architecture of Jerusalem; on a second trip, he photographed elsewhere in the Holy Land. Salzmann's *Jerusalem, vues et monuments de la ville sainte de l'époque judaïque au present* was published in 1856. Louis-Constantin-Henri-François-Xavier de Clerq, joined an exploratory mission to Syria in 1859 and used the opportunity to travel throughout the Mediterranean. *Voyage en Orient, 1859–60*, a six volume work containing 222 original prints made by Blanquart-Evrard that is highly prized today. Somewhat later, the American-born German Jacob August Lorent traveled extensively through the Middle East. Particularly interested in photographing buildings endangered by development, Lorent published two noteworthy books: *Egypten, Alhambra, Tlemsen, Algier, Photographische Skizzen* (1861) and *Jerusalem und seine Umgebung. Photograpische Sammlung* (1865). The Englishman Francis Frith is undeniably one of the pivotal figures on this period. Primarily an entrepreneur, Frith made three extended trips to Egypt, in 1856/57, 1857/58, and 1859/1860. He used three different cameras, the largest for plates 15 × 19 inches. *Egypt and Palelastine Photographed and Described by Francis Frith* (1858–60) was the first of seven collections of Middle Eastern photographs published by Frith by 1862. They established his reputation and enabled him to create a picture service that controlled over 4000 images. Other photograophers active in this period include the English amateur John Shaw Smith, who made over three hundred calotype negatives during a two year tour of the Orient, 1850–52, for his own private use. Théodule Dévéria, like his friend John Beasly Greene, was an archaeologist, and a prolific photographer, though much of his work has not survived; and Frédéric Auguste Bartholdi, better known as the sculptor of the Statue of Liberty, who made two extended trips up the Nile. Finally, there was James MacDonald, a sergeant in the Royal Engineers, who was associated with the Ordnance surveys of Jerusalem and the Sinai. These are among the dozens who were active as photographers during this period, most of them making photographs that were meant to appear in publications.

Anton Schranz, a Maltese, opened the first professional studio in Cairo that catered to the tourist and souvenir trade by April 1850, when Florence Nightingale—as she noted in the diary of her trip to Egypt 1849–50—bought souvenir prints from him to give to relatives. By the end of the decade, W. Hamerschmidt, a

professional photographer from Berlin, had established himself in Cairo, where he made excellent quality large format prints to sell to tourists. The opening of the Suez Canal and the introduction of package tours in 1869, created an enlarged market for pictures that could support a lerger, more competitive market. A proliferation of studios followed: Antonio Beato, Henri Bechard, G. Lékégian, J. Pascal Sebah, and the Zangaki Brothers in Cairo, along with Peter Bergheim and Mendel John Diness in Jerusalem. Photographs from these studios survive in great quantities—all generally similar in style and composition, a reflection of the size of the tourist trade, and of the enormous demand for photographs whether for personal souvenirs or for the arm-chair traveler.

By the end of the 1880 these studios were in decline. The introduction of the Kodak and other simple, easy to use cameras, along with the advent of practical and inexpensive photomechanical reproduction technologies, reduced the travelers dependence on outside sources of imagery. By the beginning of the new century, and certainly by the beginning of WW1 and perhaps a lessened obsession with the exotic and the ancient, the school of Middle Eastern photography that arose and flourished in the 19th century had lost its soul.

WILL STAPP

See also: Joly de Lotbinière, Pierre Gustave Gaspard; de Prangey, Joseph-Philibert Girault; Itier, Jules; Keith, Thomas; Bridges, George Wilson; Trémaux, Pierre; Du Camp, Maxime; Blanquart-Evrard, Louis-Désiré; Teynard, Félix; Baker, F.W.; Hunt, Robert; Greene, John Beasly; Salzmann, Auguste; Frith, Francis; Smith, John Shaw; Bartholdi, Frédéric-Auguste; Beato, Antonio; Sebah, Johannes Pascal and Joaillier; and Zangaki Brothers.

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EICKEMEYER JR., RUDOLF (1862–1932)

Rudolf Eickemeyer Jr. started taking photographs in 1884 while working at his father's engineering firm. In 1889, he joined the local camera club in Yonkers, New York, and began contributing articles on photographic chemistry, lighting, and technique to journals like the *Photographic Times*. He turned professional in 1896, operating a studio in New York City. Eickemeyer relied on commercial work for financial support while continuing to develop his skills as an art photographer. He gained critical acclaim in America and Europe for his pictorialist landscape and portrait photography; his images were often selected by Alfred Stieglitz to appear in the Photo-Secession journal *Camera Work*. But, his best known series of portraits is probably those of the young model Evelyn Nesbit commissioned by her lover, the famous New York architect Stanford White. Shortly before his death in 1932, Eickemeyer endowed a fund for the development of the Smithsonian Institution's Section of Photography and donated a large portion of his personal collection. The donation included important prints, albums, lantern slides, cameras, books, letters, articles, lectures, and awards documenting his long

career in photography. The remainder of his collection was donated to the Hudson River Museum in Yonkers, New York.

MICHELLE ANNE DELANEY

ELLIOTT, JOSEPH JOHN (1835–1903) & FRY, CLARENCE EDMUND (1840–1897)

Photographers

On 29 July 1862, professional photography in the United Kingdom was given a boost by the passing of the Fine Arts Copyright Act, which gave statutory copyright protection to photographs for the first time. If the photograph was made for or on behalf of someone for a 'good or a valuable consideration,' the person giving the consideration (such as the proprietor of a photographic studio, who paid his photographer) was the owner of the copyright.

Moreover, by asking a celebrity to pose for his or her portrait without payment a studio could obtain images that could be sold for a profit to a public filled with the craze for collecting *cartes de visite.* The studio portrait company of Elliott & Fry was founded in 1863 to take advantage of these developments, and subsequently became one of the most prestigious such firms in the country, taking photographs for and selling images of royalty and the aristocracy, political, military and naval leaders, and the stars of sport, music and the stage.

Joseph John Elliott was born in Croydon in 1835, the son of John Elliott and Mary his wife, the daughter of Thomas Brown. Clarence Edmund Fry was born in Plymouth in 1840, the son of Edmund Fry and Caroline Mary, nee Clarence. Clarence Fry had a sister, Lucy Elizabeth born in Plymouth in 1844, who in 1864 married Joseph Elliott in Brighton. How they had met is not known, but it is clear that the connection between the photographic partners was more than a purely professional one. The marriage was followed by the birth of six children, the third of whom, and the eldest son, was Ernest who later succeeded his father in the company when Joseph died in 1903 at his home in Hadley Green near Barnet. Clarence Fry lived in Watford; he died in 1897.

The photographic company was based throughout the later nineteenth century at 55 Baker Street, at premises known as the Talbotype Studios, using the name popularly given to William Henry Fox Talbot's calotype process. From perhaps as early as 1870 it also had a printing works in Barnet, near where the Elliotts lived at the time. This was responsible for production of silver and carbon based prints for clients and for commercial sale.

Sadly little is known about the company since its surviving records were destroyed by bombing during the Second World War. The most detailed information about it comes from an article in *The Photographic News* in January 1880, which described a visit to the Baker Street premises by H Baden Pritchard, who was shown around by Clarence Fry himself. There were three studios at this time, with east-facing window lights and top lights, one small and used mainly for vignettes, the others larger and equipped with a variety of painted backgrounds from which clients could choose. In each studio the camera

Elliott, Joseph John. Before the Ball.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

itself was shaded by an overhead canopy as a giant lens hood, and there were movable shades to all the windows as well as portable screens. The walls of reception rooms and dressing rooms were all covered by paintings and enlargements of photographic portraits 'to try to show what photography can do in vieing with painting in the production of large artistic portraits' . Sittings were relatively expensive by the standards of other establishments (although Pritchard thought the rate quite reasonable), at a guinea (£1 1s) a time, which includedeighteen cartes de visite or six cabinet-size prints. This price compared with a cost of about half a guinea for a seat in the stalls at a West End theatre. Many sitters, though, did not pay. Instead they sat so that the company could sell prints commercially, giving the sitters additional publicity and Elliott & Fry useful income. This was an important side of the business, not only through the sale of prints over the counter but also through their sale for use to illustrate books. Portraits of Wilkie Collins, Oscar Wilde, Joseph Chamberlain, Matthew Arnold and Charles Darwin were all published in books, as engravings or Woodburytypes. Commercial prints were also used to attract new celebrity clients, by sending them copies as samples of what could be achieved, though not all were convinced: the social reformer Samuel Smiles declined, saying that he preferred to own the copyright in any portraits so that he could control their use.

Sitters for Elliott & Fry included soldiers and statesmen, such as Lord Chelmsford, Gladstone, the Shah of Persia and Bismarck, religious figures including bishops and members of the Booth family, artists such as George Cruikshank, Walter Crane and William Morris, writers such as Mrs Humphrey Ward, Thomas Carlyle, Rudyard Kipling and Elizabeth Barrett Browning, musicians such as Clara Schumann and Edvard Grieg, actors such as Ellen Terry, sportsmen such as the Channel swimmer Matthew Webb, and members of the Royal Family from the Queen down. The photographers who actually took the pictures were relatively few in number, but one of them was Clarence Fry himself, who was still working as a photographer until shortly before his death. The most frequently employed during the nineteenth century was Francis Henry Hart of Fitzroy Square and St John's Wood but others were the Chevalier Luigi Beroieri of Chelsea until his return to Italy in 1896; John McLanachan of Hanwell and later Torquay; and Alfred James Philpott of Richmond and Twickenham.

The photographic style of the company throughout the period was simple, with few props (some of which remained in use for many years), and fewer backdrops despite their apparent prominence in the studios. By the end of the century lighting was effectively used to give definition and life to features and to provide impressive depth and detail in costumes and hair. Poses were almost always formal, even with actors in costume, but some individuals, such as J. M. Barrie and the poet Longfellow managed to appear more relaxed.

The company survived until 1963 when it was taken over by Bassano & Vandyck (now the Bassano Portrait Studios). Its surviving negatives and prints were deposited in the National Portrait Gallery, only a small proportion of which date from the nineteenth century. There are however many prints of nineteenth century portraits by the company at The National Archives.

TIM PADFIELD

See also: Calotype and Talbotype; Talbot, William Henry Fox; Pritchard, Henry Baden; Cartes-de-Visite; and Woodburytype, Woodburygravure.

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ELLIS, ALEXANDER JOHN (1814–1890)

Alexander John Ellis took some of the earliest daguerreotypes in Italy, but his photographic achievements have been overshadowed by his many other accomplishments: his major interests were in the areas of spelling, pronunciation, mathematics and musical acoustics. The daguerreotypes were never published and he did not develop his flirtation with photography. His intention was to produce accurate representations of familiar Italian views but he was perhaps as fascinated by the technical aspects as by any aesthetic considerations, as also seems to have been the case with his musical interests.

At the age of 26, while travelling on the continent, Ellis decided to undertake an ambitious publishing project entitled *Italy Daguerreotyped*, for which he took a large quantity of landscapes and architectural views in a number of Italian cities. His choice of subjects traded on associations with the Grand Tour and the Enlightenment concern with classical civilisation. Public interest had been stimulated by the opening of the continent to leisure travel after the Napoleonic wars, and the focus of the Ellis collection is on topographical views in the tradition of *vedute*, a repertoire of locations well-known from previous illustrations.

Pictures at this time were often imaginative interpretations. Painters such as Claude Lorrain (1600–1682) had established, and those such as Louis Ducros (1748–1810) had perpetuated, a style that exploited historical and literary associations of established sites,

but often sacrificing accuracy to an artistic configuration. Engravings of such scenes, which were produced in large quantities and of variable quality, were equally unconcerned with an adherence to literal truth. Daguerre's 1839 *History and Practice of Photogenic Drawing* had claimed that his process was indispensable for the traveller and antiquary, as it offered the possibility of topographical precision. Ellis's reference to these categories of potential user in his proposal outlining the book's contents suggests that he was familiar with Daguerre's book. Ellis stressed that his concern was faithfulness of detail, to ensure that future visitors would not have their expectations aroused by prints, only to be disappointed by the reality.

Despite his amateur status, Ellis undertook the project with professional commitment and a great deal of energy. As well as Rome, he visited Pompeii, Pozzuoli, Paestum, Naples, Pisa, Florence and Venice, most of them several times, between April and July 1841. During this period he took 137 daguerreotypes. With little experience upon which to draw, he proceeded by trial and error. He brought to the task the systematic approach that he utilised in his later scientific activities, analysing such variables as climate, chemistry and time of day in order to refine his technique.

The value of the collection is enhanced by the notes that he took. For each daguerreotype, Ellis recorded the date, place, view, the time exposure began and ended, atmospheric conditions, his rating of how successful the exposure had been, and general observations. All were taken using Daguerre's original process and Ellis probably corrected lateral reversal by using a mirror in front of his lens, both factors accounting for the length of exposures, the recorded one of which ranged from 6 to 73 minutes.

In addition to his own daguerreotypes, Ellis purchased a number from Achille Morelli and Lorenzo Suscipj (1802–1855). The latter took nine of the daguerreotypes in the collection in 1840, thus predating Ellis's. Both Morelli and Suscipj were responsible for miscellaneous views, but notably each took a panorama of Rome, Morelli taking thirteen from the Capitol Tower (forming a complete circle) and Suscipj eight from San Pietro in Montorio. Each of these sequences was made in June 1841, suggesting that the pair were commissioned by Ellis. However, the fact that Suscipj produced daguerreotypes before Ellis indicates that he played a more significant role than suggested by Gernsheim (1982) who stated that Suscipj and Morelli "assisted" Ellis, and indeed by Ellis himself, who referred to his unnamed "aides."

Ellis's proposal for *Italy Daguerreotyped* describes it as "a collection of Views, chiefly architectural, engraved after Daguerreotypes in the possession of the Editor" (i.e., himself). It was intended to comprise 60 engravings faithfully copying the originals. Thirty-two pictures were to be of Rome, alternating with those of other cities, each accompanied by a short description specifying the point from which it had been taken, the date, and the name of every public building shown. Ellis chose large 150mm × 205mm plates because they needed to be able to contain the requisite detail that would allow the engraver to transcribe them accurately. The work was to be published in twenty monthly parts at a price of 1/- or 1/6 each number, commencing 1 January 1845, but the project was abandoned and Ellis put the plates aside.

There are a number of possible reasons why the book was not produced. Gernsheim claims that it was because of the expense of engraving the pictures. In addition, *Excursions Daguerriennes*, comprising engravings based on daguerreotypes taken in Europe and the Near East, was published in Paris between 1841 and 1844 by Noël-Marie Paymal Lerebours (1807–73), and Ellis may have decided that the sense of novelty had been lost. More importantly, *Excursions Daguerriennes*' engravings did not do justice to the originals, and Ellis perhaps felt that the same fate would befall his project. Finally, he may have not had time to see *Italy Daguerreotyped* to fruition because during this period he was immersed in his philological researches, publishing *Phonetics* in 1844 and *The Alphabet of Nature* the following year.

Instead, the 159 whole-plate daguerreotypes, along with the accompanying documentation, were given to the Science Museum by Ellis's son Tristram upon his father's death in 1890 and subsequently transferred to the National Museum of Photography, Film and Television in Bradford (which reproduces many of them on its website). Becchetti and Pietrangeli's *Roma in Dagherrotipia* (1979) prints all of the Roman views. Together, images and notes form a significant collection from this period, providing both a documentary record of facets of those cities, and insights into the technical aspects of recording them with an infant medium.

TOM RUFFLES

Biography

Alexander Ellis was born in Hoxton, Middlesex, on 14 June 1814. His name was originally Sharpe, but he changed it to his mother's maiden name in 1825. This was a condition imposed by a relative of his mother for Alexander to receive significant financial support, giving him lifelong security. He was educated at Shrewsbury, Eton and Trinity College, Cambridge. He married in Naples in 1840 and after periods in a number of places, including Dorking, Bath and Bristol, he and his family settled in Kensington, west London. Author of many works on spelling, pronunciation, acoustics and mathematics, he corresponded widely and was associated

with numerous learned societies, notably being a fellow of the Royal Society, the Society of Antiquaries and College of Preceptors. He was awarded an honorary doctorate by Cambridge University four months before his death, which occurred on 28 October 1890. None of his obituaries mentions his daguerreotypes.

See also: Daguerre, Louis-Jacques-Mandé; and Lemercier, Lerebours & Bareswill.

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ELLIS, WILLIAM (1794–1872)
English missionary, botanist, and photographer

The Reverend William Ellis originally embarked on a career as a gardener before his ordination at the age of twenty-one. He became a missionary, in Africa and in the South Pacific, eventually becoming the Chief Foreign Secretary of the London Missionary Society.

By the late 1820s he was publishing accounts of his missionary activities and travels—notably in 1826 a book on his experiences in Hawaii—but he was in his late fifties before his first encounter with photography, learning the skills of the art in preparation for a series of journeys to Madagascar between 1853 and 1856—ac-

Ellis, Reverend William. Portrait of Black Couple.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

companying another missionary photographer, James Cameron. His account of his travels and photography was published in *Harper's Monthly* in April 1859.

Believing that visual material would support his missionary activities even more than the printed word, his camera became a powerful tool, and in his accounts of his travels, he recorded the reaction of the natives to seeing their own likenesses for the first time. He was taught photography by Roger Fenton.

Ellis was also a botanist, and is credited with the discovery of a number of species of orchids in eastern Madagascar during further journeys to the islands in the late 1860s.

His images survive in a number of major collections in the US and Britain.

JOHN HANNAVY

EMERSON, PETER HENRY (1856–1936)

English photographer and writer

Peter Henry Emerson was born in Cuba on 3 May 1856. His American father, Henry Ezekiel Emerson, distantly related to the author Ralph Waldo Emerson, owned a sugar plantation on the island, but due to his poor health, the family moved in 1864 to Wilmington, Delaware. Three years later, however, Emerson's father died and after a short stay in Cuba the young boy's mother took the family back to Wilmington where he began his formal education. In 1869 the family again moved, this time to England, where Emerson spent the rest of his life, taking the option of British nationality that was open to him via his English grandfather. His academic progress was impressive both at school and subsequently at university in London and Cambridge. He studied medicine, gaining his MRCS in 1879 and his MB in 1885. Despite being considered one of the best medical students of his generation, Emerson, who was fortunate in having a private income, decided not to practise medicine and devoted himself instead to a variety of interests. In 1881 he purchased his first camera and it is for his photographs and for his writing that he is now best remembered. All of his published photographic work, with minor exceptions, appeared between 1886 and 1895. He continued to write, however, on his family history and on a variety of other subjects, to the end of his life.

Emerson was married in June 1881, to Edith Amy Ainsworth, a nurse whom he had met during his medical studies. At the end of that year, the couple took a holiday in Italy. It seems to have been here that Emerson began to develop his strongly-held views on art and nature. In August 1883 he took a holiday in the coastal town of Southwold in Suffolk, in the part of England that was to become the inspiration and location for most of his subsequent work. Also in that year he joined the Photographic Society Club, London. Two years later, in 1885, Emerson returned to Southwold and, together with his brother, hired a yacht for a cruise on the Norfolk Broads. On this cruise he met the painter Thomas Frederick Goodall (1857–1944). Goodall, a Norfolk man, had trained at the Royal Academy of Arts in London and was an exponent of the French-influenced 'Naturalistic' style of painting with which Emerson had strong sympathies. Emerson and Goodall became firm friends and artistic collaborators and for the following six years Emerson's photographic activities were concentrated mainly in rural Norfolk.

In 1886 Emerson, with Goodall as co-author, produced *Life and Landscape on the Norfolk Broads*, a large book of forty platinum prints, with a text describing aspects of life in and around the inland waterways of Norfolk. Two more books followed in 1887; *Pictures from Life in Field and Fen*, and *Idyls of the Norfolk Broads*. These were illustrated with photogravures made, Emerson stated, directly from his negatives. The platinum prints of *Life and Landscape on the Norfolk Broads* had been made in Scotland by Valentine and Sons, of Dundee. These prints were of variable quality and it was possibly this experience that contributed to Emerson's choice of photogravure for all his subsequent publications, although the close relationship between the methods and materials of photogravure and of the artistic medium of etching was probably a more influential factor.

In the introduction to *Pictures from Life in Field and Fen*, Emerson claims, of the photogravure: "If successfully performed, it is purely an automatic process, so that the resulting copper plate is a facsimile of the negative, no translator stepping in to mar the work." It is clear, however, that considerable retouching has been carried out on these images, which was the normal practice of reproductive printmakers at this time. Emerson, while deploring this practice, had little control over it. In the same introduction he states: "The plates are, as a rule, entirely free from retouching, and any hand-work that has been introduced is a cause of regret to us, and we are in no way responsible for it, for our idea of a perfect photo-etching or engraving process is one in which the resulting copper plate is entirely the effect of chemical action."

In 1888 followed *Pictures of East Anglian Life*, illustrated with thirty-two photogravures and fifteen small half-tones in Collotype. Then in 1889 came the book that was described by one of Emerson's contemporaries as having the effect of "a bombshell dropped into the midst of a tea-party." Emerson's first edition of *Naturalistic Photography for Students of the Art* set out, in uncompromising fashion, his views on art and on photography, on the characteristics of the eye, on contemporary artistic practice, and the consequent

implications of these for a photography founded on Naturalistic principles. Detailed instructions were given on every aspect of photographic practice. A second, slightly revised edition followed in 1890.

In *Naturalistic Photography* Emerson was addressing those who wished to emulate him. He was also aiming to align photographic practice with contemporary movements in British art with which he identified. This brought him into direct conflict with the photographic establishment, personified by Henry Peach Robinson (1830–1901), whose composite, sharply defined photographs were the epitome of all that Emerson despised, and whose book *Pictorial Effect in Photography*, published in 1869, had been a major influence on those whose photography had artistic pretentions.

Naturalistic Photography, in which Emerson prescribes methods, materials and techniques to be used by the student who wishes to follow his lead, would appear to describe, by implication, Emerson's own working practice. A study of his published work, however, reveals this to be only partially true. He advised, for instance, the use of long-focus lenses, to avoid the 'false drawing' given by lenses with a wide angle of view, yet many of his photographs show just this effect. He also frequently ignored his own rules on Naturalistic Focusing.

Emerson's theories of Naturalistic Focusing caused controversy and confusion. Quoting the work of the German scientist and medical researcher Hermann von Helmholtz, Emerson advocated the use in photographs of a restricted depth of field as analogous to that of the eye, and, reasoning that photographic lenses were capable of greater definition than the eye, advised that "... it is always necessary to throw the principal object slightly (often only just perceptibly) out of focus, to obtain a natural appearance...." This, of course, simply shifts the focal plane elsewhere and Emerson's contemporaries, even if sympathising with his aims, were well aware of the practical difficulties of achieving them. In many of Emerson's published photographs, an area of sharp focus may be found that, given his antipathy to retouching, he was unable to disguise. In 1889 he asked his friend T.R. Dallmeyer to design a lens "like the eye," but Emerson found that it did not produce the effects he required. Other photographers, notably George Davison, while initially in favour of Emerson's principles, subsequently adopted the more diffused images of Impressionistic Photography, of which Emerson disapproved, causing some acrimonious exchanges in the photographic journals.

In 1890 Emerson published a folio entitled *Pictures of East Anglian Life*, comprising a selection of ten prints from his book of the same name. It was intended as a supplement to *Naturalistic Photography*, to show in pictorial form the results that the student should aim for. Also in 1890 appeared *Wild Life on a Tidal Water*.

During the second half of 1890 Emerson was approaching a crisis in his artistic life. He had begun to have some doubts about the artistic status of photography and his correspondence with painters, notably George Clausen, had not been encouraging. Clausen pointed out to Emerson the limitations of photography as an artistic medium; limitations of which Emerson had previously been dismissive.

In May 1890 Hurter and Driffield had published the results of their photo-chemical investigations into the characteristics of dry plates. An important conclusion was that once the plate had been exposed, the ratios of the of the image densities were fixed and could not be altered during development. Until then, photographers believed that tonal relationships could be altered by selective development, and indeed this subjective intervention was fundamental to Emerson's claims for the artistic status of photography. He spent three months during 1890 testing, in practice, Hurter and Driffield's laboratory results and reluctantly concluded that they were right.

Emerson's justification of the status of photography as an artistic medium relied on the ability of the photographer to select and frame a subject; to adjust the focus and the focal plane to emphasise some parts of the subject and suppress others; and, most importantly, to adjust the tonal relationships on the negative to match those as visualised by the photographer. He wanted the freedom of the artist's subjective transcription of tones, even if this was at variance with their relative luminance. Science, however, denied him this freedom. In Emerson's words: "I thought once (Hurter and Driffield have taught me differently) that true values could be obtained and that values could be *altered at will* by *development*. They cannot; therefore, to talk of getting the values in any subject whatever as you wish, and of getting them true to nature, is to talk nonsense" (Emerson's italics).

Emerson came to the conclusion that photography was not and could not be art and in consequence he published, at the end of 1890, a pamphlet entitled *The Death of Naturalistic Photography* in which he gave his reasons for this renunciation, as he called it: "... misgivings seized me after conversations with a great artist, after the Paris exhibition; these were strengthened after the appearance of certain recent researches in psychology, and Hurter and Driffield's papers; and finally the exhibition of Hokusai's work and a study of the National Gallery pictures after three-and-a-half months' solitary study of Nature in my house-boat did for me."

Emerson's 'great artist' has not been identified. Both Whistler and Clausen have been suggested, but on the available evidence it seems unlikely that Emerson would have had the opportunity of "conversations" with Whistler.

The reactions to this renunciation were polarised

Emerson, Peter Henry. Rowing Home the Shoof-Stuff.
The Metropolitan Museum of Art, Gilman Collection, Purchase, Mrs. Walter Annenberg and the Annenberg Foundation Gift, 2005 (2005.100.726) Image © The Metropolitan Museum of Art.

between the dismay of those who had followed his teaching and the delight of those whom he had antagonised. Emerson recalled unsold copies of the second edition of *Naturalistic Photography* and wrote to his friend, the sculptor James Havard Thomas that he was considering giving up photography entirely. "I wish to God I had never seen a camera..."

But Emerson was resilient and his correspondence in the spring of 1891 with Joseph Pennell, the American artist and illustrator, shows him arguing vigorously that photographic images, printed as photogravures, could legitimately be considered as art. Pennell politely disagreed.

Emerson did not give up photography and continued to publish his work. In 1893 he published *On English Lagoons*, and in 1895 *Marsh Leaves*. He made the photogravure plates himself for these, his last two illustrated books. As opposed to his earlier large-format photographs, frequently showing rural scenes and agricultural workers, his post-renunciation photographs are smaller, contain progressively fewer human figures, tend to concentrate on distant subjects and, frequently, the effects of the mists and frosts of autumn and winter on the landscapes of rural Norfolk.

Emerson's last attempt to influence his contemporaries was his publication, in 1899, of the third edition of *Naturalistic Photography,* from which all references to the artistic status of photography were excised. Despite his earlier public renunciation of photography-as-art, he retained his conviction that photographs should share the materials and methods of the artist-printmaker. He wrote:

> ... we feel that the day is not far distant when every one who expresses himself by photography will also bite his own plates and make his own blocks, and the prints will be published by print-dealers as etchings are now. This, in my opinion, is the only method which can give fullest satisfaction.

It is clear from Emerson's correspondence with Alfred Stieglitz that he continued to take photographs into the 1920s, but no evidence of this output seems to have survived. Apart from the published work, many examples of which still survive, thanks to their publication in bound volumes, there exists a number of unpublished photographs by Emerson that were donated to George Eastman House, where they remain as the only significant collection of his unpublished work in a public collection.

P.H. Emerson died in 1936, one day short of his eightieth birthday.

David Stone

Biography

Peter Henry Emerson was born in Cuba on 3 May 1856, to an American father and an English mother. Following the death of his father in1867, his mother moved the family to England, where he completed his education, qualifying in medicine in 1885, having married in 1881. There were five children, born between 1882 and 1892.

His photographic subjects were concentrated mainly in the English county of Norfolk and published in a series of books and folios combining text and photographs, some co-authored with the painter T.F. Goodall.

Emerson exhibited his photographs from 1882 onwards.

His main publications are:

1. *Life and Landscape on the Norfolk Broads* (1886) with T. F. Goodall
2. *Pictures from Life in Field and Fen* (1887)
3. *Idyls of the Norfolk Broads* (1887)
4. *Pictures of East Anglian Life* (1888)
5. *Naturalistic Photography for Students of the Art* (1889/1890/1899)
6. *Pictures of East Anglian Life* (1890)
7. A portfolio of 10 prints selected from the book of the same title *Wild Life on a Tidal Water* (1890)
8. *The Death of Naturalistic Photography* (1890)
9. *On English Lagoons* (1893)
10. *Marsh Leaves* (1895)

See also: Photographic Exchange Club and Photographic Society Club, London; Platinum Print; Photogravure; Robinson, Henry Peach; Helmholtz, Hermann Ludwig Ferdinand von; Dallmeyer, John Henry & Thomas Ross; Davison, George; Impressionistic Photography; Hurter, Ferdinand, and Driffield, Vero Charles; and Stieglitz, Alfred.

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EMPEROR PEDRO II (1825–1891)

Pedro de Alcântara João Carlos Leopoldo Salvador Bibiano Francisco Xavier de Paula Leocádio Miguel Gabriel Rafael Gonzaga de Bourbon Habsburgo e Bragança was born in Rio de Janeiro on December 2, 1825. His father, Emperor Pedro I, abdicated in 1831. Pedro II purchased a daguerreotype camera in 1840, the year he was declared an adult and enthroned. He also learned to use it, thereby becoming the first Brazilian-born photographer. As a patron, he encouraged the development of photographic methods, spent vast sums on photographs and albums, and in 1851 created the post of Imperial Photographer, an appointment held by Buvelot & Prat (1851), Insley Pacheco (1855), Christiano Junior (1857), Klumb (1861), Stahl & Wahnschaffe (1862), Lopes Cardoso (1864), Ferreira Guimarães (1866) and Gutierrez de Padilla (1889). Pedro II traveled extensively and collected European photographs, while ensuring that Brazilian photography featured prominently in his country's pavilions at Universal Exhibitions in London (1862), Vienna (1867), Philadelphia (1876) and Paris (1889). Deposed and banished in 1889, he died as Pedro de Alcântara in Paris on December 5, 1891. His collections, including albums by Benjamin Mulock and Victor Frond, are housed at the National Library in Rio and the Imperial Museum in Petrópolis, Brazil.

SABRINA GLEDHILL

EMULSIONS

Strictly speaking these are "Suspensions" but the name has stuck. A true emulsion is a stable mixture of two incompatible liquids, salad cream then a familiar example of oil and vinegar. The original weird and wonderful concoctions also used egg albumen as a stabiliser and had a similar appearance and texture. In the course of time it has changed to mean both the liquid and the dried material on a negative or paper print.

Today we tend to think only of gelatin emulsions although in the 19th century it was used for fewer years than albumen or collodion.

The word was unknown at first, the sensitive matter being deposited in paper rather than onto it, Talbot's original process of dipping then drying. This was used for both the negative and positive and it was not until Niépce de St. Victor invented the albumen process in 1848 any real improvement was possible. There were two crucial inventions here. The first was a rigid base, a glass plate. The real breakthrough was the prior preparation of a light sensitive mixture applied to the plate, then dried, the emulsion. This invention has remained essentially unchanged.

Niépce opened up the way for major improvements in associated camera and lens technology because huge negatives needed them. A positive could only be made by contact printing and the glass plate solved the other inherent problem with paper, its opacity. Once the concept of applying an emulsion as a transparent sensitised layer to a transparent inert base had been established, photography as we know it started. Fuzzy images and long exposures gave way to a faster and sharper process.

However, it's important to understand that whilst every worker, then Company, has their own 'secret' emulsion recipe, the basic principles haven't changed since 1848. A mixture of silver halides is made or mixed in a solution of a transparent substance which when applied to the plate, dries to a stable light sensitive coating. Precise details of selecting, preparing, mixing, and spreading seem like witchcraft today, but remain familiar in any modern factory using gelatin. This is then exposed, developed and used to make any number of prints.

With this key bit of technology established it soon became apparent that an emulsion applied to paper also greatly simplified print making. A prior albumen application made the paper both more rigid but also kept the sensitive emulsion where it was most needed, on the surface. The albumen in the emulsion also added a sheen to the final image and acted as a protecting or "anti-scuff" surface.

In the same year 1848 that Niépce introduced albumen, R. J. Bingham of the Royal Institution, London, gets the credit for first suggesting gun cotton or collodion for photography. As a synthetic material it had many obvious advantages. Scott Archer prepared his first negatives that year, then disclosed his collodion process in 1851. By 1855 collodion had largely displaced albumen when Mayall published the then most widely used albumen system. The two systems ran in parallel for a long time and albumen continued for decades after collodion had been replaced in turn by gelatin.

Albumen had a number of practical disadvantages, not least bacterial spoilage and uncertain quality but when dry it also stood up to abuse much better than the other obvious natural alternative, gelatin. It was not for another 30 years that this problem was solved and even then albumen prints remained a firm favourite right up to recently, and for large glass lantern slides at the turn of the century nothing today really excels for tonal quality.

Like albumen, collodion emulsions found very wide application in both negative and positives. Its main practical advantage was the ability to prepare and store stock solutions without decomposition. Even after a century and a half some samples from the period are still usable and the technology might not have moved on much were it not for a severe disadvantage of collodion, its unsuitability for scientific measurements. When dried, the emulsion became very insensitive, and nearly all negatives were created from the "wet collodion" process. For precise work needed for the Transit of Venus in 1874 the wet process was totally inadequate.

The Royal Greenwich Observatory gave W. de W. Abney the task of solving this and he modified and combined both the emulsions of the time. He used the stability of dried collodion as a base and albumen as a sensitive layer. He cured the decomposition problem with an unlikely ingredient, stale beer. This beer albumen process paved the way for all modern photography because it illustrated two fundamental clues to progress. The first was that prior chemical treatments of dry plates could yield huge increases in sensitivity and gave long-term storage as a bonus. Second, it was possible to modify the colour sensitivity of the emulsion. Abney's two critical discoveries led to everything we know today, high speed panchromatic, then colour films.

Once this groundwork had been established the time was ripe for another major step forward in emulsion technology, better alternatives to inflammable collodion and decomposing egg white. Gelatin had been tried since Talbot's invention but the stuff was simply not well enough defined to be reliable. With Abney's initiative, better gelatin consistency was sought and quickly found to be vastly superior. By the 1880s gelatine had become the major ingredient in emulsions but even as late as 1896 R Child Bayley still hadn't fully solved the specification problem in a paper to the Royal Photographic Society. Gelatin emulsions had become the standard photographic medium for the next Venus transit in 1882, and Abney's special additives had increased sensitivity way beyond anything thought possible a decade before.

Emulsion technology hasn't changed much from that time because of a peculiarity of gelatin, it contains natural components which actually sensitise the emulsion. No synthetic substitute comes anywhere near that unique property. Making an emulsion falls into several stages, laid down in the 1880s.

Gelatin has to be critically quality controlled for consistency, then mixed with water to make the basic ingredient. To this is added, or it is added to a solution of halides. The ratio of bromide to chloride and iodide, determines the photographic properties and the gelatine controls the grain size when silver nitrate is added to the mixture. Then follows a period known as "ripening," still a very much mysterious situation when the emulsion reaches an improved sensitivity. When that process is over, the emulsion is coated onto the negative or positive and allowed to dry. At all stages before use many special ingredients can be added to confer special properties, and there may be washings to remove some or all of these. That is one reason why no two batches of photographic emulsion behave exactly the same.

The only major change towards the end of the century was to flexible film instead of glass plates introduced by George Eastman. That led ultimately to an emulsion expansion into the present mass market through ever smaller formats and convenience in use.

MICHAEL MAUNDER

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ENGLAND, WILLIAM (1816–1896)

British photographer and inventor

William England is arguably one of the forgotten giants of 19th century British photography and, regretfully, his work is largely ignored today. Born in London in 1816 England began his photographic career in the early 1840s as a daguerreotypist, going on to use both the wet and dry collodion processes and printing with albumen. After building a reputation as both a gifted technician and portrait photographer of some talent, he eventually abandoned portraiture to join The London Stereoscopic Company, upon its founding in 1854. England soon became the company's principle photographer and leading technical innovator. England was largely responsible for building London Stereoscopic Company's global reputation over the next decade and his travels took in a wide variety of foreign destinations such as Ireland (1858), the U.S. and Canada (1859) and Paris (1860 and 1861). It was primarily these 'exotic' views that captured the imagination of the public and contributed greatly to the rapid rise of London Stereoscopic Company in the 1850s and 60s when stereography was at the height of its popularity. Originally founded by George Swan Nottage, London Stereoscopic Company produced a wide variety of stereoscopic views that were all the rage during the Victorian era and London Stereoscopic Company were one of the very first companies to license their imagery for commercial reproduction on a global basis. Staff photographers such as Reinhold Thiele and William England traveled the world in their mobile, horse-pulled darkrooms shooting a variety of subjects and views for commercial reproduction by London Stereoscopic Company. Aside from his outdoor work England produced a variety of subject matter including formal portraiture and London Stereoscopic Company's renowned 'Comic' series which included the hugely popular 'ghost' stereographs, employing double exposure techniques. England left London Stereoscopic Company at the height of their popularity in 1863 to concentrate on a freelance career though his last major project on behalf of London Stereoscopic Company was as the exclusive photographer for the International Exhibition od 1862 in London. England's collection of some 15,000 stereoscopic plates have survived relatively intact over the years and was once 'saved' from being turned into greenhouse glass shortly after London Stereoscopic Company ceased trading in the early 1920s.

The invention of 3-D photography (stereography) first received popular acclaim at the Great Exhibition of 1851 in London and within 10 years stereographs had entered almost every home in Europe and America as a new form of entertainment. England's most important series for London Stereoscopic Company were taken during his American journey in 1859. He traveled from New York, up the Hudson river and through the Catskill's to Niagara into Canada, capturing over 230 views along the way, as well as other locations including Philadelphia and Washington D.C. where he shot the Capitol under construction. His focus was on both urban and engineering works including the railroads as well as the dramatic scenery of the rivers and waterfalls and this series the first American views to be commercially available in Europe. His memorable shot of Blondin crossing Niagara Falls on tightrope became one of the best selling stereographs of all time—allegedly selling some 100,000 copies worldwide. The majority of England's stereo views were taken on a single short focus lens 'pocket' stereoscopic camera which was introduced by London Stereoscopic Company in 1858. The entire apparatus was a mere 20cm long × 12 cm wide × 5cm deep and, weighing in at just over half a kilogramme, meant it was eminently mobile and suited England's travels perfectly. The only problem with this type of single lens design was the fact the whole camera needed to be laterally moved along a groove or track, after the first image had been taken on one half of the plate. Though the camera movement could be varied up to a distance of 33cm, scientists of the day advised this not to be any more than the distance between the pupils of the eyes—about 6cm—for the proper stereo effect to be achieved. The single lens camera was soon superseded by the development of the 'binocular' or twin lens camera which took both images simultaneously which significantly accelerated the picture taking process.

As well as being a fine photographer with an instinct for style and composition, England was also a great technician and a number of London Stereoscopic Company's developments in photographic apparatus—particularly those connected with stereography—were largely due to England's technical expertise, for example he developed a shutter with variable openings in 1861. After leaving London Stereoscopic Company in 1863 to pursue a freelance career, England continued with his stereo work, capturing views all over Europe; France, Switzerland and Italy in particular. The many Alpine views taken by England were considered to be some of his finest and were very much his forte, those taken of the Chamonix Glacier being particularly sought after and the resulting stereographs sold all over the continent as well as in Britain. In 1867 England erected a photographic

printing studio at his home in Notting Hill, London ostensibly to print from his landscape negatives but continued to travel throughout Europe, and at his peak, England was regarded as one of the leading landscape photographers in Europe. However this did not help him during the Franco-Prussian War of 1870, when he was arrested in the Rhine region of Germany and accused of being a French spy. England was eventually released but not before the authorities had initially confiscated his lenses, though these were later returned. England is perhaps one of an elite band of photographers who spanned the whole evolution of photography from the daguerreotype to the roll-film and seemingly adapted to each phase with relative ease. Throughout his career his advice and patronage was much sought after and he was a member of several photographic societies. England died in August 1896, at the age of 80 and is arguably *the* greatest of a number of unsung British photographers of the Victorian era whose work is often overlooked.

A great proportion of England's work—the views taken on behalf of London Stereoscopic Company—are currently in private hands and housed in west London. Together with the stereoscopic negative plates, the collection also includes the original day books, contact prints and catalogues. Taken as a whole, the collection constitutes an invaluable photographic document of the period—not only for their historical significance but also for their image clarity, striking detail and technical brilliance. A unique view of the Victorian era…and all in glorious stereo.

MATTHEW BUTSON

Biography

William England was born around 1816 in London, England. Ran a daguerreotype portrait studio from 1840. Abandoned portraiture in 1854 and joined London Stereoscopic Company. First overseas trip on behalf of London Stereoscopic Company to Ireland in 1858. In 1859 traveled to USA and Canada producing the *America* series. In 1860 (approx) joined London Photographic Society. In 1861 visited Paris and in same year invented camera with variable shutter openings. Photographed International Exhibition of 1862 in London and the Dublin Exhibition of 1863 last major commissions for London Stereoscopic Company. 1863 onwards focused on freelance career producing his first views of Switzerland. Between 1863 and 65 took views all over Europe, though chiefly in France, Italy and Switzerland—specialising in Alpine views—with patronage and financial support of British Alpine Club. In 1865 published first major album containing seventy-seven panoramic views of Switzerland, Savoy and Italy. Erected a printing studio in Notting Hill, London in 1866. In 1867 published second album—seventy-two views of the Rhine. In 1871, England made a member of the London Photographic Society and in 1886 became President of the Photographic Society of Great Britain. In 1889 was one of the judges at the Universal Exhibition and later became vice-president of the jury. Later the same year he became chairman of the West London Photographic Society. In 1890 he ran the Solar Club of Great Britain. Died in London on 13th August 1896.

Exhibitions

1865 Dublin International Exhibition, Ireland.
Eleventh Annual Exhibition of the Photographic Society of London.
1867 Royal Cornwall Polytechnic Exhibition—Photographic Dept., Cornwall, England.
Paris Universal Exposition, Palace of the Champs de Mars, Paris, France.
Thirteenth Annual Exhibition of ther Photographic Society of Great Britain, London.
1868 Fourteenth Annual Exhibition of the Photographic Society of Great Britain, London.
1870 Neuvieme Exposition de la Societe Francias de Photographie com Palais de I'Industrie Aguado, Paris, France.
1872 Seventeenth Annual Exhibition of the Photographic Society of Great Britain, London.
1873 Eighteenth Annual Exhibition of the Photographic Society of Great Britain, London.
1874 Dixieme Exposition de la Societe Francias de Photographie com Palais de I'Industrie Aguado, Paris, France.
1875 Nineteenth Annual Exhibition of the Photographic Society of Great Britain, London.
1876 Centennial Exposition, New York, USA.
1877 Twenty-second Annual Exhibition of the Photographic Society of Great Britain, London.
1878 Twenty-third Annual Exhibition of the Photographic Society of Great Britain, London.
Exposition Universelle, Paris, France.
1881 Photographic Society of Great Britain Exhibition, London.
1883 Photographic Society of Great Britain Exhibition, London.
Exposition Internationale de Photographie, Palais des Beaux-Arts, Paris France.
1884 Photographic Society of Great Britain Exhibition, London.
1888 Royal Photographic Society Exhibition, London.
1890 Royal Photographic Society Exhibition, London.
1892 Photographic Society of Great Britain Exhibition, London.
1893 Thirty-eighth Annual Exhibition of the Royal

Photographic Society, London.
1895 Exhibition of Photographs, Process Work and "Black and White," City Art Gallery, London.
Third Annual Photographic Salon—The Linked Ring, Dudley Gallery, England.
Fortieth Annual Exhibition of the Royal Photographic Society, London.
Special Exposition of Photography Arts and Sciences, Imperial Institute, London.

See also: London Stereoscopic Company; Wet Collodion Negative; Wet Collodion Positive Processes; and Albumen Print.

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ENLARGING AND REDUCING

In photography's first decade, the practice of enlarging or reducing a negative image was largely unknown, although several pioneers had suggested the idea, and even practised it. John Draper had proposed making enlarged copies of daguerreotypes as early as 1840, and Alexander S Wolcott patented an enlarging camera in March 1843. In June of the same year, Henry Fox Talbot patented a calotype enlarger, and therefore has priority claim to the invention of a system for making an enlarged print from a negative. None of these early devices achieved widespread popularity, due in the main to the length of exposure necessary.

By the end of the century, however, such procedures were a commonplace part of the photographic process, with 'enlarging lanterns'—enlargers—available powered by gas, petroleum, limelight, magnesium and even electricity. The half-century in between was a period of invention and innovation, during which a range of instruments were patented and marketed.

Intriguingly, the practice of reducing image size evolved more rapidly than that of enlarging. The pioneer in this respect was John Benjamin Dancer of Manchester, England who, in May 1853 produced a micro-photograph, 2mm in diameter, of a memorial tablet to William Sturgeon, a pioneer in the science of electricity, from a 5" × 4" (125mm × 100mm) negative he had taken the month before.

It is interesting to note that Thomas Sutton, on seeing his first micro-photographs, commented that they were "of little or no practical utility" and "somewhat childish and trivial." Their uses proved to be anything but childish and trivial, and micro-photographs, produced by René Prudent Patrice Dagron (1819–1900) proved an effective means of getting messages out by pigeon post during the siege of Paris 1870–71. Dagron's technique involved reducing messages to microdots of just over 1mm diameter, a reduction of up to 100 times.

The micro-photograph also found a perhaps trivial but nonetheless engaging application in the "Stanhope," the invention of the same Rene Dagron who, in 1859. combined a tiny lens—invented in the late 18th century by Charles, the 3rd Earl of Stanhope—with a micro-photograph to form a single miniature magnifying unit which he called his "cylindre photomicroscopique."

Reduction frequently involved the use of a camera. During the carte-de-visite era, photographers such as Francis Bedford produced large photo-montages of captioned scenic views which were then copied on to small negatives and contact printed and mounted for sale as cartes-de-visite.

At the other end of the scale, initial approaches to enlarging in the early days of photography rarely involved negatives—enlarging daguerreotypes could be effected by using a copy camera—a sliding box camera designed to permit photography at a scale greater than 1:1.

With the introduction of the collodion negative in the 1850s, and increased availability of smaller format cameras, Achille Quinet invented a vertical enlarging camera in 1852, but it was an inefficient light-gatherer, and required very long exposures. In an attempt to resolve that problem, David Acheson Woodward designed and patented the idea of the solar enlarging camera in 1857, able to make enlarged life size prints from quarter plate and half plate negatives with an exposure of about forty five minutes. The camera used a mirror and condenser lens to focus sunlight on to the negative, the image being projected on to the paper via a copy lens. Patented improvements to the solar enlarger, in the 1860s and 1870s saw it equipped with a heliostat—a clockwork motor to rotate the mirror—thus ensuring that the light beam remained concentrated on the condenser lens throughout the exposure.

A modification of Woodward's design was introduced in 1864 by Desiré Charles Emanuel van Monckhoven. It was the first instrument to really look like an enlarger. Fitted into the wall of the darkroom, it gathered light in the same way as Woodward's apparatus, but used a more complex lens assembly to correct for spherical aberration and thus produce a sharper more evenly illuminated print.

J.F. Campbell's 1865 enlarger was the first vertical design, built into the studio roof and gathering daylight from above. The vertical enlarger, illuminated by artifical light, would not become commonplace until the 1890s.

Alphonse Liébert's enlarging apparatus was introduced at about the same time, and was used by fellow photographer Nadar to create his first enlargements that same year. Liébert's design eschewed reflected light in favour of direct solar illumination, while retaining a geared drive system—hand-cranked—to keep the condenser lens pointing directly towards the sun. This direct illumination system significantly reduced exposure times.

Gaston Tissandier, writing in the second edition of his *History and Handbook of Photography*, translated by John Thomson, noted that "enlargements, it is true, offer certain inconveniences; the details of the enlarged proof have often a disagreeable effect; they are exaggerated and seem as though seen under a magnifying glass. It would, however, be unjust, in spite of these defects, to underrate the importance of the results obtained.

Perhaps because of these 'defects'—presumably grain and imperfections in the collodion coating of the negative—solar enlargements, on to either paper or canvas, were often over-painted by studio artists, creating a combination of photography and painting which was sometimes highly successful, but often rather less so!

In the 1870s, numerous photographers advertised this service—offering enlargements from carte-de-visite prints and daguerreotypes as well as existing negatives. Typically, prices in London ranged from two shillings for a 10 × 8 print, up to three pounds for a life size bust "finished in oils." In 1878, R. L. Elliot & Co., of London's King's Road advertised that they could produce prints up to 25" × 20" from quarter plate negatives. Elliot's particular boast was that his enlargements were made using limelight – an illuminant first suggested by John Benjamin Dancer.

The combination of the relatively fast bromide and chloride papers as a replacement for albumen in the 1880s, and more efficient light sources, spurred a number of developments in enlarger design. Early artificial light enlargers were horizontal, looking much like lantern slide projectors, with the image projected on to an easel. With light sources such as limelight, gas or kerosene, the equipment was fitted with complex light baffles and a tall chimney to vent the noxious fumes out of the darkroom.

As the new century dawned, electric lighting was starting to make inroads into daily life and electrically powered enlargers became available, albeit at a very high price compared with their oil or gas-fired alternatives.

JOHN HANNAVY

See also: Bedford, Francis; Dancer, John Benjamin; Liébert, Alphonse J.; Nadar (Gaspard-Félix Tournachon); Quinet, Achille; Stanhopes; and Tissandier, Gaston.

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ENSLEN, JOHANN CARL (1759–1848)

When Johann Carl Enslen took up photography at the beginning of 1839 at the age of 80, and became the first person to make photographic paper prints in Germany, he had already retired—twice—from a career as one of the most remarkable showmen of his generation. His earlier career(s) exemplified the same curiosity and skilled craftsmanship that he brought late in life to photography. At the age of 22 and seemingly without prior experience, he built a *montgolfière* 80 feet high, in which his financier François Xavier Adorne made the 11th successful manned baloon flight from the Finkmatt in Strasbourg on 15 May 1784. Between 1785 and 1800 he travelled throughout Europe with an astonishing collection of flying sculptures, intricate aerostatic figures in life-size and over-life-size made from gold-beaters' skins that were a pinnacle of rococo design and were exhibited hung from threads in large halls with the circulation of an admiring public below causing just enough of a draft that they swayed gently in the air. If the circumstances were right, meaning that tickets could be controlled or underwriters be found, Enslen released his figures in "air hunts" across the city: one performance in Berlin in 1796 attracted some 80,000 of the town's 121,000 inhabitants, and equally extraordinarily crowds were found in London, Vienna, and other cities for his air chases involving a wild boar chased by two dogs, and a stag chased by another dog with a man on horseback behind. His figures, some 30 of which fitted neatly into a hand satchel, also included Mercury, an Aerial Nymph, and Cupid, with the goddess Diana seated in a Roman coach led by two stags his

pièce de resistance, described in contemporary sources in blushingly superlative terms. Around 1788 he began to construct and exhibit automata, and in the 1790s after reputedly buying the apparatus of Paul Philidor in Vienna, gave phantasmagoria ghost-raising shows in Berlin. For the coronation of Franz II in Vienna, he released a gigantic baloon in the form of a colossal temple surrounded by genies and allegorical figures. Enslen's illusions, including a room-sized *camera obscura* entertainment, were always meticulously constructed and brilliantly performed. An admiring Prussian King gave him a large estate near Danzig, where Enslen retired at the age of 46 and turned to astronomical observations of the Aurora borealis, scientific experiments, and the making of moon globes, as a sideline taking over the local iron foundry, expanding it into the largest regional factory with about 60 workers. When Napoleon's troops confiscated his lands and his ironworks in 1807, Enslen returned to the life of a travelling showman, together with his son exhibiting 1 × 4 meter half-panoramas in Germany, central Europe and Italy, retiring for the second time in 1834 to Dresden. Here he published the first of his two monographs on the nature of light and returned to the study of the moon, making seven half-spherical moon globes which were given to the leading observatories of the day, including Greenwich.

Early in 1839, while Daguerre's process was still secret, Enslen began to experiment with photography. He said then and in later years that he followed Talbot's methods, which were first partially communicated to the Royal Society on 31 January 1839, but his inability to fix his images permanently until sometime after March, 1839 has led the historian Stephan Oettermann (see further reading, below) to suggest that at the beginning Enslen was actually following the earliest work of Thomas Wedgwood, and was again, as with his other Dresden activities, picking up one of the scientific interests that had intrigued him during his first retirement at Danzig. From April through the end of the year, Enslen made numerous photogenic drawings by laying out complicated arrangements of pressed ferns, feathers, butterflies and leaves on his salted paper, in a kind of early Biedermeier design. A portrait of Frederick the Great, a head of Christ, a Mary and Child, a view of the market in Dresden, or of the Frauenkirche in Dresden, some also surrounded by ferns and other natural objects, were prepared using engravings made transparent by soaking them in varnish and then laying them out on his photographically sensitised paper, as Niecephore Niepce had done in the 1820s. Enslen's experiments were reported beginning in April, 1839 in newspapers in Leipzig, Dresden, Vienna and elswhere; he assiduously sent photographs to many friends and acquaintances, including one by unknown means to Talbot at Laycock Abbey, a print which despite being properly inventoried there toured America in 1988 as an original Talbot image. Enslen seems to have remained active as a photographer only for about two years: a planned 1841 publication *Anleitung zur Verfertigung von Lichtbildern auf photogenischem Paper* (Instructions for the Preparation of Light Pictures on Photographic Paper) was never printed and its manuscript is now lost. His interest in photography, although indubitably motivated in part by his unflagging curiosity about all kinds of illusions, seems to have been not in exactly reproducing the natural world, but rather in photography as a reproductive process that could replace the printing press and again, like his aerostatic figures, be carried in a hand satchel. He therefore never used a camera but remained dedicated to photogenic drawing.

DEAC ROSSELL

Biography

Johann Carl Enslen was born in Stuttgart on 21 May 1759, but the events of his youth, education and early work remain obscure. Around 1782 he moved to Strassbourg, where just a few months after the first baloon ascent by the Mongolfier brothers the young 24-year-old seemingly without prior training built the first German Mongolfière, in which the eleventh manned flight took place from the Finkmatt on 15 May 1784. From 1785 to 1800 he travelled across Europe with an array of what he called "aerostatic sculptures," baloons fashioned in splendid Rococo style of gods and animals, with which he captivated the leading courts in Paris, London, Vienna and Berlin and whose flights in "air hunts" attracted tens of thousands of spectators. About 1788 he began to construct automats, including a piano player, a mechanical bird and a flute player that inspired Emanuel Schikaneder to form the character of Papageno in his libretto for Wolfgang Amadeus Mozart's "The Magic Flute." Continuing his experiments in physics, optics and mechanics, he opened a theatre in Berlin and gave elaborate and skillful exhibitions of white magic using mirrors, a room-sized camera obscura, and some of the earliest Phantasmagoria lantern apparatus. Wealthy and famous, Enslen retired at the age of 40 and moved to his estate near Danzig, where he took up astronomy, constructed a globe of the Moon and made optical experiments. He became interested in the making of iron and by 1804 owned the largest iron foundry in the Danzig area, with some 60 employees. Three years later his works was confiscated by Napoleonic troops, and after losing his estate he returned to Berlin in 1811 and re-started his career as a showman, building automats, projecting microscopic objects with a solar microscope, and exhibiting a huge relief model of Paris. From 1816 he painted and exhibited a new form of panorama with his son, a half-round panorama about 1 meter by 4 me-

ters, traveling across all of Germany and central Europe and spending 1823 to 1826 in Italy. Around 1834, at the age of 75, Enslen retired for the second time, moving his residence to Dresden. Again taking up astronomy and physical experiments, he published two monographs on the nature of light in 1834 and 1841 and began to experiment with photography in early 1839. Working on paper printing methods he devised his own fixing solution and began producing photogenic drawings in March, 1839, becoming the first practicing photographic pioneer in Germany at the age of 80. His last work was a large copper engraving of a café garden in Dresden; he died on 10 December 1848.

See also: Wedgwood, Thomas.

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EPSTEAN, EDWARD (1868–1945)

Photoengraver, book collector, and translator

Edward Epstean occupies an unconventional position in the historiography of early photography. Neither a collector of images nor academic, nevertheless his elevated linguistic skills and decades-long professional experience as a photoengraver enabled him to become a foremost scholar and disseminator in the interwar years. His translations of key French and German works into English meant that Epstean's influence stretched far beyond his professional circles. Furthermore, thanks to his foresight as a bibliographer and bibliophile, generations of scholars have benefited from Epstean's research collection, donated to Columbia University in his native city of New York.

Edward Epstean began his career in photoengraving in 1892, and therefore lived through the period which saw a huge expansion in halftone printing. His scholarly bent gave him the impetus to constitute a personal library in the field: "It was the need for a thorough theoretical understanding of the reproductive processes by photography, in which I have been engaged for some forty-five years, which led me to bring together these books" (Foreword, *A Catalogue of the Epstean Collection*, New York: Columbia University Press, 1937). However, a cursory glance at the subject matter of his collection makes plain that it had long outgrown the requirements of a working library to encompass the full scope of photographic science, history and applications. In fact the photomechanical processes and colour printing comprise barely a fifth of the collection.

Epstean's breadth of vision was matched by the assiduity with which he set about constructing his collection, in particular literature from the earliest years of photography. His professional contacts enabled him to add to his holdings the libraries of Stephen H. Horgan, William Gamble and Josef Maria Eder. His French holdings were consolidated with the acquisition of a private French library, including duplicates from the collection of Gabriel Cromer (1873–1934) gathered by Kirkor Gumuchian (1886?–1949), then a bookseller in Paris but who would move his stock and selling operation to New York City on the eve of the second world war. Epstean was ably supported in his endeavours by John A. Tennant, a New York bookseller and publisher of *The Photo-Miniature* from 1899 to 1939. When Epstean decided to place his collection, he was fortunate in having as a negotiating partner Hellmut Lehmann-Haupt (1903–1992), an outstanding historian of printing and rare books curator at Columbia University from 1930 to 1937. Lehmann-Haupt recognised the significance and value of Epstean's library for research and oversaw the integration of The Epstean Collection, as it became known, into Columbia University library in 1934. A bibliography of the collection was published in 1937 while Epstean, viewing the collection as a work-in-progress, continued adding to the holdings and provided annual funds for further acquisitions. By the time of his death, the collection numbered some two thousand titles comprising three thousand volumes.

In parallel to his collecting activities, Epstean undertook a series of translations, introducing the English-speaking world to important photohistorical studies by Victor Fouqué, Georges Potonniée, Erich Stenger and, most notably, Josef Maria Eder. The impulsion came on a visit to Eder in Austria in 1932, and by 1934 Epstean had completed a draft translation in longhand of the fourth edition of Eder's monumental *Geschichte der Photographie* (History of Photography). For copyright reasons and "the changed political conditions in Germany," the work was not published by Columbia University Press until 1945. Epstean used the interval to ensure full revision and technical editing by several leading photographic scientists, with the result that Eder's work, in Epstean's translation, gained broad acceptance in the English-speaking world as the standard work in the field. It had no peer as a single-volume comprehensive survey until Gernsheim's *History*, and even sixty years later has not been fully superseded.

Epstean was conscious of the pitfalls of translating technical texts, stating that he found it "extremely

difficult to steer a middle course" between literal and stilted transliteration and freer interpretation which risked traducing the author's intent. He rose to the challenge both in translations from German and from French, publishing successively two key texts on the origins of photography: Fouqué's work on Niépce *La Vérité sur l'invention de la photographie* (The Truth Concerning the Invention of Photography) in 1935 and Potonniée's *Histoire de la découverte de la photographie* (History of the Discovery of Photography) a year later. Epstean's manages to respect the source texts while rendering them in readable English. Integrity of another kind was required of him in his final translation, that of Erich Stenger's *Die Photographie in Kultur und Technik: ihre Geschichte während hundert Jahren* (The History of Photography: its Relation to Civilization and Practice). He steered it through the press in 1939, a year after the German original, in the teeth of mounting opposition, not least from the American publishers. Epstean was a proponent of the universality of scholarship, and placed his personal commitment above political antipathies. As a concession to Anglo-American sensitivities, the preface to the German edition by Heinrich Hoffman was omitted, but otherwise the source text remained unaltered.

Epstean's contribution to scholarship was recognised in his lifetime with the award of the Davanne medal by the Société française de photographie and honorary fellowship of the Royal Photographic Society. After his death, Epstean's archive was turned over to Columbia University library. It contains material relating to the acquisition and donations of his books, typescripts and offprints of his articles and speeches as well as the typescript and galley proofs of the Eder translation.

STEVEN F. JOSEPH

Bibliography

Edward Epstean was born in Bohemia on 19 September 1868. He emigrated to the USA in 1888 and received his naturalisation papers five years later. In 1889 he went to work for the electrotyping firm of Hopkins & Blaut, founding their photoengraving department in 1892. In 1898 Epstean set up, with H.L. Walker, the Walker Engraving Company, incorporated in 1928, of which he became director and treasurer. Epstean married Josephine A. Kupfer (died 1942) in 1890. Epstean died at his home in New York City on 7 August 1945.

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ERMAKOV, DMITRI (c. 1845–c. 1916)
Chronicler of the Caucasus

Ermakov was born between 1845 and 1848 in Tbilisi, the son of Ludwig Cambaggio, an Italian architect, and a Georgian mother of Austrian descent, who was a noted pianist. She remarried with one Ermakov, whose name her son Dmitri took.

Among the schools where Ermakov as a young man received training was the Military Topographic Academy at Ananuri, at the foot of the Caucasus Mountains, 102 kilometers north of Tbilisi on the Georgian Military Highway. In Ermakov's estate various albums are to be found with photographs of this military highway and a number of views on and around this route. Most likely Ermakov took his first steps toward his future profession as photographer while at this academy. By that time every military academy in Europe had its photographic department, to serve the needs of cartography and for the production of maps and topographic files. Moreover, experiments were being done at these institutions with new photomechanical reproduction techniques for the production of map material. Photography was also found extremely well suited for reconnaissance in conflict situations and regions.

Ermakov left the military school toward the end of the 1860s. Shortly thereafter, around 1870, he opened his own photographic business in Tbilisi, the city of his birth and the capital of Russian-controlled Georgia. The studio was located on the Dvortsovaya, a street where various photography studios had been established for many years, and which drew many visitors. As early as 1846 a photography studio had been opened there, operated by Henry Haupt and I. Aleksandrovski. The photographers V. Khlamov and A. Roinashvili followed in the ensuing years. Ivanitski also set up there in 1863. Roinashvili was in fact the first photographer of Georgian extraction. He called his studio "Rembrandt," a good indication of his ambitions and the seriousness with which he practiced his trade. It has been suggested that Ermakov took over some of Ivanitski's stock, particularly the many portraits of ethnic types, and also stock from Roinashvili. Such files of negatives were, after all, the most important business capital for photographic studios, and often remained in use for decades. It is thus quite possible that Ermakov took over an existing studio, and/or all or part of an older inventory. That was the accepted practice in this period, during which professional photography studios were taking off in a big way all over the world.

Several years after opening his studio Ermakov became a member of the Société française de photographie (SFP) in Paris, the most prestigious photographic association in Europe. Who had nominated Ermakov for membership—there was after all a strict admissions

policy—is, alas, unknown. He submitted work for the SFP's biennial exhibition in 1874, reporting Trebizond, on the Turkish coast of the Black Sea, as his address. That could mean that he had opened a branch or second studio there, because he had already photographed considerably in that region. All the pictures that he sent to the Exhibition in Paris—17 in total—were made in that area. According to the catalogue they were prints from wet collodion plates. For the rest, this was the only time he submitted work for the SFP exhibitions in Paris. A couple of years later, in 1878, the took part in the Anthropological Exhibition in Moscow, where he received an honorable mention. He would also receive distinctions at photography exhibitions in Turkey, Persia and Italy.

In the years 1877 and 1878 Ermakov received an exceptional commission: he was added to the General Staff of the Caucasian Army, in the Field Photography Section, to record military movements in the Russo-Turkish war. None of the photographs he produced for this have been located.

During his working life Ermakov must have traversed huge distances. If we look at the photographs in the albums in his collection, it would appear that he had a great interest in geography and ethnography in the whole of Eurasia. In addition to Georgia itself, he traveled through Turkey and Persia, to Kazakstan and Uzbekistan to visit the ancient cities of Bukhara and Samarkand, through the southern Russian republics of Dagestan, Ingushetia, North Ossetia, Cherkessia, up to Krosnodarskij and through the Crimea, to the north of Georgia. Apparently here he was himself at work with one or more assistants. It is also possible that he sent his co-workers to these various places. Perhaps some of the photographic material in the albums also comes from other photographers, from whom he purchased negative plates. The result was an enormous photographic oeuvre which can be termed extensive and multifaceted. He records the inhospitable, snow-capped mountain ranges of Svaneti, the oil fields in Baku and the construction of drilling rigs, the 1905 pogrom in Baku, the architecture, churches and monuments in all these regions, art reproductions and extensive surveys of the peoples from these areas in long series and detailed reportages. All these series and still many more other subjects are to be found in Ermakov's 126 sales albums. They contain an almost incalculable treasury of information about a number of regions and peoples in the Caucasus, Turkey, Russia, Persia and the surrounding area.

These trips were no simple undertaking. The photographer worked with large glass plates (often handled wet), employed cameras of various formats, and always had to have his chemicals and darkroom near at hand. Ermakov in fact worked with glass plates of up to 50 × 60 cm. In the 19th century photography had not yet mastered enlargement. All prints were produced in the same dimensions as the negative plate; Ermakov thus must have used a mammoth camera. This also means that for his work he must have had a sort of caravan with him in order to carry all his apparatus, as well as a mobile darkroom. It is reported that Ermakov himself specially designed such a mobile laboratory. To have carried out all the work of his that has been located, that was certainly no unnecessary luxury. He returned from an expedition to the mountains of Svaneti in 1910 with as many as 1500 negatives. It is obvious that Ermakov also did business elsewhere for periods of time, or had multiple branches, as in Trebizond, mentioned earlier, but certainly also in Teheran, where he received the title of Court Photographer to the Shah of Persia. Photographs by Ermakov are to be found at the University of Teheran.

Ermakov ultimately operated a large photographic business over the remarkably long time span of about 45 years. Over this period he must have produced at least 25,000 negatives: that is, after all, the number that have been found in his estate. His interests, however, also ran well beyond photography. He was an honorary member of the Caucasian Section of the Moscow Archaeological Society and the Association for the Advancement of the Visual Arts, and he was given the freedom of the city of Tbilisi. It is not known precisely when Ermakov died; it must have been around 1916/1918. His extensive estate was sold to the University of Tbilisi by his widow and in 1930 eventually handed over to the Simon Janashia State Museum in Tbilisi.

HANS DE HERDER

Biography

Dmitri Ermakov was born between 1846 and 1848 in Tbilisi (then called Tiflis) Georgia. After his initial education in his hometown he joint the Military Academy in Ananuri, an old town and fortification along the Georgian Military Highway. This route is one of the eldest pass ways through the Caucasus mountains and connects Tbilisi with Vladikavkaz, capital of North Ossetia. After serving as a military photographer he established his own firm in downtown Tbilisi. He traveled extensively through the Eurasian continent and he was the Persian court photographer for a number of years. Back in Tbilisi he educated and later collaborated with Antoin Sevruguin who became a known Persian (although not from Persian descent) photographer. Little is further known at this moment about Ermakov's whereabouts. The estate is researched and conserved for the future since 2000 and will be presented to Unesco to be listed on the World Memory List expected in 2007.

Collections

The main body of Ermakov's heritage can be found at the Simon Janashia State Museum in Tbilisi, other parts are at the Museum of Tbilisi's History and the Museum of Art, the Tbilisi City Archive has a small collection as well, although this may have been destroyed during the civil war in the 1990ies. From his days as court photographer to the Persian Shah, prints and albums can be found at the Golestan Museum in Tehran.

A substantial print collection can be found at the Russian Museum of Ethnography, St. Petersburg, Russia.

Smaller collections are at the Rijksmuseum, Amsterdam, the Netherlands and at the Phototheque in Paris, France.

See also: Société française de photographie.

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EROTIC PHOTOGRAPHY

The production of erotic photography is nearly simultaneous with the invention and development of the photographic medium. Almost immediately, this new technology made clear the erotic nature of visual imagery and the heightened pleasure of looking at images with a direct documentary link to the experienced, both real and imaginary. This "indexical" relationship made erotic photographs far more provocative than nude paintings but also became a central impediment to their production and circulation. Though erotic pictures in the form of lithographs and frescoes had long existed,

Attributed to Felix Jacques Moulin and Attributed to Achille Quinet. Nude.
The J. Paul Getty Museum, Los Angeles
© The J. Paul Getty Museum.

Abigail Solomon-Godeau suggests that photographic technologies inaugurated an entirely new vocabulary of sexual imagery.

Residing somewhere between visual pornography and the photographic nude, erotic photography may be most clearly distinguished through an analysis of its production and consumption, with particular focus upon issues of subjectivity and spectatorship. Unlike the explicit sexuality of pornographic representation, erotic photographs leave something to the imagination, generally favoring strategic covering and subtlety over excess and consummation. Though erotic photography expresses interest in eliciting a sexual response from the viewer, it refrains from depicting sexual activity.

Whereas nude photography makes no pretense to narrative or fantasy, erotic images often use staging and posture, props and fetishes. Rejecting the academy figure's demure and modest view-from-behind, erotic photography depicts a model whose more direct engagement with the viewer—or voyeur—sets the libidinal terms of the exchange. Many critics contend that the boundaries between visual pornography, erotic photography, and the academic nude cannot be clearly determined and therefore recommend situating these genres along a spectrum rather than in strict categories. To be sure, even the fully clothed body, landscapes—such as those by Pictorialist Clarence H. White (1871–1925)—and the elegant corporeal curves of the domestic still life may also stage the viewer's desire, provoking emotional responses not unlike those evoked by erotic photography's staple image of the female body.

Erotic photographs first appeared in France around 1845 and soon after in England. Despite mechanical complexities and a delicate product, daguerreotypes featuring erotic images were soon sold by Paris opticians and art dealers. The daguerreotype process was available to the French public without franchise and, recognizing the enormous commercial potential of erotic photography, an underground market quickly blossomed. The use of *études photographiques* by painters such as Edgar Degas, Gustave Courbet, and Jean-Auguste-Dominique Ingres legitimized the production of nudes, though typical erotic photography was not concerned with classical ideals, proportional exactitude, or, necessarily, the beauty of the human form. As early as 1845, Eugène Delacroix and others used *académies*—academic studies of nude or partially dressed models—in lieu of living models, and it was not long before non-artists used them as objects of voyeuristic gratification.

Inevitably, soft-core pornography was sold under the misonomer *académies* in order to circumvent bans on such material. According to Elizabeth Anne McCauley, by 1852 and 1853 French laws against photographic nudes were "inconsistent and poorly defined" with recourse made to pre-existing laws such as the eighteenth century prohibition against "obscene images, prints, or drawings" or the 1810 Code Napoléon, an injunction barring the sale and distribution of visual or written material without the name of its creator. Circuitous methods of controlling such images—such the extension of copyright laws and mandatory registration of photographic prints at the Ministry of the Interior—were meant to compensate for otherwise permissive attitudes about depictions of nudity. "Artistic studies" of nudes, unlike transactions around "obscene material" were legitimate as long as they complied with "certain unstated and ambiguous rules of posing." Public condemnation was more prevalent than prosecution, though seizures of

photographic nudes were made and police increasingly used registries to follow the manufacture and distribution of nude and erotic images.

In an effort to articulate the qualities of erotic photography, critics note its characteristic proximity; where nudes are compositionally featured at a distance, erotic photographs play with closeness as a means of alluring the viewer. Michael Koetzle builds upon erotic photography's tactic of the "strategically veiled," identifying the integral role of stockings, veils, garter belts, and fans in what he calls erotic photography's "boudoir effect." In such images, a closely cropped visual field constrains the woman in its space, offering her up to a viewer who then sees her body as would a voyeur peeking into a boudoir, and who may construe the proximity as an invitation to intimacy with the titillating possibility of tactile interaction.

Because all erotic photographs before 1860 were daguerreotypes, they served as pleasure commodities for those who possessed both capital and space in which to collect and display such material. Indeed, social advocates showed the greatest concern for the effects of such images on the lower class population, as its lack of education and refinement translated into deficient moral probity. As such, class-related concerns with virtue and morality increased as advances in technology rendered erotic photography accessible and affordable for practically everyone. As models were often also prostitutes, actresses, and dancers in vaudeville shows, their socioeconomic status only served to confirm class biases.

Improved and cheaper technology popularized the medium, allowing the exploitation of its commercial potential and, by extension, the images it produced. With the development of the collodion process and other chemical and technical innovations, the daguerreotype's labor-intensive one-offs were supplanted by negative/positive process enabling the limitless production of one image. New technology and professionalization facilitated new formats in which to circulate erotic photographs, and soon images appeared as *cartes-de-visite* and stereoscopic photographs.

Prevailing interest in colonial documentation, ethnography, and the orientalized "other" occasionally manifested in erotica in the form of "exotic" tableaux. Animal skins, feathers, beads, tapestries, and scarves converged as coded intersections of the foreign and the erotic. The relaxed sexuality of Baron Wilhelm von Gloeden's (1856–1931) albumen prints of Sicilian boys lounging in the sun on leopard skins exemplifies this interest in the eroticized Mediterranean "other," as well as the medium's preoccupation with prepubescent bodies and homoerotic representation. Baron von Gloeden's models epitomize the docile and feminized eastern male of nineteenth century colonial imagination. Still, the female body was almost without exception the central preoccupation of nineteenth century erotic photography. As John Pultz notes, photography itself attended the shift away from the male nude, whose smooth, muscular physique had exemplified beauty since classical antiquity.

Perhaps fear of prosecution or social stigmatization accounts for the dearth of historical records on those who actually produced the genre's profusion of images, for both the Kinsey Institute's archive and the Uwe Scheid collection contain abundant erotic photographs by anonymous artists. Still, the work of Lewis Carroll (1832–1898), Julia Margaret Cameron (1815–1879) and Viscountess Clementina Elphinstone Hawarden (1822–1865) reveals the Victorian era's interest in the vulnerability and sexuality of children. Even while such work is considered artistic photography, soft light and mirrors conjure a sensual ambience, demonstrating a shared vocabulary with erotic photography. Foregrounding the link between commodity culture and "woman-as-spectacle," nineteenth century erotic photography serves as milestone in the history of a prosperous and enduring industry.

ANNALISA ZOX-WEAVER

See also: White, Clarence Hudson; Daguerreotype; Degas, Edgar; Courbet, Gustave; Delacroix, Ferdinand Victor Eugène; Copyright; Cartes-de-Visite; von Gloeden, Baron Wilhelm; Dodgson, Charles Lutwidge (Carroll, Lewis); Hawarden, Viscountess Clementina Elphinstone; and Cameron, Julia Margaret.

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ETHNOGRAPHY

From its beginnings photography was considered as a handmaiden of arts and science and was widely used as an instrument for the gathering and cataloging of the scientific data so prized during 19th century. People were no exception to this cataloging which could take place with never before seen tribes of dark Africa, as well as with western countries peasant, or even urban lower class populations. Commercial and amateur photographers, scientists and explorers all were engaged in this picturing of the other, creating and perpetuating stereotypes of childlike Africans, vice burdened Chinese, noble savage North American Indians or southern Pacific Venuses. Even if the scientific value of this view of the other by the "Euro American" eye has been questioned for a long time; these images have now an increased significance.

After all are not all photographs of ethnographic value, don't they all show habitats, behavior and costumes of human groups?

Since the 15th century Westerners had traveled though the world. No continent or ocean seemed to be unknown to 19th century cultured people. However everything was again to be discovered, with new media, including the mass use of press and photography which allowed new forms of knowledge and a wider audience for that knowledge. The white man was, for the first time, discovering interior Africa; North America, Asia and Australia had yet to be explored fully. If new lands with high waterfalls, huge mountains and rivers interested the public nothing could be of greater curiosity than their inhabitants; people with strange habits, odd clothing (or no clothing at all). These people were to be found in all continents, from dark, wet and warm Africa, to arid and dry Central Asia, exotic Far East, high South American mountains, or even North American prairies, not to mention European countryside. They all were enduring the shock of being found by modern civilization, they all were to disappear, at least as bearers of those exotic and inferior habits.

This idea of photographing a vanishing world was of greater importance for these photographers and connected the images of these exotic peoples in far away places with folk habits and costumes that were closer to home.

Ethnography and photography were not only children of the same century, but also of the same decades. They both came to public eye around 1840; they were both the products of 19th century's scientific obsession. It is impossible to image ethnography without photography, but it is also hard to imagine 19th century photography without its ethnological uses, where art and science were very hard to tell apart.

Ethnographic photography was a tool both for colonialism and imperial ambitions, of national identification and nationalist construction. All parts of the world were the subject of this photography pursued, like one of the most important missions of photography, by amateurs and professional photographers, by travelers and scientists. In these images persons were not seen as individuals, but rather as representing ethnic, regional or professional types. The ambition was to gather a worldwide catalogue of races, ethnic groups and types, which, after all was not far from happening. Louis Figuier, author of the 1873 book, *Les Races Humaines*, wrote about the need of an ethnographic collection obtained by means of photography, by the same time T. H. Huxley was commissioned by British Imperial authorities to create a photographic fund of all the races of the British Empire.

Scientists and explorers used photography as an instrument for the research and knowledge spreading they pursued. Its objectivity would allow the most accurate record of people and places they were exploring. However photography could also be seen as the power demonstration of the western white power over the barbaric non-white, and as a means of bringing light, another way of spelling Christianity and civilization, over these peoples. Being a godlike, light based, technology, photography was seen *per se* as able to bring the light of civilization to the darker, uncivilized parts of the world.

The control over those photographed enforced by the photographer was a part of the white upper class westerner power over the other. The power needed to make people pose to the photographer was a part of the wider colonial or ruling class power. The eye of the photographer and the eye of the camera were analogous to the eye of the surveillance needed to ensure control over lower class and colonial people.

One of the first references of the use of photography for the study of other people was made as early as 1852, in the *Manual of Ethnological Inquiry*, published in 1852 by the British Association for the Advancement of Science, nevertheless the real uses were not yet common, due to the technical problems of using photography in the field. However, the camera was a mandatory piece of equipment for late 19th century explorers, scientists and travelers, photography was much easier with dry-plates and handheld cameras.

When in 1885 Luanda based commercial photographer published his book on Portuguese western Africa, Luciano Cordeiro, a well-known writer stated this work to be not only a crucial one in Portuguese colonial aspirations, but also the first such work to be carried in the depths of the Dark Continent. He was, of course, wrong, black Africa was not the primary focus of photographers, but expeditions carried out since the 1850s has been using photography has a mean of documentation and report about places and people found. David Livingston's Zambezi Expedition, in 1858–64, has Livingston's brother, Charles as the official photographer for the expedition. Livingston's idea was to use the expedition as means to increase knowledge about Africa. Photography was to be instrumental in that goal so he instructed his brother to have the equipment ready to "secure characteristic specimens of the different tribes." Unfortunately, only the photograph of a baobab tree survived.

Some decades latter, John Kirk, also exploring Zambezi River also used photography, in his images people were displaced from their environment, and places were photographed as if they were empty of people.

James Chapman also used photography as part of his hunting and trade expedition in South Africa's interior in the years 1859–63. Luciano Cordeiro was, indeed wrong stating Cunha Moraes work to be the first in Dark Africa's interior, however, he was not wrong when describing the enormous difficulties endured by an 1870's photographer inside dark, humid and warm Africa. At the time the biggest colonial power (British empire), and the least powerful one (Portugal) rivaled about some African territories and being first was important, even if the words of Luciano Cordeiro are, most likely, a proof that these early African photographs were never widely known.

All these images of Africa were important to enforce already existent ideas of African people as idle and childlike, due to the fertility of the land. Europeans had a mission, bring civilization to these childlike retarded people. They were also important in the creation of a colonial ideal in European powers.

America, opposed to colonial Africa, was composed of independent countries, all of them recently created by the descendents of European settlers, with European cultures and languages. These new world countries had much different situations for their Indian population. Some of them had already destroyed most of their native population, some were in the process of doing so, while in others, such as the Andean countries, Indians were an important part of the population. Photographing South American Indians was not an enterprise for the explorers, but mainly to commercial photographers. Most of these established themselves in South American countries coming from Europe and using the photography of the native as a commercial venture. Photographs were being made to generate profit, as they were sold as *carte-de-visite*, stereographic views and later as postcards. The main goal for most of these images was a commercial one, but these images were important in the building of national identities for those countries. The context of their production and circulation would make them closely linked to the cultural stereotypes already present for those people. These links with existent stereotypes would also show in the idea that images could be, when not available, created. Margarita Alvarado, in her study on the Chilean Mapuche Indian image, found pictures with white people appearing in Indian costumes, composed images, in what she calls the construction of an imaginary image. This imaginary image was the product of the same commercial photographers, mostly European newcomers, who were making the portraits of white people living in Chilean small towns. Brazil, had to deal with three different kinds of population: The little known Indians, the Negro slaves and slave descendents and the new European migrants. All of then were potential subjects to ethnographic photography, all of then were in need of surveillance and control. José Christiano Junior, himself a Portuguese migrant made studio portraits of slaves in the 1870s, at about the same time, Militão Augusto Azevedo, a S. Paulo native, although based in Rio, photographed non slave Negroes. These were commercial photographers and these photographs were made using the same techniques used on their portrait sitters. The photographs of Brazilian Indians were quite early in photography's history; the E. Thiesson expedition of 1844 came with full face and profile daguerreotypes of Botocudo Indians, complementing skeletons, now in Paris Museé de l'Homme.

The North American West was, during 19th. Century, less known than South America. White settlers were starting their western migration. Much of midwestern land and of their peoples were unknown to east coast society. Exploration photography was of great importance to the knowledge of the west, and to the building of United States and Canadian identity. Even if there were a huge number of different people, the North American image was made, above all with landscape photography. There is an exception in the huge survey on the American Indians made by Edward S. Curtis, even if it is mostly a 20th century enterprise, is close enough to 19th century ethnographic photography. The photographs made of California Indians from 1900 by Alfred Koeber have similar goals, although a smaller scope. These surveys were made not on a vanishing world, but on an already vanished world, since American Indian were all but destroyed as autonomous entity by 1900. This may explain the small number of Indian photographs in 19th century Western images, including surveys on New Mexico, Utah and Nevada Indians,

Uncatologued (Photographer). Indian peasent young woman holding twigs on her head.
The J. Paul Getty Museum, Los Angeles

and some anthropometric photography carried out by W. H. Jackson. Indians were seen has hostile savages; there was a war waging on them, they had no place in the new civilized world being built by the white man. The fact that some of 19th century photographs would show Indians in "civilized" costumes is a confirmation of this idea. As they were physically exterminated, they had little or no place in photography. In the early 20th century the Indian was no longer a treat, but little more than a memory, or a folk character, so Curtis could photograph to preserve that already vanished world. His work was a huge exploit, consistent with the idea of having all the races and tribes in one nationwide catalog, however his Indians would not, most of the times, use those costumes or live in the way depicted by his photographs. His pictorialistic approach is also seen as a handicap to the ethnological value of his photographs, even if it does enhance their art value.

The main interests of European photographer were, however, focused on the old world. Orientalism was at his height and photographers saw in the Holy Land, Egypt, but also Far East, a first choice location for photographs. The mideastern landscape was in focus, as well as mid eastern people, whose habits and costumes were, 2,000 years later, reminders of biblical scenes, many of these photographs actually ended up being used as biblical illustrations. More than in any other places of the world, most of these stereotypes were drawn from the previous repertoire of themes known to Orientalist and biblical scene painting. Western view of mideastern historical significance was, also, of major influence in the way its inhabitants were perceived and photographed. Religion was a major force driving mideastern ethnographic photography. In complete opposition of this use was the construction of a mideastern erotic image, being built over the exotic beauty of Arab women, the image of the harem and supposedly scantily clad belly dancers and odalisques.

Mid eastern photographic tours were early in the history of the medium, one of the better known was Maxime du Camp's expedition to Egypt and Palestine in 1848 and 1849, with novelist Gustave Flaubert. Even if his published images were mostly of monuments, there are also images of local people in those monumental

surroundings. Venturesome Europeans had in North Africa and the Middle East a place to visit, particularly after the opening of the Suez Canal, and photography was a particular resource for these travellers; monuments might be the main focus of these amateur photographers, but local people were also an important subject.

Commercial photography had a fast growth in mid eastern societies; one of the best known studios was the Bonfils family in Beirut, which, by 1876 had a mail order catalogue with views of places and people to supplement their portrait studio revenues. The part of revenue generated by these views seemed to be greater than in other places of the world, as there was a good market for them.

Anthropometric photography did also take place, even if it was less common than in Africa, India or other parts of Asia. Ernest Chantre published his *Recherches Anthropologiques dans l'Afrique Orientale: Egypte,* in 1904, based on comparing almost a thousand of modern Egyptian photographs, taken in 1898 and 1899, with measurements made from mummies. The main difficulty was in photographing women, which unfortunately, for anthropometrics, but fortunately for ethnographers, are sometimes photographed wearing their usual face and head covering.

Handheld Kodak cameras in the hand of tourists, or amateur explorers were of more importance in the Middle East then in other farther away places, so much of ethnographic photographs from 1890 on are the product of such amateurs.

Adrien Bonfils, second in the already mentioned Bonfils family generation, wrote that after twenty centuries Palestine was unchanged. That view of the Middle East as an unchanged land, living in a sort of a time warp, is reflected in images of romantic nostalgia. Ethnographic photography here was not in the quest of the unknown, but of the biblical past.

India and the Far East were by their resources in the view of European powers. India was already the jewel in the crown of the British Empire, however its multitude of powers and different people was of great concern to British rulers. *The People of India* was one of the most ambitious of all photographic surveys of racial types, resulting in 8 volumes of almost 500 photographs each, was started as a collection for Lord Canning, India's Governor-General, from 1856–58. However after the Indian rebellion in 1857, it became an official project for the Political and Secret Department of the India Office, showing the close connections of science and surveillance. John Bourne photographed northern India's landscape and people, being his Indian rulers picture series very popular as a souvenir for British officers returning home. In fact local rulers were a major focus for ethnographic photography.

A commercial photographer working in the Far East, John Thomson experienced the magic powers of photography, as felt by the other. He describes how his camera was perceived like a magical thing, and himself like some kind of necromancer. Some of his photographs, and his latter description of a systematized methodology for race type photography would detach his images from ethnography, however he also photographed people engaged in their activities. His images, and accompanying words do also provide negative moral judgments, which were needed as China could hardly be described as an inferior civilization, so the burden of cataloging Chinese as inferior to Euro Americans would have to be put on vice and moral inferiority. China had been opened to Europeans after the mid-19th century Opium Wars, and Felice Beato was one the first and better-known European photographers working in the Far East; China and, since 1862, Japan, where he made his famous photographs, mostly studio portraits, of Japanese society.

European photographers pursued the same sort of "exotic" type photography, they were making in other continents, in southern Europe. Local people, costumes and habits were in focus the same way landscapes and monuments were. The photographs of English photographer C. Clifford and French photographer J. Laurent in mid-19th century Iberia set the standard for photographs of that nature. By the same time Thomas Annan was commissioned by Glasgow City authorities to photograph the city slums before a major renewal, his photographs were mainly of buildings, however some showed their inhabitants. Russian and other Eastern European photographers focuser on their far north or Asian type population. Photographers of the same country produced images of rural and even urban types in Europe, even if they were higher in the hierarchy of races and types. Countries would have their own regional and professional popular types hierarchy, fishermen might have a "higher" position than peasants; some regions, particularly the southern part of Mediterranean countries had a lower position within those countries. Western countries were in the process of industrialization, the rural society was decaying. Like in the images of people recently discovered by "civilization" this entire world was being photographed before it would disappear under the wells of progress. As a matter of fact some had already disappeared and was being recreated just for the picture.

As nationalism emerged as the main political ideology, there was a need to create elements of national, and even of local identification, what E.J. Hobsbawm calls the "Invention of Tradition." Photography played a major role in this; local habits and costumes, real and not so real were the subject of countless photographs from a countless numbers of amateur and professional photographers. Every European country had his major

editions of local and regional popular types in postcards, newspapers, and magazines. Some photography publishing houses relied upon this market for a good part of their sales.

A small part of theses photographs were the product of organized travels, using the train or even bicycles, some were made in response to newspaper-launched campaigns, sometimes reflecting the idea of gathering a collection of all national or regional types. However, local photographers, to supplement the income from their portrait studios, were producing much more. The stress is no longer on racial issues, even if they are sometimes present to tell a country apart from his neighbour, but on professional or local types. Peasants, water carriers, fisherman and even beggars all were in the focus of the photographer. Some types were more in favor of photographers, country women washing in the streams, is one example, the old long bearded fisherman, another, they more the result of a culturally constructed choice than of reality. The Russian empire had the most organized attempt on this nationalist use of ethnographic photography, the *Moscow Ethnographic Exhibition* of 1867, showed, mainly with photographs, the different peoples and professional types of the empire with a pan Slavic imperial idea.

For all these images there were a multitude of different uses, from scientific research to the family albums, postcard and magazine publication. They seemed to be an important part of some local photographers revenue, but there were also amateur photographers mainly concerned with photographing their hometown or village.

Arguably the images made for research are less linked to cultural stereotypes than those made by commercial photographers and amateurs. However, the similitude of ethnographic photographs from around the world is a proof of photography's international character and of its origin in 19th century's ideology. The stereotypes created by 19th century ethnographic photography are sometimes still alive, and had an important influence in how people around the world are perceived. In places from Portuguese fishing villages to Moroccan roads people stand dressed up waiting to get some money from the tourist photographer, they are doing no more than allowing the persistence of 19th century ethnographic type photography.

Nuno de Avelar Pinheiro

See also: Africa (Sub-Saharan); Africa, North (excluding Egypt and Palestine); Anthropology; Austro-Hungarian empire, excluding Hungary (Austria, Czech Republic, Slovakia, Slovenia, Croatia); Beato, Antonio; Beato, Felice; Belloc, Auguste; Bonfils, Fèlix, Adrien, and Marie-Lydie Cabanis; Bourne, Samuel; Brazil; Canada; Chile; Christiano Junior; Coutinho Brothers; Curtis, Edward Sheriff; Egypt and Palestine; Imperialism and colonialism; Notman, William & Sons; Orientalism; Ottoman Empire, Asian; and Persia (Turkey, the Levant, Arabia, Iraq; Iran); India and Afghanistan; Poland; Portugal; Romania; and Russian Empire (all ex-Soviet republics).

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EUGENE, FRANK (1865–1936)

American photographer

Born Frank Eugene Smith in New York, Frank Eugene's long engagement with photography began while studying painting in Munich between 1886 and the early 1890s, and his photographic work echoed many of the stylistic qualities of the pictorial movement of the period. Initially he saw himself as a painter, with photography no more than an abiding hobby.

By the late 1890s, however, he was being described as a 'painter photographer' a term coined specifically for him, as his work bridged the two mediums. His photography often involved extensive afterwork on the negative, using scraping tools and paints to modify the images.

Eugene first came to public prominence in 1899 when an exhibition of his unique approach to pictorial photography was mounted at the Camera Club of New York, and several images were included in the London Salon of that same year. Sadakichi Hartmann observed that "he is essentially a painter, and looks at photography merely as a new medium to express his artistic individuality."

Four examples of Eugene's work was featured in Alfred Steiglitz's journal *Camera Notes*, and he later became one of the most regularly featured photographers in *Camera Work*.

In the 20th century, Eugene became one of the 'American Links' of the Brotherhood of the Linked Ring, and in 1902 a founder member of the Photo-Secession.

John Hannavy

EVANS, FREDERICK HENRY (1853–1943)

British bookseller, photographer

In a lantern slide lecture in 1886 before the Photographic Society of London (since 1894, The Royal Photographic Society of Great Britain), Evans showed photomicrographs made, not for scientific purposes, but as images reflecting his "life-long love and study of 'the beautiful.'" George Smith, proprietor of the Sciopticon Company, had sold Evans a microscope and a camera and produced these lantern slides from platinum prints. Smith stressed the pure or straight approach in photography, and Evans, who lacked art skills, embraced this approach which would define much future photographic art.

The photomicrographs included images of minute shells and sea creatures including a lantern slide titled 'Spine of Echinus,' c. 1886, a cross section magnified 40x which readily suggests lace work, a mandala, or a rose window. The Photographic Society recognized the aesthetic achievement and awarded Evans their medal in 1887.

Evans, a respected London bookseller, turned his camera from photomicrography to cathedrals, where he often used an 8 × 10 inch plate camera with a lens selected to fill the frame before making a lengthy exposure. He claimed to practice "cathedral picture making" rather than "mere photography."

Evans immersed himself in cathedral towns for days as he experienced the sacred buildings emotionally while noting locations and lighting for eventual picture making. Perfectionism might have led to sterile records, but he was aiming for platinum prints, platinotypes, which would convey the same emotional response in the viewer that the original evoked. While interested in Emanuel Swedenborg's mysticism through James Garth Wilkinson's writings, Evans maintained his photography concerned beauty, not devotion.

Sprituality through symbolism, however, seems integral to this beauty, as seen in the soft grey tonal passages from dark to light that frequently suggest upward progression.

An example is "Lincoln Cathedral Stair in the S. W. Turret," 1895, which shows narrow spiral steps countered by pointed rib arches, an image suggesting theories of coincidence in nature from Charles Baudelaire to Symbolist poet and critic Arthur Symons whom Evans photographed. "Cathedral picture making," then, relates to the Symbolist photographs of Alfred Stieglitz, and find kinship with such Edward Weston images as "Chambered Nautilus," 1927, and "Artichoke Halved," 1930.

Lincoln Cathedral was the subject of some 120 lantern slides shown at the Royal Photographic Society in 1899. Among the images was "Lincoln Cathedral: From the Castle," 1898, where the dark patchwork of rooftops gives way to the light filled hazy view of the massive cathedral as a sign of the sacred Medieval world contrasting and towering above the profane industrial age.

This photographer's quest for beauty and the ideal included the grotesque wall sculpture in cathedrals which he photographed from slightly below to convey the viewer's perspective. Such photography without resort to dramatic effects treads a narrow line between record and artistic interpretation.

Recognition of the grotesque and its resolution in portraiture is found in "Aubrey Beardsley," 1894. Evans was attempting a portrait of the artist , whose career he helped launch, and supposedly likened the gaunt young man to a gargoyle, whereupon Beardsley struck the pose of a grotesque on Notre-Dame, Paris. The resulting photograph is equally a portrait of the artist's elongated hands—suggesting gothic ribs—and his beak-like profile with the overall image communicating Beardsley's avowed commitment to the grotesque.

Though Evans's portraits are mostly of friends, he believed that portraiture, more than architecture, offered photography's greatest potential for art. He wrote in the *Amateur Photographer*, "What is wanted in portraiture is the portrait, and nothing more; no obvious intrusion, that is, of the personality of the producer; a true portrait, of course, an evocation, true to the spiritual and mental as well as the physical" (Evans, 11 Feb. 1908, in Hammond, Texts, 101).

Evans's approach to landscape is reflective of pictorialism with its continuation of the picturesque. When photographing woods, however, Evans expressed a Symbolist idea of seeing natural forms as relatable to cathedrals, and so *In Redland Woods*:

> Surrey, 1894, a pathway forming an orthogonal is surrogate for a nave with the tall trees rising to a leafy vault. For some of his landscapes he used a soft focus portrait lens, such as New Forest, 1891, showing intertwining trees whose forms suggest the strainer arches in Wells Cathedral.

While Evans favored the vertical format, he framed the picturesque 'Kelmscott Manor from the Thames,' 1895, with curving road, river, and silhouetted trees leading to this home of William Morris, leader of the arts and crafts movement. Evans knew Morris and photographed Kelmscott's interiors including the attics ca. 1897. In these photographs he transfers his sense of light and form from great architecture to the vernacular of private spaces and was no doubt influential on Paul Strand and Walker Evans. Though bound to a modern, mechanical medium, Evans shared much of Morris's philosophy along with that of John Ruskin and the Pre-Raphaelites with their detailed rendering of the natural world as metaphor for the spiritual.

The quest for "cathedral picture-making" is demonstrated with Evans's dissatisfaction with the photograph "Wells Cathedral: Stairs to Chapter House," 1899. He

Evans, Frederick. In the Attics. *The Metropolitan Museum of Art, Purchase, David Hunter McAlpin Fund, 1968 [68.519 (26)] Image © The Metropolitan Museum of Art.*

tried again c. 1900, this time framing a more unified sweep upward and through the light-filled passageway. Finally, he achieved the noted "A Sea of Steps," 1903, that takes a lower viewpoint and emphasizes the rhythms of the foreshortened stone steps while stabilizing the image with the engaged columns terminating with the light-bathed Tudor arch.

In 1898, Evans retired from his bookstore . His stature as an internationally renowned photographer was recognized with his election to the Linked Ring Brotherhood with whom he exhibited and designed innovative exhibitions. He was the first British photographer published in *Camera Work*, in 1904, and Stieglitz proclaimed him the leading architectural photographer. In this period he accepted commissions from *Country Life* magazine for landscape and architectural photography in France. He published some 100 articles on technical and aesthetic issues, many for the *Amateur Photographer*.

By the start of World War I, Evans's health had worsened, and it was difficult to obtain platinotype paper, and so, he retired from photography. In 1928, he was elected an Honorary Fellow of the Royal Photographic Society. Following his death in 1943, the Society held an Evans symposium and published memorial articles which launched a renewed interest in this photographer whose images and writing helped establish pure photography as art.

JOHN FULLER

Biography

Frederick Henry Evans was born 26 June 1853. He worked in a London counting house, but poor health led him to bookselling, where his self-acquired knowledge attracted noted writers including George Bernard Shaw, a strong advocate for photography as art. Evans began photography in 1883, at first photomicrography and then architectural, landscape and portrait work.

Lacking traditional art skills, he practiced pure or straight photography, and published over 100 articles mostly on photography. He retired from bookselling in 1898, and moved with his family to near Epping for health and photography. His photographs won international acclaim, and in 1900, he was elected to the Linked Ring Brotherhood. Evans's exhibit design and multiple mounting techniques showed relationships to the arts and crafts movement. He was recognized as the greatest architectural photographer. By World War I, he essentially retired from photography, and in 1928, he was elected a Fellow of the Royal Photographic Society of Great Britain. He died in London 24 June 1943, two days before his 90th year.

Selected Individual Exhibitions

1899 Architectural Club, Boston
1900 Royal Photographic Society, London
1904 Camera Club, London
1913 Amateur Photographer "Little Gallery," London
1917 Hampshire House, London
1919 Westminster Abbey photographs at Royal Photographic Society, London
1922 Royal Photographic Society, London
1932 Photographic Society, London
1933 Manchester Amateur Photographic Society

1944 Memorial Exhibition, Royal Photographic Society, London

Selected Group Exhibitions

1890 Royal Photographic Society Annual Exhibition, London
1891 "At Home Portraits," The Photographic Society, London
1892 "Invitation Exhibition," Camera Club, London
1894 Photographic Salon, London
1899 American Institute, New York
1901 London Photographic Salon
1903 F. Holland Day Studio, Boston
1906 Little Galleries of the Photo-Secession, New York
1910 "International Exhibition of Pictorial Photography," Albright Gallery, Buffalo, N. Y.

Selected Works

In Redland Woods, Surrey, platinum print, 1894 Lincoln, Stairs in S. W. Turret, platinum print, 1895 Kelmscott Manor from the Thames, platinum print, 1895 Lincoln Cathedral: From the Castle, platinum print, 1896.
Kelmscott Manor: Attics No. 2, platinum print, 1896 A Sea of Steps, platinum print, 1903.

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See also: Lantern Slides; Photographic Exchange Club and Photographic Society Club, London; Platinum Print; Landscape; Pictorialism; and Brotherhood of the Linked Ring.

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EXHIBITION OF THE WORKS OF INDUSTRY OF ALL NATIONS, 1851: REPORTS BY THE JURIES

The Great Exhibition held in Hyde Park in London between May and October 1851 acted as a milestone both for the rise of photography and for its position within international industrialisation. It provided the first major display of photographs to have a significant effect on an international scale. It also spawned one of the landmarks in 19th century photographically illustrated books, the special presentation copies of the four volume *Report by the Juries. Great Exhibition of the Work of Industry of All Nations* published in London by the Commissioners for the Exhibition of 1851 (Royal Commission) in 1852.

Photography had already had a significant effect on the creation of illustrations to printed publication on the Crystal Palace prior to the publication of the *Report by the Juries*. John Tallis had used Daguerreotypes taken by E. Fehrenbach, Richard Beard, W.E. Kilburn and J.J.E. Mayall to create steel engravings for the illustrations for *Tallis's History and Description of the Crystal Palace* (3 vols.) John Tallis, London and New York [1852]. In June 1851 photographs by Philip Henry Delamotte (1820–1889) of the exhibition building in its different stages—and of pieces of the sculpture to be exhibited were displayed at a *conversazione* of the Society of Arts in London. However, Delamotte's images were not used to illustrate the *Reports by the Juries*. This honour was bestowed on probably three photographers. Some forty-three of the photographs can be accredited to the Frenchman Claude-Marie Ferrier (1811–1889) while a further twenty-eight can be attributed to Hugh Owen (1808–1897), an amateur photographer and the Chief Cashier of the Great Western Railway. Owen worked with paper negatives, Ferrier with glass, using Niépce de St Victor's albumen process. The France-domiciled English photographer Robert Bingham printed the photographs used for the illustrations.

The idea of producing photographically illustrated presentation sets of the jury reports probably came from Prince Albert. Henry Cole noted in his diary in July 1851 that the "Prince [Albert] suggested that Talbotypes should be prepared to illustrate the report of the Jurors, and that 100 copies should be taken of each negative to be distributed to Public Libraries and foreign countries exhibiting." Subsequently, the Royal Commissioners decided at their meeting of 26 July 1851 to reserve £1,000 for "*Photographs of Articles exhibited, to be preserved as permanent memorials of the Exhibition*." At their next meeting, in August 1851, they formulated a letter to all foreign committees in which they mentioned the proposal of "transmitting to the Governments of their respective countries, through the Foreign-office, a complete set of the Medals and a copy of the Reports of the juries, illustrated by photographs of articles exhibited, in commemoration of the part taken by them in securing a representation at the Exhibition of the produce of their National Industries." The complete presentation set was to consist of the four mentioned volumes of the jury reports, three volumes of the *Official Descriptive and Illustrated Catalogue* (illustrated with engravings) and one volume of the *First* (and Second) *Report of The Commissioners for the Exhibition of 1851*.

By November 1851, William Henry Fox Talbot noted he had agreed with the Executive Committee, responsible for the production of the *Reports by the Juries,* that he would receive 15 copies of the presentation copies, of a value "roughly estimated at £30 per copy" in compensation for the printing not being contracted to Talbot and his former manservant, Nicolaas Henneman, who had set up a photographic establishment in London in 1847. Henneman was to be given "a present of £200 to compensate him for his trouble and disappointment." A list of 122 governments and institutions and individuals who were to receive complimentary copies was agreed and recorded in the minutes of the 52nd meeting of the Royal Commissioners in March 1852.

The production of the photographically illustrated copies of Reports by the Juries represented a monumental logistical challenge the like of which had not been previously attempted. Over 20,000 photographs would need to be individually printed at an average of 80 per day—using daylight—and then mounted. In the event, many of the photographs were printed in Versailles, where Robert Bingham had set up a printing establishment for this purpose. Bingham had the negatives on loan from the Royal Commission. When the project was finished in 1853, he was obliged to send them back to England because the time allowed by the French customs to keep them in France had expired. Captain Henry Charles Cunliffe Owen of the Royal Engineers was a key player in the organisation of the production of the presentation copies and in April 1852 he contacted the British Museum to advise on the mounting of the photographs on paper supports. According to Edgar Bowring, secretary of the Royal Commission, Captain Owen did not contend himself with any inferior execution and workmanship and was therefore largely responsible for the excellent condition of the presentation copies which made them a "handsome & highly finished present."

From the illustrations lists, printed in the volumes, it can be derived that jury reports were intended to have 154 photographs. However, the number of images in individual copies varies. A survey of the subject matter of the photographs in the *Reports* is revealing. Over fifty are of free-standing pieces of sculpture exhibited within the Crystal Palace thus giving a disproportionate perspective, considering the thirty classes of the exhibits and the exhibition's overall character. However, sculpture figured prominently in the exhibition, being placed at eye-catching spots in the Crystal Palace. These objects, like August Kiss' *Amazon* and Hiram Powers' *Greek Slave*, proved to be very popular with the public and were given much attention in other publications. Sculpture also made good subjects for the photographers who could show off their ability with interesting compositions and dramatic lightening. There are around ten general views of the building and the remainder of photographs document individual exhibits, including a view of Prince Albert's model house for families—subsequently rebuilt in Kennington, south London. In the process, the Royal Engineers were given the task of gaining permission from the exhibitors to

have their objects and goods photographed, using a special form.

The allocation and geographic distribution of copies is significant. Some 50 copies were presented to British individuals associated with the Great Exhibition; Royal Commissioners, members of the Executive Committee and seven officers of the Royal Engineers who had been key players in the organisational operations. Some British institutions, such as the British Museum, the School of Design and the Society of Arts received copies as did the 'national' libraries in Dublin and Edinburgh. Some parts of the British Empire were favoured with copies; Malta, the 'Cape of Good Hope,' 'Barbadoes' [sic], Trinidad, British Guiana, Canada, Nova Scotia, New South Wales and New Zealand. It seems that nine Indian Maharajahs and rulers received copies presented directly by the East India Company.

The remainder of presentation copies were presented to foreign governments. Some 'countries' fared better than others. In 1851 Germany was made up of a confederation consisting of thirty-eight sovereign states and four free cities. Twenty-seven of these were listed to receive presentation copies, probably reflecting the connections of Prince Albert with the country of his birth and his close interest (if not direct involvement) in the creation of the photographically illustrated copies of the *Reports.*

The presentation sets were produced by a joint venture of Spicer Brothers, a mayor wholesale paper company in London, and the printing firm of William Clowes and Sons. Together they had been responsible for all the official printed matter for the Great Exhibition. The volumes were bound by Robert Rivière, one of the foremost bookbinders in London. The production and the distribution of the presentation copies points to a significant period of elapsed between the decision by the Royal Commissioners in January 1852 as to who would be presented with copies and their actual delivery. This delay was partly caused by a fire at the printers, which destroyed the complete production of the printed texts. The first copies were ready in January 1853 and 44 copies were dispatched the following March. However, Talbot received his 15 copies in April 1854.

A full evaluation of the impact of the photographically illustrated copies of the *Reports by the Juries* has yet to be undertaken and the location of all extant copies is as yet unknown.

Anthony Hamber and Saskia Asser

See also: Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); Daguerreotype; Beard, Richard; Mayall, John Jabez Edwin; Kilburn, William Edward and Douglas T.; Delamotte, Philip Henry; and Talbot, William Henry Fox.

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EXHIBITIONS OF PHOTOGRAPHY

Nineteenth century exhibitions of photography were held by a wide range of groups, from national governments, mechanics' institutes, and museums to commercial studios and amateur photographic societies. The purposes and audiences for photographic exhibitions were similarly diverse. Exhibitions were used to promote the political and economic interests of imperial nations, to entertain and educate the public, to publicize commercial studios, and to promote the practice of photography as an art form, among other reasons. Exhibitions of photography had an impact on social conventions and cultural practices and, at the same time, ideas about photography were shaped by exhibitions.

World's Fairs, also known as Great Exhibitions and Expositions Universelles, were the largest of the early major venues for the public circulation of photography. These international exhibitions were celebrations of industrial production and imperial expansion, where the products of industrial nations were displayed to mass audiences. While the first exclusively photographic exhibition was held at the Society of Arts in December 1852, photography was included in the first Great Exhibition at London's Crystal Palace in 1851. Included major contributions of from Britain, France, Germany, and the United States. Commercial photographers, who exhibited work that promoted their studios, showed portraits, genre scenes, city views, and landscapes. At the 1876 Philadelphia Centennial Exhibition, photography and related goods were displayed together in their own building for the first time. However, at all of the international exhibitions, photographers also submitted contributions to other sections. For example, photographs of anthropological specimens and racial types were part of colonial exhibits, and photographs of public works projects, historic monuments, and urban views were shown in national displays. International exhibitions were spectacular events that were designed to entertain and educate the public, and they played a significant role in popularizing photography.

Mechanics' institutes were among the earliest venues for exhibiting photography in Britain and the United States. These institutes were commercial organiza-

tions that aimed to educate working-class men and to improve the quality of consumer goods. Mechanics' institutes held annual fairs where commercial goods and new technologies were exhibited together with the fine and decorative arts. Photographs were often exhibited alongside photographic equipment and new technology, but they were ranked among the fine arts in the system of awards. Portraits, an important source of income for commercial studios, were the most common subject matter of the photographs shown at these industrial fairs. Prizes were awarded and photographers often used awards to promote their businesses. Although smaller in scale than the international variety, these exhibitions were aimed at a similar, popular audience.

Photographs were also exhibited in the waiting rooms of commercial studios. During the early decades of photography, these displays were an essential part of creating a theatrical atmosphere that drew clients in to the illusion that photography was a mysterious and magical process. These informal exhibits were used to sell the work of the studio, but they also helped to establish an aesthetic environment by aligning photography with art. For instance, from the 1860s, Montreal-based photographer William Notman displayed photographs, along with paintings, drawings, and sculpture by local artists, in the reception area of his studio.

In the nineteenth century, photography was generally not shown in art galleries, but it was collected and displayed by museums concerned with design and industrial products. Henry Cole, the founder of the Museum of Ornamental Art in London (1852), which later became the South Kensington Museum (1856), and still later, the Victoria and Albert Museum (1899), began collecting and exhibiting art photographs in the late 1850s. Cole collected work by photographers such as Roger Fenton and Julia Margaret Cameron for its artistic merit, while studies, such as Eadweard Muybridge's photographs of animal locomotion, were valued as aids for artists. In the 1850s, proposals were put forth in Paris and Berlin for museums of photography, where reproductions of works of art from major collections, such as the Louvre, could be shown. Although these plans did not come to fruition, photography was used to reproduce works of art in museum collections. In the United States, the Smithsonian Institution began collecting and exhibiting photography in the 1870s as part of its Department of Graphic Arts. Like the South Kensington Museum, the Smithsonian attempted to educate visitors with its displays.

Exhibitions by photographic societies were important in the struggle to have photography accepted as a fine art. In the 1850s, photographic societies, such as the Photographic Society of London and the Société française de photographie, held small exhibitions of their work. At first, they followed the conventions of academic salons, with images hung from floor to ceiling, but this method proved impractical for viewing the fine detail and subtle tones that were valued by the photographers. In the 1890s, when photographers broke away from traditional photographic societies and formed new art-focused groups like the Linked Ring, the Photo-Club de Paris, and the Photo-Secession, new spaces for the exhibition of photography and new modes of display emerged. The Linked Ring salons in London from 1893–1909 were extremely prestigious, and a jury selected the best work from an international group of photographers. Here, photographs were framed in an increasingly uniform way with lighter frames, and there was more focus on individual photographs. Collectors could purchase the work, and reviews of the shows were published in photographic journals. In 1893, the Japan Photographic Society held its first *Foreign Photography Exhibition* in Tokyo, and the pictorialist work from abroad delighted amateur and professional photographers. This show encouraged photographers in Japan to experiment with new directions in art photography and to develop a Japanese pictorial style. The Philadelphia Photographic Salons, held in 1898–1901 were the first American salons equivalent to their European counterparts, as well as the first American photography exhibitions held in an art institution, the Pennsylvania Academy of Fine Arts. Many of the original members of the New York-based Photo-Secession exhibited and met at these influential salons.

During the nineteenth century, the social and cultural value of photography was negotiated through exhibitions. While, in its early years, photography was exhibited as a product of industry, towards the end of the nineteenth century, it became increasingly common to display photographs as works of art.

SARAH BASSNETT

See also: Expositions Universelle, Paris (1854, 1855, 1867 etc.); Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); and Société française de photographie.

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EXPEDITION PHOTOGRAPHY

As an activity both enabling and symbolizing the advance of modern industrial economies, expeditionary enterprise in the nineteenth century was based upon a new empirical quest for knowledge and a political will to establish civil order and authority according to Western ideologies. An expedition might seek places that few had previously probed to any great extent within the geographical neighborhood of the expeditionary party's own place of origin. With respect to expeditionary photography, Auguste-Rosalie Bisson's successful ascent of Mont Blanc in 1862 is a good instance of a physically challenging goal relatively close to home. In the nineteenth-century sense of the term, however, expeditions usually entailed a journey by one or more individuals to explore a region or to reach a destination generally at some remove from Western metropolitan centers and their cultural and social extensions in cities and towns in other lands. This essay examines the emergence and development of photography as an agent of visual documentation that became integral to exploration or expeditionary activities largely associated with notions of progress, nationalism, and imperial design. Because photography was a practice adopted by inhabitants of other regions penetrated by the often unwelcome advances of Western society, an additional study outside the scope of the present discussion might examine photographers of non-European ancestry who undertook journeys of importance to their own cultures.

By the late eighteenth and early nineteenth centuries, overland journeys and sea voyages involving extensive exploration had begun to accord a place to artists. Two instances are the British painter William Hodges on James Cook's second voyage to the South Pacific (1772–75), and the Frenchman Dominique Vivant-Denon, for whom it was "imperative to describe everything," while depicting antiquities and terrain under Bonaparte on his Egyptian campaign (1798–1801). Both of these cases established a lineage of scientific and scholarly pursuits on the one hand, and exploits of strategic political concern on the other. They illustrate the scope of expeditionary work, which could take the intrepid traveler over expanses of land and water to regions whose geographical and physical character had been only poorly known at best. The apparatus of support might be private, or sanctioned by governmental authority, or a collective venture with a combination of both. As such, expeditions must necessarily be understood to have multiple functions; because they were costly and fraught with risk, explorers needed to demonstrate the value of their journeys to their sponsors back home. Reports and journals recording the encounters of the expedition became common by the 1830s, together with hand drawn delineations of places and their inhabitants, geological formations, fauna, and flora.

Despite difficulties in obtaining successful results in the field in its first decade or so, early adherents of photography recognized its implications as an astounding new form of visual documentation more exacting in its faithfulness to the subject compared to conventional practices. By 1841, in the spirit of Denon's delineations of Egypt, a transitional work appeared by the architect and Egyptologist Hector Horeau, *Panorama d'Égypte et de Nubie*, with aquatints after Pierre-Gustave Joly de Lotbinière's daguerreotypes made in Egypt. (Joly de Lotbinière also contributed to Lerebour's, *Excursions Daguerriennes*.) Photographers would henceforth push into areas considered exotic and that, although still given liberal interpretation by Romantically inclined painters, would undergo increased scrutiny through the lens of the camera.

Maxime du Camp had realized the implications of producing photographs of environments rich with associative and historic significance when in 1850 he traveled with the writer Gustave Flaubert to Egypt and the Middle East. Du Camp had received an official commission from the French government, privileging him to access the lands of the Pharaonic dynasties, which resulted in over 200 negatives. These comprise images of monumental Egyptian sculpture and edifices with a clarity and perceived quality of scientific observation that signal a new aesthetic of exploration relative to prior modes of depiction. Du Camp's research also revealed an ethnographic interest in his representations of Arab culture, and an indication of the psychological and social complexity of encounter symbolized in the photographs of the people. Several indications of future directions are thus present in Du Camp's achievement: he contributed to the initial stages of a cumulative photographic archive important for geopolitical, scientific, and scholarly study; helped to rationalize France's geopolitical presence in the Orient, and hence reinforce its nationalistic identity as an industrial power; and assisted in popularizing Egypt in the European imagination

through various publications that included Du Camp's pictures. One of these was *Egypt, Nubie, Palestine, & Syrie*, published in 1852 by the printing establishment of Blanquart-Evrard. In short, Du Camp and others such as Félix Teynard, John B. Greene, and later Francis Frith contributed to a growing ethos in Western culture, in which entrepreneurship united with the acquisition of visual knowledge to entertain as well as to inform a fascinated public.

Photography was adopted in the following decade as an important agent in civil and military exploration and reconnaissance. This could be a matter of either individual initiative or team effort. Officers in the British administrative, medical, and military establishment in India were encouraged to use the camera as early as 1856. Two of the earliest known cases of photographic expeditions in the Indian Himalayas were solitary missions by an army engineer, Captain Melville Clark, and a deputy commissioner, Philip Henry Egerton. Their explorations of 1861 and 1863, respectively, resulted in singular publications that augmented the conventionally produced pictorial records of previous explorations in the Himalayas while offering the novelty of authenticity associated with photographic documentation. Clarke's *From Simla through Ladac and Cashmere* (1862) provides a glimpse of the terrain and the types of habitations encountered on his journey, from the higher arid regions with their Tibetan settlements—where the photographer engineer makes clear his astonishment that anyone could dwell in such "desolate country"—to the more hospitable Srinagar, the former Mughal summer capital in the Kashmir valley. Egerton's photographs and accompanying narrative in his *Journal of a Tour Through Spiti, to the Frontier of Chinese Thibet* (1864) indicates the author's interest in geology and ethnography, and is also explicit in proclaiming his confidence in English commerce and civilizing mission.

Photography's contribution to nationalist interests and imperial designs can be easily overstated, but its deployment as an instrument in tactical missions to remote areas leaves little doubt that such motives were at work. The Abyssinia Campaign of 1867–8 yielded upwards of 1500 photographs produced by specially trained Royal Engineers. The venture is important for understanding the politics of science as a facet of Britain's imperialistic project during the age of Victoria. Sir Roderick Murchison, President of the Royal Geographical Society, who had already initiated David Livingston's Zambezi Expedition of 1858–64, once again wielded his formidable authority by making certain that the scientific community would benefit from geographic knowledge acquired by the expeditionary party that was sent ostensibly to gather military intelligence and seek stability in the region. As it had for the Zambezi Expedition, photography proved a significant validation of Murchison's geographical and strategic concerns in support of empire.

The study of photography's place in the exploration of the American West in the years following the Civil War offers further opportunity to study the sometimes conflicting agendas of scientific and utilitarian enterprise. George M. Wheeler, a first Lieutenant in the Army Corp of Engineers, spearheaded the US Geographic Surveys West of the One Hundredth Meridian. Wheeler had the Army's support based on his ultimate (but unrealized) objective to produce a comprehensive engineering map of the Western Territories. Nonetheless, he engaged the services of scientific and other non-military personnel on his campaigns beginning in 1871, including the photographers Timothy O'Sullivan and William Bell. Beginning in 1869, with government sponsorship, Ferdinand V. Hayden led the US Geological and Geographical Survey of the Territories, in which the civilian scientist and his associates pushed into Colorado, Wyoming, Utah, New Mexico, Idaho, and Montana to survey and ascertain the natural resources of these vast expanses. Hayden, however, well exceeded the practical objectives mandated by the latter with his overriding concerns for the scientific and social value of his explorations. Here the significance of photography was understood through the prolific work of William Henry Jackson, which, together with the art of Thomas Moran, were able to convey better than words to the public and a skeptical Congress the incredible beauty and fantastic features of places like the geologically dynamic Yellowstone region. The concept of wilderness, seemingly limitless, yet perceived as fragile and subject to radical change through future settlement was brought home through Hayden's efforts and the witness of images, leading to the establishment of Yellowstone National Park in 1872, the first in the U.S. national park system.

A critical facet of the production of photographs during such arduous journeys was the photographer's subjective achievement in the act of exploration, discovery (or re-discovery), and successful securing of images under the duress of environmental extremes. A well-outfitted party might have twenty porters or more to transport supplies and equipment, depending on the planned duration of the expedition. The exploration of desert and mountain wilderness areas made trekking with the camera particularly challenging, not only owing to dramatic changes in climate and altitude and the uncertainty of route conditions, but also because the labors of making photographs on the spot demanded a physical constitution and agility well beyond the skills of most practitioners. The degree to which expeditionary photographers would push themselves and their entourage to get the view is astonishing, particularly in cases where the operator either was the very man responsible for taking the lead or else given license to

venture out from the main group. This is driven home particularly well where one has occasion to read the written accounts of intrepid artists like Samuel Bourne, Timothy O'Sullivan, or William Bradford. Each in his own way was able to successfully capture the essence of a personal encounter with the wilderness, though with larger implications for study: Bourne on his three Himalayan Expeditions in the 1860s; O'Sullivan on his campaigns with Clarence King in the American Great Basin in the late 1860s and early 1870s; and the painter Bradford in the Arctic region and Greenland in 1869 with the photographers John L. Dunmore and George Critcherson. In Bradford's case, for instance, the iceberg was the chief feature that epitomized his experience, and photography became the enabling medium for this as clearly evident in passages from his account of the expedition in *The Arctic Regions* (1873): "The wild, rugged shapes, indescribable and ever-changing, baffle all description, and nothing can do them justice but the sun-given powers of the camera" (Bradford, 49).

Although the "conquest" of the terrain by the photographer is implicit in the image appearing before the viewer, the implications run much deeper than is evident in a single image. First, any immediate aesthetic regard related to the aging Romantic standards of the picturesque and sublime must be tempered by the knowledge of photography's transcriptional powers, of almost magical character to nineteenth-century observers and to the artists themselves. The attainment of geophysical locations remote in space and time was authenticated by their appearance in the pictures, but the representations themselves corresponded to shifting sensibilities toward the empirical: raw attributes of rocks, fissures, fossils, glaciers, ice caves, and the like paralleled scientific directions that placed high importance of the gathering of firsthand evidence in the field. Moreover, the experience was greatly augmented by the systematic effort of a number of photographers to produce multiple interrelated views at a specific location, including panoramas and sequenced pictures, to better represent the space-time continuum of place through careful study and imaginative reflection. The peoples encountered on these voyages were also assigned to a text and image realm, frequently integrated into ethnographic studies as a representation of disappearing cultures only too readily taken as part of the aesthetic experience. Thus, expeditionary photography, beyond matters of taste and the pleasure of looking, engaged the cultural and political dynamics of the age.

GARY D. SAMPSON

See also: Bell, William H.; Bisson, Louis-Auguste and Auguste-Rosalie; Blanquart-Evrard, Louis-Désiré; Bourne, Samuel; Du Camp, Maxime; Egerton, Philp H.; Frith & Co; Greene, John B.; Jackson, William Henry; O'Sullivan, Timothy H.; Teynard, Félix; Geology; Survey Photography; and Travel Photography.

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EXPOSITIONS UNIVERSELLE, PARIS (1854, 1855, 1867 etc.)

The Paris Expositions Universelles and the other world's fairs of the nineteenth century were curious and spectacular cultural events. Sponsored by the host country's government, they were well-orchestrated public relations campaigns as well. These exhibitions provided the ideal forum for the host country to promote its notions of progress, nationalism, imperialism, unity, education, culture, entertainment, and commerce. They also served as some of the largest and earliest public venues for the exhibition of photography. Thus, the Expositions Universelles of 1855 and 1867 are rich points for study of particular moments in photographic history.

The first French exposition universelle was held in the center of Paris along the Champs Elysées from May 15 to November 15, 1855. It was also the first international event where art was shown together with industrial products, albeit in separate buildings—art in the Palais des Beaux-Arts and industrial products in the Palais de l'Industrie and its Annexe. Photography was exhibited in the industrial division, in the same building as steam engines, gloves, animal skins, lacework, ironwork, food,

and animal products, among other things. This classification made a strong statement about photography's accepted role and applications. It was clearly celebrated as one of the most important inventions of the nineteenth century with Louis Daguerre's name being carved on the façade of the Palais de l'Industrie along with other great men. Photography's status as an art form was, however, hotly debated.

Photography was categorized in the twenty-sixth industrial class, "Letter and Block Printing, Photography" and had its own subcategory which included both photographic equipment and photographs. The submissions were selected by each country's subcommission and were exhibited in different locations throughout the Palais de l'Industrie as the exhibition space was divided between the different countries. An element of competition was created by the fact that an International Jury awarded four levels of prizes (grand gold medal, the first class medal, the second class medal, and honorable mention.). Interestingly, half of the jury was French and the other half of the jury was comprised of members from foreign countries proportional to the number of exhibitors. Not surprisingly, French exhibitors greatly outnumbered any other country and made up the majority of the prize winners. Approximately 180 different photographers were represented at the 1855 Exposition Universelle; 92 of them were French. The others came from Britain, other European countries, the British colonies, the United States, and Turkey.

There was a great focus on the latest technical innovations in photography in the countries' exhibitions. The 1850s were a period of much experimentation and progress in the field with France and England leading the way. By 1855 daguerreotypes were losing popularity and paper photography, both colotypes and collodion, were seen as the wave of the future because of their reproductive capabilities as well as their non-reflective, easier to view surfaces. This trend was reflected in the entries at the Exposition Universelle.

The types of photographic works shown embodied popularly-held contemporary views of acceptable applications of photography. They can be divided into three broad categories: scientific and documentary aids, industrial and commercial applications, and artistic tools. In the scientific and documentary category, Dr. William Reade's photographs of the moon and William Sherlock's studies of clouds were touted in much of the Exposition Universelle commentary for their applications to astronomy and meteorology. Auguste Adophe Bertsch and Camille Arnaud's microscopic photography of insects, wood, and vegetable fibers were also highlighted. Dr. Hugh Diamond's photographs of mental patients' facial expressions were praised for their important applications to the study and care of mental illness. Louis Rousseau and F. Jacques Moulin reinforced the concept that photography could be used in the field of ethnography by showing images of Hottentot men and women who were seen as ethnological objects of fascination in the mid-nineteenth century. Works by photographers of the Mission Héliographique, a project sponsored by the French government to document the country's architectural patrimony were complimented as ideal examples of photography's documentary uses.

Photography was also celebrated for its industrial and commercial uses. Adolphe Braun was awarded a first class medal for his floral studies, which he used in his wallpaper and textile design business. Louis-Désiré Blanquart-Evard and A.A. Fockeday were praised for developing a technique that enabled them to produce infinite numbers of prints from the same negative, thus greatly affecting their illustrated book publishing business. A number of portraitists also exhibited at the Exposition Universelle, including André-Adolphe-Eugène Disdèri, Nadar, and Mayer and Pierson. Photography offered an inexpensive alternative to the oil-painted portrait, affording a much larger portion of the population the opportunity to have a portrait made.

Photography's application as a study tool for artists was widely supported in the 1850s. Examples by photographers such as Gustave Le Gray, André Giroux, Henri Le Secqq, and John Dillwyn Llewelyn of reproductions of works of art as well as portraits and landscapes which could be used by artists as an aid in their painting and sculpture were also exhibited.

While the focus at the 1855 Exposition Universelle was on the marvels of the technology itself and photography's role and function as an important tool in a range of fields, there was a strong undercurrent in the exhibition's reviews, reports, and other commentary that also discussed photography's status as an art form in its own right. Many of the same works discussed above for their applications in the various fields were also promoted by some critics for their aesthetic merits. Similarly, a contingent of critics expressed great disappointment in the fact that photography was relegated to the Palais de l'Industrie rather than the Palais des Beaux-Arts, a position which would have granted it more recognition as an art form. While opponents of photography's artistic qualities focused on the mechanical elements, proponents emphasized the degree of choice and creativity involved in composing a photograph from the angle, to the lighting, to the framing. On a side note, there was also a great aesthetic debate in the 1850s which found its way into Exposition Universelle commentary surrounding the retouching of photograph. Many saw retouching as deterring from an image's veracity and sincerity.

The next exposition universelle to be held on French soil was thirteen years later from April 1 to October 31, 1867. In the intervening years, photography had made significant technical advances and had exploded in

popularity with studios going up everywhere, extending further throughout the world. At the same time, photography still had not been fully recognized as an art form. Though photography was accepted into the 1859 Salon, it was isolated from the other artistic media, which were exhibited concurrently in the same building. The photography component, which was officially the third exhibition of the Société française de photographie, could only be accessed through a separate entrance. It was comprised solely of photographs; there was no equipment. The two exhibitions had their own catalogues which were similar in format, but neither mentioned the other exhibition.

The 1867 Exposition Universelle embodied the general consensus on the status of photography in the 1860s. It was held again in the center of Paris on the Champs-du-Mars between the Quay d'Orsay and the Ecole Militaire. This time the fine arts and industry were housed in the same main Palais which was surrounded by many smaller exhibition buildings that formed an exposition park. Photography was placed in Classe 9, "Material and Application of the Liberal Arts" in its own section, "Photographic Prints and Equipment." Physically and psychologically, photography held a position somewhere between art and industry. The exhibition space was again divided by country, but all photography exhibits were located along the same gridded ring in the Palais making it easier to compare the different countries' submissions. Over 650 exhibitors showed in this category. The majority was French and British, with other entries from numerous European countries, Russia, the United States, Canada, Algeria, and Turkey. The photographs shown were generally similar in type to those found at the 1855 Exposition Universelle. Some of the new types included equestrian portraits, geographic views, images of China, and greatly enlarged panoramic photographs. Many of the same photographers who had also exhibited in 1855 exhibited or participated as jurors in 1867.

Much of the 1867 commentary highlighted the technical achievements. There was great concern about the vulnerability of photographs and a strong desire to increase their longevity. New carbon techniques which promised permanency were exhibited. The Woodburytype was seen as another important technical development. Other photographers were experimenting with diverse materials and uses for photography including: miniatures that could be used for jewelry, photographs on enamel, and portraits on porcelain. The firm Geymet and Alker was developing new, more portable equipment that could be used by the "tourist photographer." A Mr. Johnson from the United States exhibited a panotoscopic camera that could be used for groups and landscapes at a great range as well as to better capture skies and clouds.

The photography exhibitions at the 1855 and 1867 Expositions Universelles brought photography to the attention of a public that was larger and geographically more far reaching than ever before. They promoted a fairly broad range of photography's potential applications and also served as a forum for the ongoing nineteenth-century debate over its status as an art form.

CAROLYN PETER

See also: Daguerreotype; Calotype and Talbotype; Wet Collodion Negative; Sherlock, William; Diamond, Hugh Welch; Rousseau, Louis; Moulin, Félix-Jacques-Antoine; Mission Héliographique; Braun, Adolphe; Blanquart-Evard, Louis-Désiré; Disdéri, André-Adolphe-Eugène, Nadar (Gaspard-Félix Tournachon); Le Gray, Gustave; Giroux, André, Le Secq, Henri; Llewelyn, John Dillwyn; Société française de photographie; and Woodburytype, Woodburygravure.

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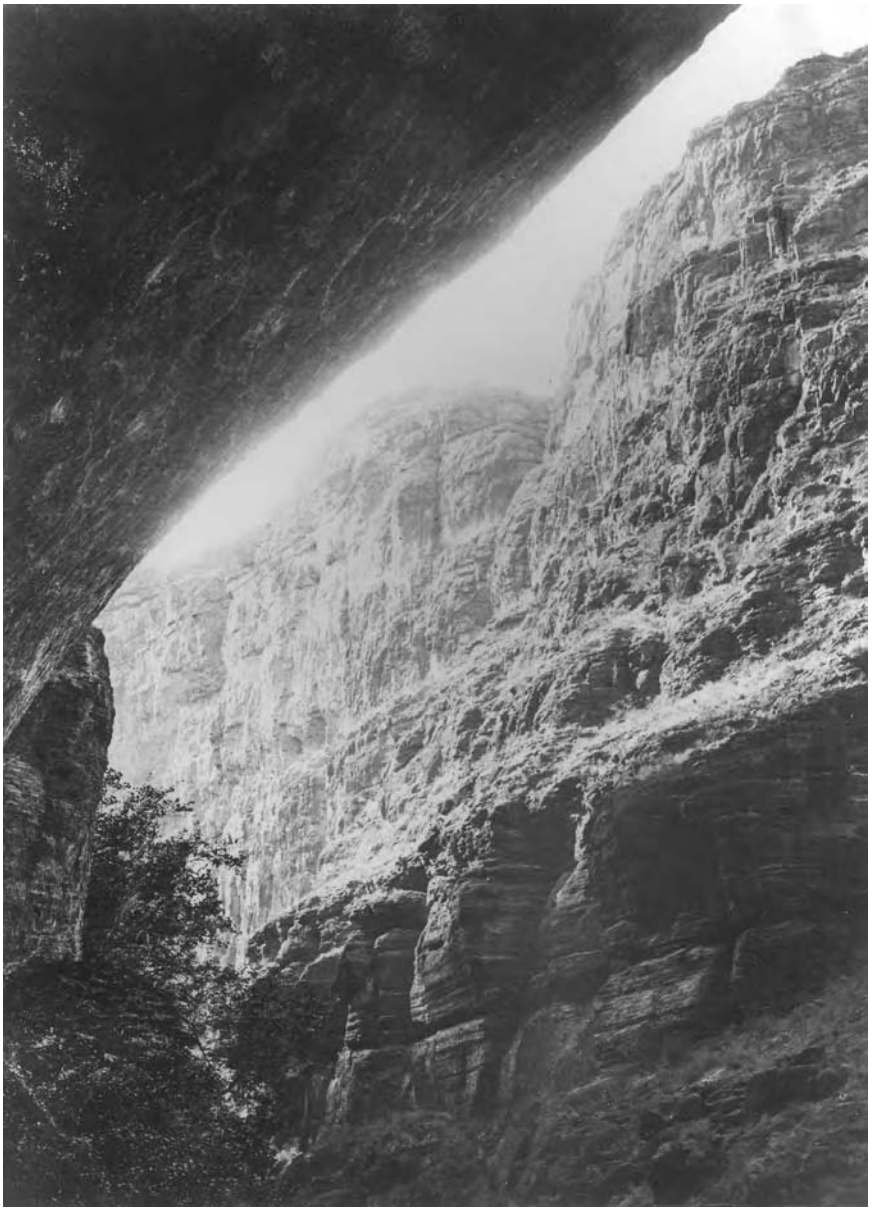
EXPOSURE

In photography, common understanding of the term "exposure" suggests simply exposing a film, plate or paper to light. More scientifically, it can be defined as the effect produced on a sensitised material by light, which is proportional to the product of intensity and time. Correct exposure depends on four variable factors; the quantity of light, the nature of the subject, the aperture of the lens, and the sensitivity or 'speed' of the negative material.

Long exposure times severely limited the scope of the photographic pioneers. The first process used successfully to produce a permanent image, the heliographic process of Joseph Nicéphore Niépce, required an exposure time of several hours and was therefore of very limited potential. The first practicable processes, the daguerreotype process of L.J.M. Daguerre and W.H.F. Talbot's photogenic drawing, both announced in 1839, required shorter exposures but still long enough to severely limit the photographer's subject. The earliest daguerreotypes requiring minimum exposures of five minutes and often up to thirty, depict almost exclusively, static landscapes, architectural views and still life subjects. The subject matter of Talbot's surviving photogenic drawings is even more limited. Most are *shadowgraphs*, as Talbot described them or what we would call photograms today. Surviving camera pictures are rarer and again show static subjects. Exposure times were probably a little longer than contemporary daguerreotypes. In *The Pencil of Nature* (1845–46),



Bell, William Abraham. Canyon of Kanab Wash, Looking South. *The Metropolitan Museum of Art, Gilman Collection, Purchase, The Horace W. Goldsmith Foundation Gift [2005 2005.100.585 (10)] Image © The Metropolitan Museum of Art.*

Talbot claimed that he produced camera pictures in ten minutes "during the brilliant summer of 1835." On the other hand, his notebook of 14 August 1839 records "… a picture made by the camera in an hour, on a dark day." Exposure times of both processes were reduced, particularly by improvements in the chemistry of the sensitive materials. In 1840 John Goddard in England found that Bromine vapour increased the sensitivity of daguerreotype plates. The same year Talbot discovered that gallic acid added to silver nitrate produced a latent image after a brief exposure, which became visible on development. The consequences were dramatic. With exposure times reduced to a few minutes, the exciting prospect of photographing living people became reality. By the end of 1840 it became evident that commercial portrait photography could be achieved using either process and the first studios opened a year later. However, exposure times still limited the photographer's craft. The streets of Talbot's London calotypes (c 1845) are peopled by ghosts or eerily empty because the exposures of two or three minutes were too long to capture the city bustle.

In 1851 Frederick Scott Archer introduced the wet collodion process, an innovation which combined some of the best elements of the pioneer processes and reduced exposure times to a few seconds. Wet collodion soon superseded both earlier processes and promoted an explosion of popular interest in photography. A wider range of subjects became possible, yet the length of exposure still imposed limitations. Victorian portraits usually show solemn faced sitters because it was difficult for them to smile naturally for several seconds. Action shots remained problematic, most movement being recorded as a blur. Thus, Roger Fenton**'s** Crimean War photographs (1855) often have the appearance of empty stage sets. Tripods were essential to keep the camera steady and exposure technique remained primitive, involving removing the lens cap for a period measured by counting or timing with a watch. Photographers made life more difficult for themselves by failing to deal systematically with the known factors that affected exposure. The attitude of William Lake Price in his *Manual of Photographic Manipulation* (second edition 1868) was typical. "No fixed data can be given for duration of exposure,… Still, by practice, a sort of instinct grows on the photographer,…" Using specialised apparatus and techniques, photographers such as Thomas Skaife, Thomas Sutton and George Washington Wilson, did manage to reduce exposure times to fractions of a second and capture small but sharp images of moving subjects. Lenses of large aperture and short focal length were essential, as was ideal light and careful processing. Even so, as William England recorded in *The Photographic News* (April 11, 1862), to produce these so-called `instantaneous' photographs "a very large amount of patience is necessary, and failures are very plentiful."

All this finally changed in the 1870s with the introduction of the fast gelatine halide dry plates that readily allowed exposures of fractions of a second. The technological spin-off was enormous. Shutters became an essential adjunct to the camera, which themselves became smaller and could be held in the hand. Exposure meters first began to be widely marketed in the late 1880s. The development of new artificial light sources was stimulated. Roll film became practicable and with it moving pictures and the cinema. At last, photography in a wide range of situations, night or day, was simplified, action could be recorded and John Herschel**'s** 1860 dream of 'snapshot' photography became a reality.

Suddenly a new world was opened to photographers. New insights into the natural world were provided by the motion studies of Muybridge and Marey. Unposed pictures taken without the subject's knowledge became possible for almost the first time and Paul Martin**'s** street life photographs of the 1890s are a landmark of the period. The rapid growth of a new amateur market and the loosening of photography's ties with the graphic arts brought a fresh stimulus to the debate about photography's role as an art form. One of the most influential photographers to exploit the new technology, P.H. Emerson**,** wrote passionately on the debate in his book, *Naturalistic Photography* (1889).

The widespread introduction of the gelatine dry plate and its consequences marks the beginning of modern photography. During the twentieth century, steady improvements in equipment and sensitive materials contributed to further small reductions in exposure times. Nevertheless, improvements in the twentieth century were small and incremental compared to the great strides made at the end of the nineteenth. Determining optimum exposure times continues to be a key factor in making good photographs today but current practice and style is largely made possible by technological developments made a century earlier.

JOHN WARD

See also: Niépce, Joseph Nicéphore; Daguerreotype; Daguerre, Louis-Jacques-Mandé; Talbot, William Henry Fox; Latent Image; Calotype and Talbotype; Archer, Frederick Scott; Wet Collodion Negative; Wet Collodion Positive Processes; Fenton, Roger; Price, William Lake; Skaife, Thomas; Sutton, Thomas; Wilson, George Washington; England, William; Camera Accessories (Shutters, Tripods, Plate-Holders etc.); Actinometers and Exposure Measurement; Herschel, Sir John Frederick William; Muybridge, Eadweard James (Edward Muggeridge); Marey, Etienne Jules; Martin, Paul Augustus; and Emerson, Peter Henry.

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EYNARD, JEAN-GABRIEL (1775–1863)

Born in 1775 in France, Eynard fled to Switzerland in 1793 to escape the excesses of the French Revolution. An illustrious career as a merchant, international financier, and diplomat ensued, enabling him to amass a large fortune, much of which he devoted in the 1820s to helping Greece win its independence.

Eynard was sixty-three when the invention of the daguerreotype was announced in 1839. He exercised his prodigious energy to learning the process, and in 1842 made eight daguerreotypes of the French king, Louis-Philippe, and his family, images now seemingly lost.

Free from financial constraints, Eynard chose his subjects at will. Not surprisingly, he drew from the life immediately around him: his family, friends, servants, houses, carriages, the city of Geneva, and the stage sets of his private theater. He selected his settings, arranged the poses, and, with the help of his valet, Jean Rion, included himself in many images. These carefully composed, technically accomplished, and elegant documentations of Eynard's life collectively comprise, in effect, an extended family album at once both sophisticated and artful.

As they were made for private delectation and were not subject to the vicissitudes of the market place until well after his death in 1863, a surprisingly large number of his daguerreotypes have survived.

GORDON BALDWIN

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FALLOWFIELD, JONATHAN (1856–2005)

English chemist and photographic chemical supplier

Jonathan Fallowfield was born in 1835 and established himself as a chemist. By 1856 he was advertising as a 'photographic chemical and material warehouse.' From the early 1870s the business primarily sold cameras and photographic materials for use with the wet-collodion and, later, dry plate processes offering professional and studio equipment such as portrait cameras and carte-de-visite lenses. In 1885 the Fallowfield premises and business was valued at £18,000. Jonathan Fallowfield had a reputation for hard work and he recalled that during one period of twenty-four years he only took one week's holiday. He died in London on 23 February 1920 leaving an estate of £51,360 13s 7d.

In 1888 the business was purchased by F W Hindley (1856–1925) who significantly expanded its retail activities and in 1890 the business moved to 146 Charing Cross Road, London, where it remained until 1923. From the early 1890s the firm expanded the range of equipment offered by it and commissioned products which it retailed under its own name, most significantly the Facile camera patented by Frank Miall in 1889, which was produced in several models until the end of the 1890s. It is unlikely that it undertook any extensive manufacturing on it's own account.

After the 1919 the firm concentrated on retailing equipment made by the major equipment and sensitised materials manufacturers and its own brand cameras and equipment disappeared. Jonathan Fallowfield became a limited company in 1921 and by the 1930s the firm had diversified into selling radio equipment. During the 1950s it began to concentrate on British wholesale and export orders only.

The company remained a wholesale photographic business becoming part Sangers Photographics Wholesale Ltd in 1987 and Sangers Ltd in 1996. The Fallowfield company exists in name only as part of Quadnetics Group plc.

MICHAEL PRITCHARD

FAMIN, CONSTANT ALEXANDRE (FRENCH, 1827–1888)

French photographer

Constant Alexandre Famin (sometimes confused with Charles Famin, a painter) was a French photographer who operated two studios in Paris (5, rue de Fleurus; 20, av. d'Orléans). Famin primarily photographed landscape and rural subjects, and was among the group of photographers to work in the forest of Fontainebleau and its environs in the late 1850s, 1860s, and 1870s. His rural photographs, and in particular his studies of peasants and farm animals, may have been intended as aids for painters, but even among these, Famin's eye for complex, intriguing composition and his sharply detailed prints distinguish his work from that of other photographers of rural life. He also appears to have made architectural photographs at Bourges and Paris. The bulk of Famin's known work is represented in the Bibliotheque Nationale, Paris, where, under the rule of the *Dépôt Légal,* he made two large deposits of his work in 1863 and 1874. Though he primarily produced albumen prints from collodion negatives, a group of stereoscopes deposited in 1859 at the Bibliothèque Nationale, Paris, under the name J. Tongue but now thought to be by Famin, suggests a greater diversity to his output than previously acknowledged.

SARAH KENNEL

FARADAY, MICHAEL (1791–1867)

Michael Faraday was closely associated with some of the most important pioneers of photography. He worked hard to improve Britain's glass production, especially important for large lenses. He also discovered phenomena related to the optical behavior of materials that became of use in the 20th century. He is, however, more remembered as the single person most responsible for the modern technology for the generation and management of electric power. He also made many contributions to chemistry. But his greatest importance for photography was arguably his work on the relation between electricity and magnetism. While this was fundamental to the generation of electric power it was also the basis on which James Clerk Maxwell (1831–1879) built his theory of electromagnetic waves, which explains much of the behavior of light and its relatives, radio waves, infrared, microwaves, ultraviolet, x-rays and gamma-rays.

Faraday was born to a father who was in trade as a blacksmith, and had a short term of formal education, which included essentially no mathematics. He apprenticed to a bookbinder at age 13 and became increasingly interested in chemistry and electricity. Eventually he was able to construct experimental equipment, based on what he had read, using extremely simple materials. By 1812 he had constructed, for example, a machine to generate static electricity and accumulate an electric charge, as well as a voltaic pile, what we would now call a battery.

In the winter of 1810–11 Faraday attended a series of public lectures on chemistry. He took careful notes, which he illustrated. He presented these to his employer, and not long after a patron of the store noticed them and took Faraday to a public lecture at the Royal Institution by its laboratory director, Sir Humphrey Davy (1778–1829), one of the most well known physicists of the time. Faraday was enthralled, and when his apprenticeship was up some months later he handed his notes of the talks to Davy and requested employment as Davy's assistant. Some months later Faraday was hired and began his career at the Royal Institution, his main affiliation until his death.

A year after Faraday was hired he accompanied Davy on a tour of major science laboratories on the Continent. Faraday met scientists in Germany, France and Italy, including Ampere, Humboldt, Gay-Lussac, and Volta, the inventor of the voltaic pile. The people he met he remained in contact with upon his return to the Royal Institution.

The Royal Institution was a learned society established in 1799 to promote organized research and disseminate new knowledge. The former goal was supported by the creation of a laboratory and a set of research professorships, and a major research library. The diffusion of knowledge was to be carried out both by courses offered by the research professors. Faraday founded a series of six talks at Christmas time for juveniles and carried them out himself for 19 years.

Faraday's work for the first several years was largely in chemistry. He performed analyses for Davy and published a number of short papers on them.

In 1820 Oersted, a Danish physicist discovered that an electric current flowing in a wire would orient a compass needle at right angles to the wire. Repeating Oersted's experiment re excited Faraday's interest in electricity and magnetism, one which he eventually became heavily involved with.

In 1821 Faraday married Sarah Barnard. He applied for and received an addition to his rooms in the Royal Institution. The couple occupied these rooms for the rest of his career.

The same year he showed that a magnetic needle could be made to rotate around a wire carrying an electric current. This is the principle of the electric motor, though it took some years for practical designs to follow, mostly because no source of large amounts of electric power existed. Such sources awaited Faraday's discovery of the electric generator idea a decade later.

In the years immediately following he performed mostly chemical experiments, including the 1825 discovery of Benzol, which later became the basis of a number of the aniline dyes, which still later came into use as photographic sensitizing dyes.

Faraday became involved with glass production in the following way. In the early 1800s the British had dominated the supply of high quality optical glass and the instruments, such as *camera obscuras*, telescopes and microscopes, made from it. But in the 1810s and twenties a new supplier, a young German named Fraunhofer, began to produce much better glass of considerably larger diameters, and through using the glass in large prisms discovered that the spectrum of the Sun was a rainbow crossed by dark lines at fixed colors (founding modern spectroscopy). These lines in turn he was able to use as high precision sign posts to measure the quality of his glass, and to give it precise specifications for his customers. Fraunhofer became the world leader in supplying large lenses and prisms.

This naturally concerned the British and the Joint Committee of the Board of Longitude and the Royal Society for the Improvement of Glass for Optical Purposes was established in 1824. It at first included a number of well-known physicists, such as Humphrey Davy, Thomas Young, and Sir John Herschel as well as lens maker George Dolland and glassmakers Pellat and Green were added. Faraday was engaged to do a chemical analysis of samples of Fraunhofer's glass. This he did and handed the derived compositions to the glassmakers, working on the assumption that this

piece of reverse engineering was the key to reproducing Fraunhofer's success. But their attempts to use these formulae repeatedly failed. It became evident that the conditions of manufacture, including the materials and shape of the melting pots, the temperature progression of the furnace, and the stirring techniques and materials were also important.

In 1825 a subcommittee of Dolland, Herschel, and Faraday was set up to closely supervise the glassmakers. In 1827 it was deemed necessary to move the furnace operations to the Royal Institution so that Faraday could supervise them directly. The results continued to be imperfect, yielding glass with bubbles and striae. It became clearer that the stirring technique was crucial to getting uniformity in the glass, but this goal eluded Faraday. The few successes Faraday achieved were not reproducible. In May 1830 he resigned the Committee. Fraunhofer had meanwhile died in 1826, and his secrets, known to former associates as well as some of his coworkers, were carried abroad. They were put to use in Switzerland and then in France. The expertise eventually found its way back to England that led to a revival of British optics.

In the 1820s Faraday noticed, while experimenting with a manganese-doped glass of purple color, that the glass turned darker if exposed to sunlight. It could turn lighter again if removed from the light. This must be one of the earliest descriptions of photochromic behavior, and is directly related to photography. He never tried to produce an image with this material, though he could have. A silver halide-doped glass with the same ability found practical application in darkening/clearing sunglasses in the late 20th century.

As mentioned above Faraday was a close associate and became a friend of Sir John Herschel, and likely through him got to know Henry Talbot. In 1839 when Talbot wished to describe his work on photographic images Faraday provided the first public announcement of his photogenic drawing process on the 25th of January before the Royal Institution. He gave the first talk on the details of the process (see the *Literary Gazette* of Feb. 2, 1839). Faraday supported Talbot in his admission to the Royal Society, but later opposed the granting to him of a baronetcy. Faraday connected to many others in the circle of early photographers and sat for a number of portraits, including one by Mayall.

Faraday had always thought that symmetry of action in physical phenomena was important and should apply to electricity and magnetism. He had demonstrated in 1821 the electric motor principle, as outlined above. He thought at the time that the reverse should work and that there should be a way for a changing magnetic force to cause an electric current to flow in a conductor. In 1831 he resumed his electrical experiments. He demonstrated that rotating a coil of wire between the poles of one or more magnets would induce an electric current to flow in the coil. This is the basis of the electric generator. With this discovery the modern age of electricity began.

In the 1840s and 50s Faraday taught chemistry and continued his electrical and optical researches. He discovered that magnetic fields could affect the properties of light both as it traveled in the vacuum and through matter. He demonstrated that strong magnetic fields could rotate the plane of polarization of polarized light as it traveled through glass placed between the poles of a large magnet (Faraday rotation"). This clearly hinted, based on the earlier discovery of the link between electricity and magnetism that light's nature was both electrical and magnetic.

In pondering the fact that electric charge and magnets could exert forces on things the charge and magnets do not touch (as is the case for matter and gravitational attraction), Faraday dropped the old term of action-at-a-distance, and began to speak of this influence as evidence for electric and magnetic "fields," existing in and influencing the properties of space. The magnetic field could easily be visualized by sprinkling iron filings on a sheet of paper under which was placed a magnet. This now common experiment, and a similar one that can map electric force, made it easy to speak of field lines or lines of force, with their own reality, more or less independent of their sources in electric charges and magnetic poles.

The magneto-optical phenomena demonstrated by Faraday and the field idea were picked up, elaborated and mathematized by Maxwell in the 1850s and 1860s into a self-consistent set of equations which described static electric charge, currents in the vacuum and in conductors, and the consequent electromagnetic fields generated by the latter sources. He showed that electric and magnetic fields could propagate each other as waves and derived the waves' speed of propagation from the known electrical properties of conductors and the vacuum, and showed that this speed was in agreement with the previous best measurements of the speed of light. This established the electromagnetic wave nature of light and allowed Maxwell to predict the existence of radio waves and the rest of the electromagnetic spectrum. This foundation to the electromagnetic wave theory of light is Faraday's single greatest contribution to traditional photography and the newer digital photography.

Faraday did experiments until 1855 and lectured until 1861. His health declined during that time and he died in 1867.

WILLIAM R. ALSCHULER

See also: Maxwell, James Clerk; Davy, Sir Humphry; Young, Thomas; and Herschel, Sir John Frederick William.

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FARDON, GEORGE ROBINSON (1807–1886)

American and Canadian photographer

Fardon was born in 1807 in Birmingham, England. No information is available about his ancestry or his early life there, nor when he emigrated to the United States. Internet genealogical Web sites suggest people bearing the name Fardon in the Birmingham area were Quakers. Fardon first appears in North America as a commission merchant at 42 Maiden Lane (*Daggett's New York City Directory*, 1848–49); he lived at 84 Greenwich Street. How or when he learned photography is not known. He appears to have been attracted to California by the 1849 gold rush. Although his arrival date in San Francisco is still a mystery, he was, judging by the photographs published in his *San Francisco Album* (1856), active by the mid-1850s. His Victoria obituary, which credits him with introducing the wet-plate process to San Francisco, possibly as early as 1852, also suggests he arrived in California in 1849. Fardon's reputation as a photographer in San Francisco rests upon his landscape and architectural views. According to Peter Palmquist and Thomas Kailbourn (2000, 223), this set him apart from his contemporaries. Some of Fardon's landscape images clearly depicted the photo studio facades of James May Ford and Robert H. Vance. Fardon, however, did not advertise as extensively as these contemporaries. There is even some evidence that he either learned photography from Ford or acquired some his San Francisco views (Palmquist and Kailbourn, 2000, 224, note 3).

Like many photographers in other urban settings hoping to boost their sales and promote their home, Fardon created a seven-part panorama of San Francisco in May 1855 (*Bancroft Library, University of California Berkeley* and *J. Paul Getty Museum, Los Angeles, California*; cited in Palmquist and Kailbourn, 2000, 224). During 1855 and into the early summer of 1856 he continued to produce striking photographs of the city's architecture from street level and elevated vantage points atop buildings and various hills. These photographs, including the seven-part panorama as separate images, were compiled into a book, *San Francisco Album: Photographs of the Most Beautiful Views and Public Buildings of San Francisco*. First advertised in September 1856 by Herre & Bauer (William Herre and John Bauer), this publication is considered the earliest work about an American city illustrated completely with photographs. Each copy was unique and contained between 30 and 33 salted-paper prints from wet-collodion negatives. Only nine copies are known to exist today (Fardon, 1999, 173). Marvin R. Nathan's catalogue raisonné of every extant San Francisco view by Fardon totals 65 (Fardon, 1999, 135–171). Some of Fardon's San Francisco landscape photographs, including a second panorama from around 1860, have not survived and are known only through artistic representations. Two examples are "The Merchants' Exchange, San Francisco, California," published in *Ballou's Pictorial Weekly* on May 23, 1857 (*Huntington Library, San Marino, California*; cited in Fardon, 1999, p. 118; this view may be based on a photograph, "Views in California" no. 8, *California Historical Society, San Francisco*), and "San Francisco in 1860" published by Hutchings & Rosenfield (*Bancroft Library, University of California Berkeley*; cited in Fardon, 1999, p. 115). Among the images in *San Francisco Album* is one depicting "Fort Vigilance," (also known as "Fort Gunnybags"), the Montgomery Block Building on Sacramento Street, with sandbags lining its front and guards on the rooftop. Fardon took at least two other photographs of this building which headquartered the Vigilance Committee: one view, taken May 22, 1856, depicts the moment after the lynching of two men accused of homicide, while the other is a side view of Sacramento Street from Front Street which also shows the fortifications erected by the Vigilance Committee. The lynching photograph is considered one of the earliest examples on the North American West Coast of photographic reporting (Fardon, 1999, 166). William Herre, one of Fardon's publishers, was a member of the 1856 Vigilance Committee.

Fardon competed in public exhibitions of his photographs at least three times in his career. The first two occasions were in San Francisco at an Industrial Exhibition sponsored by the Mechanics' Institute in 1857 and 1858. At the latter exhibit he was awarded a bronze medal for his nine patent leather photographs. These same photographs may have subsequently formed the centerpiece of his photographic display, which included other examples of studio and outdoor group portraiture, landscape and architectural views taken in Victoria, British colony of Vancouver Island, and shown at the 1862 London International Exhibition. Fardon was a member of the very large committee which oversaw the donation of materials for the exhibit. He did not win any prizes for his contribution. Frances George Claudet, his colleague in New Westminster, capital city of the neighbouring

colony of British Columbia, won honourable mention. The jury for the photographs included Claudet's father, Antoine-François-Jean Claudet.

Fardon did not remain in San Francisco very long and relocated to Victoria, the capital city of the British colony of Vancouver Island. The date of his move is still uncertain, but appears to have been in 1859 or 1860 at the latest. Evidence from one of his customer's diary and a copy of *San Francisco Album* owned by this same customer, James de Fremery, places him in San Francisco in early March 1859 and possibly as late as July 1859 or January 1860 (Fardon, 1999, 171). Evidence for Fardon's earlier physical presence in Victoria is provided by a receipt issued to Fardon on May 3, 1859 for a first installment payment on the purchase of two city lots at auction in Victoria. These lots, however, may have been bought on his behalf for his half-brother Alfred John Langley. Langley, himself having moved to Victoria from San Francisco in 1858, could also have purchased them for Fardon. One of these lots, Lot 1616 (southwest corner of Yates and Langley Streets), was rented on May 10, 1859 by Langley to two Victoria merchants who were also to construct a brick building on the lot. This building housed Fardon's studio in the late 1860s and early 1870s. Fardon sold the second lot, Lot 1617, on December 15, 1859 to his three half-brothers (A.J., James, and Charles Langley); the sales agreement does not provide a geographic location for either party. Fardon also owned a third lot, Lot 1620, in the same block on Langley Street, which he sold, along with Lot 1616, in May 1867 to A.J. Langley (Langley family papers, BC Archives, MS-0180, box 2, files 17 and 18; *Gazette* [Victoria], May 5, 1859, notice of sale of Lot 1616 and 1617 to "J.R. Fardon").

Although Fardon was a Victoria property owner on paper in 1859, he was not listed as a voter in the December 1, 1859 voters list, nor was he listed in the 1860 business directory. The first unequivocal instance of Fardon's presence in Victoria is a ship arrival notice for the steamer *Pacific* from San Francisco on June 15, 1860 on which "Mr. Fardon" is listed as a passenger (*Daily British Colonist* [Victoria], June 16, 1860). Fardon was assessed and taxed under the Vancouver Island colony's Trade Licenses Act on January 1, 1861 as a photographer on Government Street. He may also have been the "photographist" responsible for photographing a corpse and charging the widow $20 for expenses (brandy, cologne and three handkerchiefs) to keep himself from fainting (*Daily British Colonist*, October 23, 1860). The only other known photographer in Victoria at this time was Stephen Allen Spencer (1829?–1911), who may also have had the commission. One of the first known Victoria newspaper ads for "Fardon's Photographic Gallery" was published on March 2, 1861 in the *Daily British Colonist*. On March 28, 1861 the same newspaper noted the addition of "G. Farden" to the membership of the Industrial Exhibition Committee which began planning the previous month for the Vancouver Island colony's submission to the 1862 London International Exhibition. One of the photographs Fardon contributed, a multi-part panorama of Victoria, was reproduced as a wood engraving in the *Illustrated London News* on January 14, 1863 (*National Archives of Canada, Ottawa, Ontario*).

While Fardon continued to produce a few outdoor photographs in Victoria, the mainstay of his business was portraiture. He photographed many of the city's founding families, as well as visitors, such as members of the British Royal Engineers detachment, from the mainland colony of British Columbia. Fardon's earliest portraits generally see the customer standing with a headstand for support. The studio backdrop is plain, with a wide floorboard moulding and carpeted floor. Sometimes a curtain, tied back, appears on the right. In some of these early Victoria portrait photographs Fardon appears to have encouraged a relaxed attitude with his sitter lounging in a chair next to a table. A few early portraits are also group shots of two or three individuals, sometimes family members, sometimes civil servants. Later portraits contain more elaborate props and backdrops. In addition to these carte-de-visite full-figure views, he also produced head and shoulders portraits. Unlike his time in San Francisco, Fardon placed newspaper and book advertisements indicating his portrait specialties: "Cartes des visite. Likenesses on patent leather, paper, or glass. Children under 5 years, $3." (*Daily British Colonist*, October 4, 1862). Besides the nine patent leather portraits now owned by the *Victoria and Albert Museum, London, England*, which were exhibited at London International Exhibition in 1862, only one other such portrait can be attributed to Fardon. This is a full-figure carte-de-visite size studio portrait of Sarah Crease, wife of H.P.P. Crease, a lawyer, judge and knight (*British Columbia Archives, Victoria*). The carpet pattern and plain studio wall match several other portraits taken in Fardon's studio; based on information accompanying the photograph it was taken before June 1863. Two other photographers in Victoria in 1862 who advertised patent leather photographs were S.A. Spencer and Blacklin & Bristow.

In October 1863 Fardon relocated his studio to a brick building on the corner of Langley and Yates Streets. Fardon returned to England between July 1865 and July 1866. He hired Noah Shakespeare (1839–1921) to manage his studio. When Fardon returned, Charles (Carlo) Gentile hired Shakespeare in August 1866. One of Fardon's last newspaper ads started appearing in the *Daily Colonist* in mid-September 1869. When Benjamin F. Baltzly, an employee of Montreal's William Notman, visited and photographed in and around Victoria in July 1871, he captured a sign advertising Fardon's business

on the side of the building housing his studio (*Notman Photographic Archives, McCord Museum, Montreal, Quebec*). Fardon retired from photography in Victoria in the early to mid-1870s and in 1876 moved to Oakland, California. He operated a photo studio with William H. Bluett (Bluett & Fardon), then left the field permanently upon his return to Victoria in 1877. Fardon died on August 20, 1886 and was buried in Ross Bay Cemetery, Victoria, British Columbia. A very weathered white marble headstone marks his grave (Block F, plot 32 W 21A) which is near his half-brother A.J. Langley's grave (Block F, plot 32 E 21).

Biography

George Robinson Fardon was born in 1807 in Birmingham, Warwickshire, England. By the late 1840s he was living and working in New York City as a commission merchant. He was in San Francisco, California, by the mid-1850s. Where or when he learned photography is unknown. In September 1856 Herre & Bauer published Fardon's *San Francisco Album*, believed to be the first photographic compilation depicting an American city. Fardon exhibited some of these views in the Mechanics' Institute's First Industrial Exhibition (1857). The next year he was awarded a bronze medal for his display which included portraits on patent leather. Following the discovery of gold on the Fraser River, British Columbia, Fardon made a number of trips to Victoria, Vancouver Island, where he purchased property, chiefly on behalf of a relative. Fardon first advertised as a photographer in Victoria in 1861. As part of the Vancouver Island entry to the London International Exhibition (1862), he submitted at least portraits on leather taken in Victoria. Although primarily a studio portrait photographer, Fardon's outdoor work included group portraits, buildings and a multipart panorama of Victoria (*London Illustrated News*, January 14, 1863). Following his retirement from his Victoria photographic in the mid-1870s, he moved to Oakland, California, where he had a brief photographic partnership with William H. Bluett (Bluett & Fardon). Fardon subsequently returned to Victoria where he died on 20 August 1886. He is buried in Ross Bay Cemetery, Victoria, BC.

DAVID MATTISON

See also: Claudet, Frances George; Claudet, Antoine-François-Jean; and Notman, William.

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FARMER, ERNEST HOWARD (1856–1944)

English physicist and photographer

Ernest Howard Farmer was born in Brighton in 1856, the second son of Robert Farmer, one of Brighton's early portrait photographers who had opened 'Mr Farmer's Daguerreotype Rooms' in the town in 1853. At the time of Ernest's birth, the family was resident at 59 North Street, Brighton, described as 'Mr Farmer's Old-Established Photographic Rooms' despite the studio's relatively short existence. By 1859, Robert Farmer was dead, and Howard, one of three children was brought up by his mother Harriet. He was the only one of the three children to survive into adulthood and, by the 1881 Census he was resident in Lambeth, London, his occupation listed as physicist, with his widowed mother living at the same address. Harriet's occupation was listed as 'charwoman.'

While still a young man, he became interested in amateur photography, his scientific training fuelling a curiosity about how the photographic process worked.

After his appointment as a teacher of photography, Farmer was appointed the first Head of Photography at the Regent Street Polytechnic, and is remembered as the inventor of 'Farmer's Reducer,' the mixture of potassium ferricyanide and sodium thiosulphate which is still used today to lighten excessively dense negatives and prints. He published the formula for his reducer in 1883.

JOHN HANNAVY

FENTON, ROGER (1819–1869)

British photographer

Born into the security of a wealthy Lancashire family, Roger Fenton was under no pressure to pursue a challenging or financially rewarding career. Despite that, he

Fenton, Roger. Still Life with Fruit. *The Metropolitan Museum of Art, Gilman Collection, Gift of The Howard Gilman Foundation, 2005 (2005.100.15) Image © The Metropolitan Musem of Art.*

chose to study and practice law, and to engage with the emerging profession of photography. After undertaking some initial tuition in painting in both London and Paris, he qualified as a lawyer and took up the new art of photography, initially as a hobby. Photography became his abiding passion for many years, during which time he emerged not only as one of the pre-eminent professional photographers of his day, but also as a major driving force and guiding hand in the foundation of organised photography in the United Kingdom.

The impact of Fenton's involvement with early British photography was considerable and enduring—both from the point of view of his skill and vision as an image maker, and his involvement in the establishment of The Photographic Society of London, and its publication *The Photographic Journal*. Driven by his enthusiasm for discussion and debate, and the exchange of information between practitioners, he helped establish the model of photographic fellowship that endures to this day.

An interest in art remained with Fenton throughout his life, and influenced his approach to photography and photographic composition. In the years before he turned his attention entirely to photography, his friendships with Charles Lucy and Ford Madox Brown were clearly significant factors in the type of paintings he exhibited. In each of the three years 1849, 1850 and 1851 he had a painting exhibited at the Royal Academy, but after 1852, he appears only to have exhibited photography.

With Lucy and others, he was instrumental in the establishment of the North London School of Drawing and Modelling in 1850, and helped secure for that school the patronage of the Prince Consort, Prince Albert. Albert's acquaintance with Fenton and his work later developed into an enduring interest in the work of the Photographic Society of London, and led to Fenton taking on the role of instructor to the Prince in the rudiments of photography.

It is not certain when Roger Fenton's interest in photography first began, although it is likely that its genesis may be traced to his time in Paris in the mid 1840s. His earliest dated images, taken using a modification of Gustave le Gray's Waxed Paper Process, were produced in 1852, and thirty-nine of them were exhibited at London's first photographic exhibition organised at the Society of Arts in December of that year. These included three images from his recent trip to Russia, views taken around his home in Albert Terrace, London, at various locations in Gloucestershire, and of his birthplace—Crimble Hall in Lancashire.

Circumstantial evidence supports the long-standing opinion that Fenton was a founding member of the Photographic Club (often referred to as the Calotype Club) in 1847, but his name is notably absent from early references to this group. However, membership included Peter Wickens Fry, Peter le Neve Foster, Frederick Scott Archer, Joseph Cundall, Hugh Owen, Dr Hugh Diamond, Edward Kater, Robert Hunt, Charles Vignoles, F. W. Berger and Sir William Newton, many of whom became Fenton's lifelong friends.

No surviving images have yet been traced to support Fenton's practical involvement with the calotype process. Despite this, the evidence for including him in the

group remains persuasive, although just when he joined is unclear. His name was included in a list of six Photographic Club members in 1852 who approached William Henry Fox Talbot in an attempt to persuade him to waive licence fees for the calotype process. However, as Talbot at that time claimed patent jurisdiction over both the waxed paper and wet collodion processes, Fenton's membership as late as 1852 did not in itself establish him as a user of the calotype, by which time his enthusiasm for waxed paper was well documented.

In that same year the 'Organising Committee' or 'Provisional Committee' which steered the establishment of the Photographic Society of London (later The Royal Photographic Society) comprised the same six men—Fenton, Peter le Neve Foster, Sir William Newton, Peter Fry, Robert Hunt and Frederick Berger.

On a visit to Paris in October 1851, Fenton met Gustave le Gray, inventor of the waxed paper process, and two other accomplished photographers—Vicomte Joseph Vigier and Monsieur Pulch, both of whom published and used variants of le Gray's method. By April of the following year he was successfully exploiting the process in his photography in Gloucestershire, and by August had overseen the publication of his treatise "Photography on Waxed Paper" published in the fifth edition of W. H. Thornthwaite's *A Guide to Photography*, London, 1852. In that text he refers to Pulch's process as one he has used with considerable success.

Declining to recommend le Gray's formulation on account of the perceived weakness of its solutions, he detailed both Vigier's and Pulch's variants. In addition, he drew attention to the French preference for English papers—especially the thin paper produced by Whatman & Co—and the British preference for French papers, especially those produced by Lacroix and Canson.

In the following months, Fenton was in Russia, using waxed paper to photograph work on Charles Vignoles' bridge over the River Dneiper at Kiev, making a series of stereoscopic views intended for viewing through Charles Wheatstone's Reflecting Stereoscope.

Authorship of a treatise on a relatively new process, and the production of a series of accomplished images both in England and in Russia both point to Fenton's initial engagement with photography having taken place well before the spring of 1852. The absence of any images from before that time, however, is curious.

The preparation for, and the journey to Russia in the autumn of 1852 was almost certainly Fenton's first involvement with stereoscopy, but as an amateur photographer. The professional photographer in the team was J. C. Bourne, and Fenton's work for his friend Vignoles in Kiev can be assumed to have been quite separate from Bourne's professional assignment.

Fenton prefaced the journey with some experimental photography at Regent's Park Zoo, evaluating methods of producing effective stereoscopic imagery. His subjects included a dead stag which was photographed using a series of different approaches to produce the optimum stereoscopic effect. Three surviving pairs of images from large format waxed paper negatives attest to these experiments, and the separations range from less than a metre to several metres. In the subsequent stereoscopic pairs produced in Russia, the distance between the two taking positions appears to be in the region of one to two metres, resulting in images which create a slightly exaggerated stereo effect when viewed in the Reflecting Stereoscope. On location in Kiev and Moscow, Fenton's experimentation provided the foundations for some remarkable stereoscopic views of Vignoles' bridge construction site in Kiev, and of the buildings in the Kremlin, Moscow.

The Russian images mark a significant change in Fenton's photography, and the journey produced the first images which significantly contributed to his enduring reputation as a major image-maker. One photograph, *Domes of the Cathedral of the Resurrection, Kremlin*, is now considered by historians and collectors to be an icon of early photography. Intriguingly, it does not appear in the list of photographs by Fenton exhibited at the exhibition in December 1852. Yet, included were images such as *Pittevilla Spa, Cheltenham* and *The Old Well Walk* which had been less than well received when first published in *The Photographic Album* earlier that year.

Fenton's enthusiasm for establishing a British photographic organisation in London predates his earliest dated images by some months—again attesting to an already established enthusiasm for photography.

The Societé heliographique, the world's first (but short-lived) photographic society, was established in Paris in January 1851 with Baron Jean-Baptiste Louis Gros as President, and in October 1851, Fenton travelled to France to meet the society's founders, and learn of their aims and objectives. His paper 'Proposal for the formation of a Photographic Society' appeared in *The Chemist* magazine in March 1852, and was an abridged version of a much longer paper which recent research has attributed to Antoine Claudet. Fenton and Claudet were both ardent advocates of a forum in which photographers could discuss and progress their art, so a degree of collaboration in the development of such a proposal is not surprising. By June 1852, an Organising Committee, formed to promote the establishment of the new society, had elected Fenton as its Honorary Secretary, and it is clear that many of the fundamental principles which guided their efforts originated with Fenton—particularly the establishment of a regular journal which would disseminate papers on new development in photography,

and encourage interaction between members in dealing with the medium's challenges and constraints.

At the Society's inaugural meeting on January 20, 1853, Fenton read a number of important papers on how the new society might conduct its business. He was elected as Honorary Secretary and, three weeks later, with Hunt and Vignoles, established the Publications Committee, becoming co-publisher with Dr John Percy of the *Journal of the Photographic Society*.

Fenton's decision to turn his hobby into a profession was taken in the summer of 1853, and seems to have been provoked by a request from the British Museum for advice on the establishment of a photographic studio and darkroom. Independently, both Fenton and Philip Henry Delamotte were asked to advise, and both agreed willingly. Each man also offered his services to the museum as photographer—Delamotte in August 1853 and Fenton two months later. On the recommendation of Wheatstone's Fenton was appointed, and for the next six years he maintained an important association with the museum.

Fenton produced a wide-ranging body of work, much of it photographed on the 'leads,' a flat roof area where a makeshift open-air daylight studio could be set up. The manhandling of rare works of art and historical artefacts up to this location, and dusting them with chalk to reduce reflection, suggest that the value of creating photographic images for dissemination throughout the world at times overruled the normal considerations of conservation.

In his business dealings with the museum, he introduced a number of innovative marketing approaches, including an agreement to produce negatives without charge in return for the right to sell prints himself made after the museum's orders had been fulfilled. This culminated in the establishment of a sale kiosk in the museum foyer, where images were sold to the visiting public by Fenton's staff. The success of this venture, in addition to substantial print orders from the museum trustees themselves, kept a number of staff at Fenton's printing establishment occupied.

While his work with the museum was proceeding, Fenton was also moving into other areas of photography. In early 1854 he was commissioned by Queen Victoria to produce a series of formal and informal royal portraits, resulting in some of the most atypical and striking portraits of the Queen ever produced. His abilities as a portrait photographer and as a creator of informal 'tableaux vivants,' which is evidenced by a body of work produced at Buckingham Palace, Balmoral Castle and Windsor Castle, were considerable.

Later in 1854, during a photographic trip to Yorkshire, he field-tested the photographic van with which he would subsequently travel to the Crimea. The 360 Crimean War images, which he produced between March and June 1855, ensured that the legend 'first war photographer' would invariably be attached to his name.

The Crimean War images, produced for commercial sale through the printsellers Thomas Agnew & Sons and P. & D. Colnaghi, were photographed to an agenda which avoided confronting Victorian sensibilities, and which was more than a little conscious of the political importance of the story being told. Fenton's letters home—to Agnew and to his wife Grace—established the true story of the war as seen through the photographer's eyes in a way his pictures did not.

While photography was undoubtedly limited in what could be captured—considering the low sensitivity of the wet collodion process, and the cumbersome nature of the equipment—Fenton's images contain little of the drama found in photographs by James Robertson, and others. Only on one occasion, in the chilling *Valley of the Shadow of Death* is there any suggestion of the real nature of what has been described as the last medieval war, and the first of the modern era. Otherwise the body of work for which Fenton is most widely known consists of finely executed camp scenes, harbour scenes and military portraits. As a commercial venture they enjoyed limited success, as the war was over before they were made widely available to the public. The long-term damage to Fenton's health from the cholera he contracted while in the war zone contributed to his early death.

It is interesting to observe that despite the often highly critical published reviews of his architectural and landscape photographs in the early 1850s, Fenton rose to a position of pre-eminence in these branches of photography in the mid and later 1850s and early 1860s.

His mastery of light and of composition take his images well beyond the obviously picturesque, although clearly paying homage to the Victorian ideals of the romantic landscape. Abbeys, priories, great houses and castles, and the rolling landscapes of Lancashire and Yorkshire were frequent subjects—often taken during visits to his family or his wife's families—while views in the Scottish Highlands date from his visit to Balmoral.

Several visits to North Wales resulted in a fine series of large views, and an extensive collection of images for the Brewster stereoscope, later published both as books, and as sets of stereocards. In these majestic images, the wet collodion negative process and albumen printing paper were often pushed to their limits to capture the fleeting subtleties of light and shade. In Ribblesdale, his subject matter ranged from the impact of industry on the landscape—the *Bobbin Mills at Hurst Green*—through to the delicate tones and hues of *Morning, the Keeper's Round*, where shooting into the low sun, Fenton captures a gamekeeper, seemingly oblivious to the camera, walking his dawn round.

In the several versions of the series, *A Vista, Furness Abbey,* again shooting into the light, strong shadows pull the viewer through and past a figure, or figures, standing in the archway towards a more distant animated group. With notable exceptions, figures in Fenton's landscape and architectural photographs are relatively rare, usually appearing only to add scale to a building or an expanse of landscape. However major assignments demonstrated that he was just as accomplished in the photography of the animate as the inanimate. The royal portraits (1854–1857), the Crimean War images (1855), ghillies and gamekeepers in Scotland and Lancashire (1856–1859), a cricket match (1857) and the Queen's Cup shooting match at Wimbledon (1860) all serve to demonstrate the breadth of his understanding of his medium. His exceptional achievement in figural photography is a series of studio compositions exploring exotic and middle eastern themes produced in the late 1850s, with titles such as *Nubian Water Carrier* and *Pasha and Bayadère.* Inspired by a Victorian fascination with the mysterious east, these images sit somewhat apart from the main body of Fenton's work. Recent researches in the USA have thrown much fresh light on the extent of this work, its inspiration and its reception amongst Fenton's peers.

Towards the end of his relatively short photographic career, Fenton embarked on the production of a series of elaborate still lifes, exploring the textures and patterns of fruit, game and other often unrelated objects. Considered to be the height of photographic art when first exhibited, these images also mark the zenith of his technical achievement with the medium. These images won him many awards and plaudits, including a medal at the 1862 International Exhibition. It was in a text accompanying a stereoscopic pair of just such a composition that the *Stereoscopic Magazine* in 1862 announced Fenton's retirement from photography, and his return to the legal profession.

An auction sale of all his work—negative and prints—resulted in the major proportion of his landscape and architectural views being purchased by Francis Frith, and subsequently published as a series of themed bound volumes—*The Works of Roger Fenton*—including such titles as *Cathedrals* and *Landscapes*. Frith continued to publish some of the views until the end of the nineteenth century, and sections extracted from several others continued in print as postcards until well after the Great War.

JOHN HANNAVY

Biography

Roger Fenton was born in 1819 at Crimble Hall, near Rochdale in Lancashire, one of seventeen children born to his mother and stepmother. The family's wealth came from mills and banks in the Rochdale and Heywood areas of Lancashire. His father, John, became the first Member of Parliament for the newly created Rochdale constituency in 1832, and for a few years sat on the same side of the house as the Whig (Liberal) MP for Chippenham, William Henry Fox Talbot.

At the age of seventeen, Roger was enrolled at University College London, to study mathematics, Greek and Latin, and graduated with the degree of Bachelor of Arts in 1840. In the same year, he enrolled to study law at UCL, and also developed an enduring interest in drawing and painting. In 1843 he married Grace Maynard, by whom he had five daughters and one son. Both his eldest daughter and his son died in childhood. By 1844 Fenton was studying art in Paris, and upon his return to England, developed friendships with Ford Madox Brown, Charles Lucy, and other leading painters of the day. Despite being called to the Bar in 1851, Fenton continued to practise as a solicitor for some years, with offices in King William Street in the City of London. He is also believed to have kept chambers in the Temple from 1852/3 until 1865, although his work as a professional photographer occupied him full time from 1854 until 1862, when he resumed his law practice. For much of his married life, the family lived at 2 Albert Terrace, Regent's Park, London. He died at his home in Potter's Bar, Hertfordshire in 1869 at the age of fifty.

See also: Victoria, Queen and Albert, Prince Consort; le Gray, Gustave; Waxed Paper Negative Processes; Calotype and Talbotype; Wet Collodion Positive Processes; Talbot, William Henry Fox; Royal Photographic Society; and Société Héliographique Française.

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FIEBIG, FREDERICK (active 1840s–1850s)

German lithographer and photographer in India

Although unlisted in the Calcutta commercial directories (apart from presumably being the 'Feibig' recorded as a piano teacher in the 1849 and 1850 editions of *The Bengal and Agra Directory and Annual Register*), Fiebig is known to have been active as a lithographer in the mid-1840s, when he published a number of topographical views of the city. In 1846 he also visited Singapore, where he sketched a now-lost panorama of the town, with the apparently unrealised aim of selling lithographic copies to subscribers (*Singapore Free Press*, 2 April 1846). The only contemporary reference to his photographic work appears in a short article recording his visit to Madras in early 1852 ('Photography in Madras,' *Illustrated Indian Journal of Arts*, Madras, part 4, February 1852, 32). This confirms his German origin and notes that he had taken up photography 'nearly three years' previously. During this period he had become a prolific calotypist, producing the first extensive photographic documentations of Calcutta and Madras. The writer of the article attests to having been shown between seven and eight hundred views of Calcutta alone and also mentions Fiebig's photographic activity in China and Burma, although no examples from these locations have come to light.

By 1856, Fiebig was in England, where he succeeded in selling a collection of nearly 500 hand-colored salted paper views of Calcutta, Madras, Ceylon, Mauritius and Cape Town to the East India Company (British Library, India Office Records, Miscellaneous Letters Received, vol. 193, 1856). The views of Ceylon appear to have been taken in the course of his visit to South India in 1852, while the Mauritius and Cape material must have been taken during the voyage back to Europe. No further information on his movements has been traced.

Apart from the large series of prints now in the British Library, only a few small collections of his work have surfaced at auction in recent years. The rich tonality of these uncolored images perhaps gives a better indication of Fiebig's sophisticated skills as a calotypist, than the more lightly printed and sometimes crudely colored views held in the British Library.

JOHN FALCONER

FIERLANTS, EDMOND (1819–1869)

Belgian photographer and photographic publisher

Edmond Fierlants was born in Brussels on 20 July 1819. His father Nicolas Fierlants was a lawyer and joint founder of the Université libre de Bruxelles in 1834. Edmond was brought up as a member of the upper bourgeoisie, and was probably of independent means. In the late 1840s, he married a woman considerably younger than himself, Isabelle Nieuwenhuys (born in 1831). They divided their time between Brussels and Paris, where their first child Hélène was born in 1850. A son, Albert Jean, was born in Brussels in 1852.

During his stay in Paris, Fierlants learnt the rudiments of photography, and completed his technical apprenticeship under Hippolyte Bayard, whom he would thereafter refer to as his "authority." Guided by the experienced Bayard, Fierlants acquired a reputation as a technically proficient researcher, and in 1854 became one of 93 founder members of the Société française de photographie, the only Belgian on the list. In 1855, the Society's *Bulletin* refers to him as one of the "*habiles experimentateurs*" [skillful experimenters] of the Taupenot process. Fierlants pursued his research, drawn to the process for its use in landscape and architectural photography, and published an article detailing the process' advantages in the *Journal of the Photographic Society* [of London] in 1856.

Fierlants showed his work in public for the first time in 1857. His reproductions of paintings at the exhibition of the Société française de photographie were well received, and, on the strength of a growing reputation, he was invited to join the jury at the industrial arts exhibition in Brussels that same year. Fierlants was planning a return to Brussels in order to make photography a full-time occupation, an unusual step for a man of his background in the Belgium of that era. However, the Belgian state, created as recently as 1830, was in search of its national identity, one strand of which was a cultural heritage rich in art and architecture. This heritage needed its spokesmen and popularisers, and Fierlants conceived it as his mission to undertake this task within his chosen medium.

In a revealing correspondence to Martin Laulerie, secretary of the Société française de photographie, Fierlants outlined his plans. He wrote of his aim to photograph the paintings in the museums of Brussels and Antwerp, enlisting his colleagues' help to promote his "*entreprise*" [enterprise] and adding: "Je dis mon entreprise, c'est trop dire. C'est justement ce qu'il faut obtenir et vous savez que nul n'est prophète dans son pays, quand j'habitais la Belgique il y a quatre ans je ne m'étais jamais occupé de photographie…" [I call it my enterprise, but that's claiming too much. The aim is precisely that, and you know about a prophet being without honour in his own land—when I used to live in Belgium four years ago photography never interested me…] (undated letter written from Aix-la-Chapelle).

In fact, Fierlants proved more than successful in promoting his cause. Buoyed up by the encouragement of his peers, and the judicious use of his family's influence in government circles, Fierlants returned to Brussels

on 5 May 1858, and immediately began lobbying the Ministry of the Interior for support. The liberal minister Charles Rogier, sympathetic to Fierlants, referred the matter of the Académie royale de Belgique [Royal Academy of Belgium], which gave a favorable opinion: "…l'Académie comme le Gouvernement, comme le pays, doit désirer que la gloire de nos vieux maîtres soit popularisée par tous les moyens possibles" […the Academy, as the Government, as the country, must fervently wish that the glory of our old masters be popularised by every means possible] (*Bulletin de l'Académie royale de Belgique*, 2nd series, 5 (1858): 77).

Fierlants had already begun his campaign in the field, taking nineteen studies of Bruges architecture and making a request to the mayor of Bruges to photograph the art works in the Hospice of St John. He concluded an agreement with the publisher Victor Didron in Paris to publish his output. Appearing under the series title *Les grands peintres avant Raphaël, photographiés d'après les tableaux originaux* [Great painters before Raphael, photographed from the original paintings], the prints were praised for their size and accurate capture of surface tone and texture, at a time when most photographic reproductions of paintings were not made directly from the originals (unlike Fierlants' work), but were rather copy prints from engravings.

The momentum was unstoppable. Armed with favorable reviews and the goodwill of the Belgian government, Fierlants received successive commissions to record the historic art and architecture of the towns of Antwerp (165 views taken in 1860), Brussels (114 views taken between 1862 and 1864) and Louvain (39 views taken in 1865), full-plate images characterised by compositional rigour. He regularly exhibited his work, most spectacularly a life-size model of the Saint Ursula reliquary at the London international exhibition in 1862, on which Memling's panel paintings were represented by Fierlants' albumen prints, perhaps hand-coloured.

Fierlants founded the Société belge de photographie in 1862, trading from custom-built premises at rue Keyenveld 69 (renumbered 73) in the commune of Ixelles. He moved in with his family on 25 July 1862, and it would serve as his studio, photographic publishing house, office and residence for the next five years. The company was granted a royal warrant in 1863, and the Société royale belge de photographie Ed. Fierlants et Companie published a stock catalogue in 1865, running to nearly 1400 items. But by this time, municipal support was drying up; in the wake of missed deadlines and unpaid bills, Fierlants turned to his final sudsidised project, an edition of the life-work of Belgian artist Antoine Wiertz (1806–1865), whose singlemindedness in pursuit of his monumental art must have chimed well with Fierlants' own driven outlook.

At the end of 1867, divorced and in debt, Fierlants opened a branch portrait studio at Montagne aux Herbes Potagères 4, moving there alone on 31 December 1867. The studio did not enjoy commercial success, and Fierlants was forced to relinquish control of his company. He died at the studio, a ruined man, on 21 December 1869. Under the directorship of Alexandre de Blochouse (1821–1901) from 1869 to 1885, the Société royale belge de photographie outlived its founder's vision of popularising Belgium's cultural heritage, operating as a middling photomechanical printing press.

The municipal archives in Antwerp, Brussels and Louvain house their respective commissioned series of town views and monuments. These are complemented by substantial holdings in the Bibliothèque royale Albert Ier— Cabinet des estampes, Brussels. The Rijksmuseum —National Photography Collection, Amsterdam, has a comprehensive run of books photographically illustrated by Fierlants. The municipal archives, Antwerp, also has a contemporary set of wet-plate negatives, probably supplied by Fierlants as part of his commission.

STEVEN F. JOSEPH

Biography

Edmond Joseph Marie Fierlants was born in Brussels on 20 July 1819 into a prominent family. In the late 1840s, he married Isabelle Nieuwenhuys (born in 1831), and had two children. Fierlants learnt photography in Paris under Hippolyte Bayard. Founder member of the Société française de photographie, Fierlants won a reputation as the photographer of Belgium's cultural heritage rich in art and architecture. Fierlants received commissions to record the historic monuments of Antwerp, Brussels, and Louvain. Fierlants founded the Société belge de photographie in 1862, trading from rue Keyenveld 69 (renumbered 73) in Brussels-Ixelles. Granted a royal warrant in 1863, the Société royale belge de photographie published a stock catalogue in 1865. In 1867, divorced and in debt, Fierlants opened a portrait studio at Montagne aux Herbes Potagères 4. The studio did not bring success, and Fierlants was forced to relinquish control of his company. He died a ruined man, on 21 December 1869.

See also: Bayard, Hippolyte, and Société française de photographie.

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FINLAND

Advance reports in Swedish-language newspapers ensured that a single daguerreotype would be a sensation when displayed in Turku, and Helsinki, Finland, in the New Year of 1840. The local doctor of Turku, Henrik Cajander (1804–1848), acquired details of the process while travelling in France, and produced Finland's first photographic image on his return in 1842. Thereafter, photography was influenced by political and economic aspirations as Finland sought independence from Russia, of which it remained a province until 1917.

The first notable Finn was a bookbinder, Fredrik Rehnström, who was born in Mäntyharju and in 1844, established a business based on skills learned in St Petersburg. For seven years, he travelled the country as an itinerant photographer offering daguerreotype portraits, which were popular because he photographed his customers in familiar locations, (rather than studio settings). On retirement, Rehnström moved to St Petersburg.

Other early photographers were foreigners, attracted by the market of Finland, but who introduced important skills. Two Estonians, Beno Lipschütz and Baptist Tensi offered daguerreotypes in Helsinki, Turku and Viipuri in 1848, and three years later a German, Friedrich Mebius, introduced the calotype to Helsinki. Two Danes ran successful studios for many years—Petter Christoffer Liebert began in 1842, and lasted for over twenty years, whereas countryman Charles Riis, took over the thriving business of Karl Eugen Hoffers when the latter returned to Prussia in 1871.

Hoffers had been in competition with Carl Adolph Hårdh of Sweden since 1860. Both men ran successful businesses in Helsinki and had established reputations, especially when working out of doors. Hårdh died in 1875 and a Swedish colleague, Fritz Hjertzell, ran the studio on behalf of his widow (whom he later married).

During the 1860s, famine was eradicated from Finland and improved prosperity coincided with a phase in which the *carte-de-visite* became popular. The system had been introduced by the Borchardt brothers of St Petersburg, who launched the service in Helsinki by asking high prices, but with improved incomes, Finnish people enjoyed patronising the professional studios. An attraction of the *carte-de-visite* was the twelve copies that were provided at one sitting; this had initiated an enthusiasm for collecting portraits to create albums of families. Simultaneously, the working classes began to have a say in running the country and to many, the possession of a self-portrait by the economical ferrotype process symbolised power and ownership.

In 1859 the newspaper *Wiborg* reported that a merchant's widow, Caroline Becker, had opened a portrait studio in Viipuri, and in the same year, Hedvig Keppler, the clockmaker's daughter, advertised in the *Åbo Underrättelser* newspaper to announce her studio in Turku. Trained in St Petersburg in the ambrotype process, she traded during the summer of 1860, "until the waters freeze." When she married a baker, Carl Fredrik Löfman, the couple moved to Salo and she terminated her photographic career.

Only large towns, such as Helsinki, Turku, Viipuri and Oulu (in the north), were able to support a business but the introduction of the cabinet photograph allowed studios to promote an alternative to the increasingly popular *carte-de-visite*. An apprentice scheme coped with the demand for assistants, many of whom were engaged to colour photographs by hand.

A Norwegian influenced Helsinki photographic circles when he set up his studio in the capital in the summer of 1877. Nineteen-year-old Daniel Nyblin had studied in Oslo and the United States, and had been running Riis's studio for two years. He quickly established a reputation for attractive poses which made use of studio accessories. For the next ten years, he photographed academics, civil servants, tradesmen, artists, citizens, artisans and the gentry, as well as many of the visitors passing through Helsinki *en route* to and from St Petersburg, and his cabinet-sized portraits of well-known people were successfully sold to the public. His cousin Georg enhanced the Nyblin reputation by opening a studio in Turku in May 1885.

Daniel Nyblin also pioneered the marketing of albums of photographs featuring Finnish life. Some of the photographs were reproduced from paintings, others were coloured by hand, and the sets proved to be popular in remote areas. Whilst travelling in Europe, Nyblin had become aware of the value of exhibitions and worked hard to unite amateur and professional photographers within the Amateur Photographic Club of Helsinki,

which had been founded in 1889. A successful exhibition was held in 1892 when 24 members exhibited 375 photographs, and soon similar clubs were established in Turku, Viipuri, Vaasa and Tampere.

Nyblin's pre-eminence was challenged in 1889 by the arrival of K E Ståhlberg, and by Christmas 1890, Ståhlberg adopted Nyblin's ideas and offered his customers photographs of the countryside. He printed them larger than the familiar cabinet-size urban views and they had immediate appeal. To consolidate his idea and increase the coverage of the country, he recruited travelling photographers, which included Into Kondrad Inha and Samuli Paulaharju. At the time, Finnish law required identification to be incorporated on the contact prints, details of author, studio, date and location of the photographs have survived. For indoor photography, Ståhlberg freed himself from the inferior natural lighting of Nordic winters by equipping his studio, the Atelier Apollo, with electric light in 1900.

In 1870, the Finnish Literary Society had awarded a scholarship to Reinhold Theodor Hausen to assemble a photographic record of historical monuments, and with the advent of dry plates, photography become an important aspect of the official expeditions, which explored and surveyed Lapland between 1877 and 1887. The Finnish Polar Expedition (1882—84) had a remit to study the northern lights at Sodankylå but no useful records were obtained by the expedition engineer, Karl Granit, on account of limitations in the materials and equipment.

The value of photography was further recognised in 1890 when Helsinki Observatory participated in an international study of the heavens and Anders Donner recorded the stars during the next twenty years. The success of an exhibition of photographs, staged by the Geographical Society of Finland in 1894, provided the basis for many important studies in the 20th century.

RON M. CALLENDER

See also: Calotype and Talbotype; and Cartes-de-Visite.

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The chemist George Thomas Fisher Jr. authored one of the early popular manuals on photography—*Photogenic manipulation, containing plain instructions in the theory and practice of the arts of photography: calotype, cyanotype, ferrotype, chrysotype, anthotype, daguerreotype, and thermography*. First published as a 50 page book in 1843 by George Knight of London, it ran to three editions in two years. In the following year, the book was translated into German and Dutch and editions published in Leipzig by Händel, and by Stenfert Kroese in Arnhem.

In 1845, expanded to 56 pages, the book was split into two sections, with section two dealing exclusively with the daguerreotype. Published in both Great Britain, by Knight, and the US by Carey & Hart of Philadelphia, it was even more successful than the original. In 1848, the book was completely rewritten by Robert Bingham, still using the title *Photogenic Manipulation*, Part 1 at 72 pages and part 2 at 58 pages, running to many subsequent editions into the mid-1850s.

In September of 1851, an article by Fisher appeared in the *Photographic Art Journal* on "Thermography—Electrical and Galvanic Impressions."

Little is known of Fisher's life except that he styled himself, at the time the first edition was published, as 'Assistant in the Laboratory of the London Institution.' Gernsheim (*Incunabula of British Photographic Literature*, 1984) states that the authorship passed to Bingham in 1848 after Fisher's death, but the 1851 article in the *Photographic Art Journal* would seem to question that.

JOHN HANNAVY

FISKE, GEORGE (1835–1918)

George Fiske was born to farming parents in New Hampshire, and trained as a banker in San Francisco, before turning his attention to photography. He is reputed to have joined Robert Vance and Charles Leander Weed—the first person to photograph in Yosemite as an assistant, and an assistant to Carleton E Watkins as well.

Fiske moved to Yosemite with his wife in 1879, devoting the remainder of his working life to studying and photographing the landscape, alongside Galen Clark, who had become the first Guardian when the national park was created in 1864. When Clark's book *The Yosemite Valley: Its History, Characteristic Features, and Theories regarding Its origins* was published by Nelson L. Slater in 1910, the majority of the illustrations were by Fiske.

Living in Yosemite all year round, he was the first to photograph the valley in winter, creating dramatic

photographs which sold widely. A house fire in 1904 destroyed many of his negatives unfortunately.

Fiske, reportedly 'tired of living,' killed himself in 1918, and but for the interest of the young Ansel Adams, many of his images might have been lost. Adams printed from the surviving large format negatives in the 1920s, and campaigned for their proper conservation but was ignored. The plates, stored in the attic of a Yosemite Park Company sawmill were destroyed in another fire in 1943.

JOHN HANNAVY

FITZGERALD, LORD OTTO AUGUSTUS (1827–1882)

Lord Otto Augustus Fitzgerald was a man of many talents. Apart from attending most high society parties and functions, he was also a composer. He composed a piece in the 1840s called The *Spirit of the Ball*. Fitzgerald married Ursula Lucy Grace Bridgeman, formally known as the Dowager Lady Londesborough, on December 14, 1861. Fitzgerald held numerous posts in his lifetime: he was a Lieutenant in the Lancashire Hussars, a Treasurer of the Household in 1866 and an MP for Kildare. Fitzgerald was also a founding member of the Dublin Photographic Society. Along with other keen photographers, Fitzgerald regularly attended meetings at the premises of Mr. W. Allen, a local chemist who resided at 48 Henry Street, Dublin. In 1854 the group named themselves the Dublin Photographic Society and Fitzgerald was appointed to be its President. He held this position for four years, from Nov. 1854–1858. From 1857 the society held exhibitions, which continue today. It is the second oldest photography society in the world, and many of its early members went on to immeasurably influence photography and its development. An example of Fitzgerald's own work is an image that he took and printed himself in the inaugural year of the society, entitled 'The Meeting of the Waters, Killarney.'

JO HALLINGTON

FIXING, PROCESSING, AND WASHING

The impetus for work on fixing, processing, and washing was motivated by the problem of image stability in photographs. From 1798 until 1839, Thomas Wedgwood and Humphry Davy, Joseph Nicéphore Niepce, William Henry Fox Talbot, and Louis-Jacques-Mandé Daguerre all encountered difficulties in fixing their photographic images. Yet the answer was established as early as 1777, when Carl Wilhelm Scheele published a dissertation on the chemical action of light, in which he observed that ammonia checked the light sensitivity of silver chloride. In 1819, John Frederick William Herschel discovered

Durieu, Eugène. Nude.
The Metropolitan Museum of Art, Gilman Collection, Purchase, Mr. and Mrs. Henry R. Kravis Gift, 2005 (2005.100.41) Image © The Metropolitan Museum of Art.

the solubility of silver chloride in ammonia hyposulphite. Herschel's published results (1821) led Joseph Bancroft Reade, in 1839, to test the properties of sodium thiosulphate in fixing silver chloride images on paper, and it has been suggested that Reade apprised Herschel of his work. In 1839, Herschel proposed sodium thiosulphate (termed 'hypo') as a photographic fixing agent and made his results known to Talbot. Like Daguerre, Talbot was fixing his photographs in a concentrated solution of sodium chloride, which inactivated the unexposed silver chloride but did not remove it, so that the photographs remained somewhat light-sensitive. But whereas Daguerre adopted hypo once he learned of Herschel's discovery in 1839, Talbot used potassium iodide and, later, potassium bromide to fix his calotype negatives, and only in 1843 did he try sodium thiosulphate, in a heated solution.

Sodium thiosulphate became the standard fixing agent for silver halide processes and was used for wet collodion negatives. However, the gelatin silver prints and dry plate negatives of the 1880s and 1890s carried thicker photo-sensitive coatings, and the action of the

fixer had to be more vigorous; an acidified fixer of ammonium thiosulphate was eventually substituted. When used with alkaline developers, this required an intermediate acidified 'stop bath.' Organic developers (such as pyrogallol, hydroquinone, and eikonogen) required an acidic clearing agent to eliminate fogging. In 1889, Alexander Lainer discovered that sodium bisulphite could be added to sulphurous acid for a one-stop fixing bath. Non-silver processes (such as cyanotype and platinum prints) require different fixing or clearing baths: cyanotypes are cleared in plain water, and platinum in a weak solution of hydrochloric acid.

The fixing of a silver image necessitates dissolution of the unexposed silver halides, which remain photosensitive after development. To stabilise the image, a chemical fixer is used to convert the halides into soluble silver compounds that can be removed by washing. Washing may not clear all residual silver complexes, or remaining fixer: the former may be stabilised by toning, while the latter requires a hypo clearing bath.

By 1855, it was recognised that silver photographs had poor archival permanence, and in May of that year both the Photographic Society of London and the Société française de photographie set up committees to investigate the fading of positive photographs. Both efforts had been inspired by Louis-Alphonse Davanne and Jules Girard, whose initial analysis was presented to the Société in March and April 1855. Contributions were also made by Baron Humbert de Molard, Eugène Durieu, Thomas Hardwich, Thomas Malone, and George Shadbolt. It was discovered that residual fixer carries sulphur compounds, which convert the metallic silver of the image to silver sulphide. Silver sulphide is yellowish in colour and has half the density of metallic silver, producing irreversible yellowing and fading in the image, particularly in the highlights and mid-tones. In 1866, John Spiller reported that in albumen prints, residual sulphur compounds in the egg-white coating exacerbated deterioration.

Sulphiding could be prevented by gold-toning, as discussed below, but also crucial was the proper removal of the fixing compounds, achieved by prolonged washing in clean water and the use of clearing agents. Many hypo clearing agents were suggested, with the most effective being a weak solution of sodium sulphate, or ammonia combined with hydrogen peroxide. Silver prints on paper typically require about an hour to wash out the fixer, although in 1855, Thomas Sutton recommended several hours for paper negatives, and up to twenty-four hours for positive prints. Numerous chemical tests for hypo were proposed, with potassium permanganate, mercuric chloride, and silver nitrate being the most accurate.

In 1840, Hippolyte Fizeau discovered that treatment of a silver photograph in a solution of gold chloride would partially replace and partly plate the silver particles, producing a stable silver-gold alloy. Toning often preceded fixing, but Fizeau combined both, using gold chloride and hypo in a ratio of one to three-hundred. Both alkaline and acid toning baths were used, and in the 1890s, combined toning-fixing baths were introduced for self-toning silver gelatin and collodion papers, with the addition of potassium and ammonium thiocyanate, or the substitution of lead acetate for the gold chloride. More recently, it has been established that there is a protective effect to residual silver sulphide, which is actually more stable than pure metallic silver.

The mechanics of fixing, processing, and washing influenced the design of studio and field darkrooms. However, the processing environment and problems of ventilation, consistent temperature and humidity, water supply, and contamination were largely unaddressed until the late 1880s, when industrial photographic printing works established large-scale, rapid processing and washing facilities.

HOPE KINGSLEY

See also: Wedgwood, Thomas; Davy, Sir Humphry; Niépce, Joseph Nicéphore; Talbot, William Henry Fox; Daguerre, Louis-Jacques-Mandé; Scheele, Carl Wilhelm; Herschel, Sir John Frederick William; Reade, Joseph Bancroft; Calotype and Talbotype; Wet Collodion Negative; Gelatin Silver Print; Dry Plate Negatives: Gelatine; Cyanotype; Platinum Print; Davanne, Louis-Alphonse; Humbert de Molard, Baron Louis-Adolphe; Durieu, Jean-Louis-Marie-Eugène; Malone, Thomas Augustine; Shadbolt, George; Spiller, John; and Fizeau, Louis Armand Hippolyte.

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FIZEAU, LOUIS ARMAND HIPPOLYTE (1819–1896)

French physicist

Fizeau was born in Paris on September 23 into a well established family. His father had been a professor at the Faculté de médecine de Paris, where he taught pathology since 1823. As a boy he spent his youth between Paris and the family property of Suresnes. With the end of his secondary studies at Stanislas college, during the years 1840, he worked many jobs, but Leon Bernard Foucault, who was independently weathly, enabled him to fully devote himself to the study of sciences such as medicine initially, then physics, and later optics at the Collège de France, where he attended the lectures of Victor Regnault, and at the observatory of Paris under the direction of François Arago. He was undoubtedly influenced by the surgeon Alfred Donné, who he knew through his friendship with Foucault. Fizeau became interested in the Daguerrian process, in which he made great efforts to become very quickly accomplished.

In August 1840 he presented, in front of the Académie des Sciences, his process to improve testing methods by covering them with a thin metal gold varnish, obtained by a dissolution of gold chloride mingled with soda hyposulphhee. This method, provided the advantages of considerably reducing the mirror effect of the daguerrian plates by raising the tone of the images, and of making the images more resistant to damage caused by friction, abrasions, and oxidations. This major innovation gave him recognition nationally and internationally within photographic communities. In 1841, Fizeau began working on an original method of engraving the daguerreotype, of which Sir W.R. Grove presented on the same topic that year at the London Electronical Society. Fizeau's method, however, combined the use of acid, fatty oil and gold, and enabled him to transform the plates into matrices for engraving.

In 1842, this complex process of engraving was used for three illustrations of the second volume of the *Excursions daguerriennes* celebrated in Lerebours' publication. The following year, after various improvements, Fizeau protected his invention through the use of a patent, and also that year, Claudet introduced the process in England. At the same time, Fizeau became interested in the reduction of exposure times and introduced in 1841, an accelerating agent similar to bromine, which enabled him to produce images in approximately 15 seconds. This solution was undoubtedly suggested to him by engraver Augustin-François Lemaître, who was the former collaborator of Niépce and Niépce de St-Victor. But Lemaître was not the only engraver consulted by Fizeau in his research. Fizeau collaborated with Louis Henri Brévière, the director of the engraving of Royal Printing works.

Until 1849, Foucault and Fizeau, probably encouraged by Arago, jointly worked together to find the exact analysis and the measurement of various photographic light sources. It was probably within this framework that they obtained on August 2, 1845, at the observatory of Paris the first daguerrian image of the Sun, in 1/60th of second. The following year, with other regular collaborators from the observatory, like N.P Lerebours and Secrétan, Fizeau published *Traité de photographie*. In 1847, he appeared at the head of the list of the "most remarkable daguerreotypists" determined by Thierry in his shortened general History of photography. In 1848, *Histoire générale abrégée de la photographie* awarded him a medal for his research.

At the same time though, the essence of his work in the field of photography seemed to be complete. His last known images, from the experiments of heliographic engraving done in collaboration with Lemaître and Hurlimann, went back to 1849, and this same year, Fizeau, abruptly ended his collaboration with Foucault. Both Fizeau and Foucault conducted research on speed determination based upon opposite theories. In 1856, the Institute awarded him the prize Triennal before electing him, and four years later, he became a member of the Academy of Science, general physics. For a time he was superintendent at the Polytechnic School of Paris, and was named, in 1875, as a foreign member of the The Royal Society, London, and decorated with the Legion of Honor the same year. In 1878, he became president of the Academy of Science and entered into the prestigious Bureau of Longitudes of the Observatory of Paris. His activities within the Academy proved that his interest for photography remained wholly intact at the beginning of the years 1870. For example, he brought to life the commission formed to observe the passage of Venus in front of the Sun and was, on this occasion, one of the defenders of the use of the daguerreotype for this event. A few years later, in 1887, he supported the photographic project of creating a chart of the Sky for the international congress of astrophysics of Paris.

In 1853, Fizeau married Thérèse Valentine de Jussieu, from a famous family of botanists. Together they had two girls and a boy. Following the death of his wife in 1863, he withdrew to the Château de Venteuil à Jouarre in the Seine and Marne. It was there that he died of a cancer on September 18, 1896. Four years earlier however, several of his images had been presented in the historical section of the International exhibition of photography of Paris. To reconstruct the exact photographic production of Fizeau would be difficult today for example, an image is made up of numerous daguerreotype plates,

some having been used for engraving tests, and tests on paper. The principal subjects photographed were, in addition to some monuments of Paris and of the Normandy coast, images of the Parisian roofs, or the residence of the street of Cherche-Midi, some scientific topics (Sun, reproductions of insect), but also, a number of portraits and reproductions of objects also caught Fizeau's interest.

His images are today, in Paris' Carnavalet museum, the museum of the national Academy of arts and trades, the national Bibliothèque nationale de France and the photographic archives of the Patrimoine. It seems that a part of the files and its collection disappeared in plundering from the castle from Venteuil, which happened during the First World War. Certain manuscripts, original work, and letters however were given in 1935 to the files of the Academy of Science by M.Ramond-Gontaud, but no photographs were included. A part of his collection was put on sale in London (E.P. Goldschmhet) during the 1950s which included in particular, more than fifty of images signed by Fizeau himself, such as the dedicated specimen of *The Pencil of Nature*, and 17 original tests of Talbot. For about fifteen years, several important sets of his daguerreotypes and engraving tests were sold to Chartres (Gallery of Chartres 3.12.89; 6.10.91; 7.3.93), Paris (Drouot, 12.12.97; Sotheby' S, 16.03.2002) and London (Sotheby' S, 27.10.99).

Quentin Bajac

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FLACHÉRON, COUNT FRÉDÉRIC A. (1813–1883)

French engraver and photographer

Jean François Charles André Flachéron (called Frédéric Flachéron) was born in Lyon on 26th October 1813. His father, Louis Flachéron, was a famous architect. On 31st March 1836 Frédéric enrolled at the Royal School of Fine Arts in Paris. In 1839 he won the second Great Prize of Rome for engraving on medals and semi-precious stones, but later decided to leave for Rome. He belonged to the French artistic circle and was especially close to the painter Ingres. Flachéron took photographs of Rome from 1848 to 1853 using the calotype process. He always signed and dated his salted paper prints. In the early 1850s at the Caffè Greco he often met other well-known photographers such as Giacomo Caneva, James Anderson, Eugène Constant. In 1851 at the Great Exhibition in London he showed seven panoramic views of Rome and won a medal. In 1852 he participated in the photographic exhibition held at the Society of Arts, London. He also kept in touch with an important collector from Montpellier, Alfred Bruyas (patron of Gustave Courbet), who was in Rome in 1846 and in 1848. Bruyas collected many photographic views of Rome by Flachéron, dated from 1848 to 1852. In 1866 Flachéron went to Paris with his family and he died there on 28 June 1883.

Silvia Paoli

FLORENCE, ANTOINE HERCULES ROMUALD (1804–1879)

Draftsman, painter, and typographer

Florence was born in Nice, France on 29 February1804 but passed his childhood in Monaco. As a young man he worked as draftsman, painter, typographer and later as inventor. He went to Brazil in 1824. He worked in the trade and in printing media, before taking share with Langsdorff, forwarding as draftsman from 1825 to 1829.

Baron von Langsdorff (1773–1853) who had the position of consul-general of Russia in Brazil hired him as an illustrator and topographic draftsman for an expedition in the Amazon. Florence was on the same boot as the German painter Johann Moritz Rugendaz en de French illustrator Adrien Taunay.

In 1830, he married the Brazilian Maria Angélica de Vasconcellos and settled in Vila de São Carlos, current Campinas (near to São Paulo) where he would stay till his death on 27 March 1879. His wife died in 1850 and left him 13 children. Four years later he married the German immigrant Carolina Krug with whom he had 7 children.

From 1830 on, Florence devoted himself to his numerous projects of invention. During the Langsdorff expedition, he had developed a new system of using musical notation to record the songs of birds and vocalizations of other animals, which he named "zoophonia." In 1830, when he was searching for a simplified way of printing his more than 200 illustrations performed during the Langsdorff Expedition, other than using expensive and time-consuming engravings on wood and metal (xylography and lithography). In 1830 he invented a new process, similar to the mimeograph, which he named "polygraphia," and began using this commercially in his printing office. In 1832, with the help of a pharmacist friend, Joaquim Correa de Mello, he began to study ways of permanently fixing camera

obscura images, which he named "Photographia." He developed a technique of visual representation on paper sheets that tiny holes bored into it, creating little light reflections. The originals were then placed in front of an opening and exposed to the light of the sun, inside an obscure part. Then, the image acquired was fixed as the external images projected in this camera. In 1833, they settled on silver nitrate on paper, in a process very similar to that developed by Niépce and Daguerre. Unfortunately, partly because he never published the invention adequately, partly because he was an obscure inventor living in a remote and underveloped province, Hércules Florence was never recognized internationally as one of the inventors of photography. He wrote a letter concerning "photographie" in his newspaper at the date of January 15, 1833. Five days later, he made a report of his first experiment with the obscure room but, unfortunately, none of the further images were successful. In 1842, he launched "O Paulista" the first newspaper in the State of São Paulo—and in 1858, "Aurora Campineira," the first newspaper of Campinas. His multiple talents drew the attention of the emperor Dom Pedro II (1825–1891) who visited him in 1876. Florence also wrote several books about his expeditions which were published in 1875.

JOHAN SWINNEN

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FLOYD, WILLIAM PRYOR (active 1860s–1870s)

British photographer

Little biographical information, beyond his professional activities, is available for one of the most successful Hong Kong based photographers of the mid-1860s–70s. Floyd first appears in China in 1865, in the employment of the Shanghai photographers Shannon and Co, but by the following year he had transferred to Hong Kong to work as a photographer for Silveira and Co, whose business he acquired shortly afterwards. By 1868, trading under the business titles of both W. P. Floyd and Co. and the Victoria Photographic Gallery, he was advertising views of both Hong Kong and mainland China, but the bulk of his work was firmly based in the British colony. Contemporary reviews compare his work with John Thomson (some of whose negatives he appears to have acquired and marketed on the latter's departure in 1872) and while the range of his output was certainly more limited, he seems to have enjoyed similar commercial success. Portrait and genre studies apparently formed only a minor part of his output, which was predominantly focussed on satisfying (in the words of the *China Mail* of 8 August 1868), a 'common desire to obtain memorials of a locality in which some of the best years of our life have been passed.' A technically competent, if not unduly inspired photographer, Floyd's surviving work nevertheless provides an extremely valuable historical record of the colonial topography of Hong Kong, with a particular emphasis on the documentation of individual public and commercial buildings, clubs and European domestic architecture. Floyd left Hong Kong in 1874, his business and premises taken over by Emil Rusfeldt.

JOHN FALCONER

FLY, CAMILLUS SIDNEY (c. 1849–1901)

On October 26th 1881, a gunfight took place across the street from the studio of Camillus Samuel Fly in Tombstone Arizona. Although now known as the "Gunfight at the OK Corral," the gunfight between the Clantons and Wyatt Earp took place on some open land rather than in the corral itself. According to some eyewitness accounts, the photographer himself disarmed the wounded Billy Clanton after the gunfight was over. Fly had previously photographed Ike Clanton, Earp and Doc Holliday in his studio. His restored studio, displaying many of his images, is part of the OK Corral historical site.

Born in Missouri c. 1849, Fly moved to California as a child, and to Tombstone with his wife Mary immediately after their wedding in 1879, where they operated a photographic studio and a twelve room boarding house at 312 Freemont Street.

Fly photographed a meeting between General Crook and Geronimo and his Apache followers early in 1886, taking individual portraits of Geronimo, and groups of Indians and U.S. Cavalry. Some of his pictures were used as the basis of illustrations in *Harper's Weekly* in April 1886 (No. 1531).

The *Tombstone Epitaph*, in 1887 noted that "Mr. C.S. Fly, the well known photographer, leaves today for Florence, Phoenix and other points in the Territory" and that "during his absence, Mrs. Fly also an accomplished photographic artist, will conduct the gallery in this city as usual." Travelling in Mexico that year Camillus photographed the devastation after a major earthquake.

JOHN HANNAVY

FOCIMETER

Antoine Claudet (1797–1867) first demonstrated the Focimeter in 1849, and exhibited the instrument at the Great Exhibition in London in 1851. His Focimeter was one of three distinctively different instruments of the same name designed in the nineteenth century to perform different but associated functions. Claudet displayed the device as part of a group of instruments he had designed to enhance the predictability of the photographic process. Alongside the Focimeter, he showed his Photographometer, an early light measuring device, and the Dynactinometer which measured the relative powers of lenses. The Focimeter was developed as an aid to photographers in achieving perfect focus on the daguerreotype plate when using the achromatic lenses then currently employed in photography. In the words of the text accompanying the display of the instrument, Claudet wrote

> It is impossible to obtain well defined photographic pictures without previously ascertaining the exact position of the photogenic focus, which is easily done by taking the image of the focimeter on a photographic surface, and comparing the segments of the apparatus with the image, then on the ground glass and the photographic surface.

The narrow spectral sensitivity of the daguerreotype plate meant that chemical and optical focus did not always coincide when using optics which were not fully corrected. Alongside the instrument itself, Claudet exhibited a group of daguerreotypes demonstrating *the differences between the visual and photogenic focus and their variation*, underlining the effectiveness of the Focimeter in achieving perfect chemical focus.

The instrument consisted on a series of numbered 'flags' located radially around a short pole. The Focimeter was set up at the subject position, and the pole aligned along the axis of the taking lens. The flags were separated along the pole at fixed distances, and the camera was focussed on the central one, usually numbered '4.' The exposed and processed plate was checked to ascertain which of the flags was most precisely in focus. If flag 4 was sharpest, then a fully corrected lens was in use. If flag 4 was not the sharpest, then the difference between optical and chemical focus could be ascertained by checking the distance between flag 4 and the sharpest flag.

Michael Faraday gave the same name to a device he designed in 1860 for Trinity House—the body responsible for British lighthouses—to test the precision of lens manufacture and the accuracy of lens and lamp alignment in lighthouses. His Focimeter was made for him by William Ladd, the London-based optical instrument and microscope maker, and the device greatly increased the effectiveness of lighthouse beams.

By the end of the nineteenth century, a third device had emerged, once again being normally referred to as a 'Focimeter.' The origins of this third 'Focimeter' can be traced back to Thomas R Dallmeyer's 'Focometer' which was an optical test bench designed to ascertain lens focal length and check the extent to which aberrations had been corrected. It is unclear when 'focometer' gave way to 'focimeter' as the normally used term.

A sophistication of that device, for measuring the strength and characteristics of ophthalmic lenses, is now an established tool of the science of optics, and 'focimetry' or 'focometry' is a branch of that science.

JOHN HANNAVY

FOCUSING

Ensuring precise focus has always been one of the fundamental challenges of photography. However, the ability to focus an image on to a surface predates photography by centuries.

While the earliest descriptions of the *camera obscura*, in use since the eleventh century, did not include a means of focusing the image, by the late 18th century, the focusing camera obscura was a relatively common artist's tool. While some camera obscura designs included a limited facility to focus the lens, the majority were, like the much later 'box camera' of fixed focus construction—being focused on infinity. By the years immediately preceding the invention of photography, however, the typical camera obscura was, like the early production models of photographic cameras, of sliding-box construction with two boxes sliding, one inside the other, to enable the operator to select the required plane of focus.

On the focusing camera obscura the larger box, the camera body, normally contained the viewing screen, while a sliding lens box moved in and out of the front. With the photographic camera, however, the design was generally reversed, with the lens panel and camera body (the larger box) remaining fixed to the tripod while the rear box carrying the focusing screen and sensitive material was moved in and out to achieve precise focus. Once focus had been achieved, the two boxes were 'locked' together with a thumbscrew. That was the design adopted by Alphonse Giroux for the first production model of the daguerreotype camera in 1839, and one which dominated camera design in the early years, despite its bulk.

There were, however, several cameras in which the box carrying the lens was movable—including one of the first cameras to be fitted with a focusing scale, designed by George Smith Cundell in 1844.

In contrast, several of Henry Fox Talbot's first and smallest cameras—his 'mousetraps'—were of fixed focus designs, although others did incorporate lenses which could be focused in a sliding sleeve.

One of the first cameras to be fitted with a mechanism for assisting precise focusing—focus being adjusted by

Clifford, Charles. Courtyard of the House Known as Los Infantes. *The Metropolitan Museum of Art, Gilman Collection, Purchase, Mr. and Mrs. Hentry R. Kravis Gift, 2005 (2005.100.504.46) Image © The Metropolitan Museum of Art.*

a rack and pinion system and checked with a magnifying glass—was Voigtländer's all-metal camera design of 1840. Fitted with Petzval's remarkable f3.7 doublet lens, and taking circular daguerreotypes of 80mm diameter, this camera was, probably, the first camera to permit truly precise control over focus. The considerably reduced depth of focus afforded by the faster lens, of course, made precise focusing a much greater necessity than the smaller aperture lenses used on other, larger-bodied, contemporary cameras.

Voigtländer's rack and pinion focusing system reappeared on the Bourquin daguerreotype camera of 1845—as did Petzval's doublet portrait lens.

During the 1840s, it became normal for cameras designed for external use to be focused by simply sliding the box. For studio cameras, with their faster lenses and larger apertures, where more precise focus was desirable, the camera would first be crudely focused using the sliding box, then fine focused using either a rack and pinion adjustment on the lens barrel, or a simple helical device.

A radically different approach was that taken by Alexander S Wolcott, whose camera design eschewed the whole idea of a lens in favour of a concave mirror—a system used in generations of reflecting telescopes. The mirror, fixed inside the camera body, collected the light rays and focused them on to a small daguerreotype plate—never bigger than 1/9th plate. To achieve sharp focus, it was the plate carrier that was adjusted along a sliding track inside the camera body.

George Knight marketed a variation on the 'American Camera' in the early 1840s, the two sliding boxes being of sufficient length, when extended, to enable 1:1 focusing. Knight's catalogue described the camera as offering "great variation in the length of focus and may be used for copying daguerreotypes where the focus is required to be the same length as the object to be copied is distant from the object glass."

With the introduction of bellows in the 1850s, rack and pinion focusing along baseboard rails eventually became the norm—with some cameras offering lens panel focusing and others adjusting the focus by moving the back panel. By the 1860s, cameras appeared permitting adjustment on either standard.

The introduction of lens designs offering variable apertures—designs by Waterhouse, Quinet, Chevalier and others were introduced in the 1850s and 1860s—gave photographers hitherto impossible control over the depth of field, and thus gave them control over the plane of focus itself. It was 1886, with the introduction of Lancaster's *Rectigraph* lens of 1886, before a lens with an iris diaphragm was first widely marketed.

With the introduction of enlargers, and the progressive reduction in negative sizes towards the end of the 19th century, the establishment of precision in focusing became paramount.

Technical issues of image sharpness occupied a disproportionately large part of critical reviews of early photography—where the creation of pinpoint sharpness in all planes of the image was deemed an essential. Photographers with their blue sensitive plates initially struggled with understanding key issues about the difference between optical and chemical focus, but as the art matured, and pictorial ideas about soft focus, or selective focus, rather than sharp focus became talking points, the challenges which faced photographers expanded.

In this more mature environment, focus became something the photographer could control, adjust and

adapt to suit the artistic or creative requirements of the photograph.

One of the first to put this new approach into practice—albeit by accident according to her son—was Julia Margaret Cameron. Writing in her brief biographical manuscript *Annals of My Glass House* in 1874—of her first 'success' in photography almost a decade earlier—she recalled that "when focusing and coming to something which, to my eye, was very beautiful, I stopped there instead of screwing on the lens to the more definite focus which all other photographers insist upon."

The Cuban-born Peter Henry Emerson took matters yet further, proposing that only the central subject of the photograph should be in sharp focus, the remainder being allowed to recede into a softer focus to draw the viewer to the picture's central purpose. 'Naturalistic Photography,' as proposed by Emerson, sought to replicate the manner in which the human eye—and therefore the photographer himself—saw the scene while contemplating photographing it. "In this mingled decision and indecision, this lost and found" he wrote, "lies all the charm and mystery of nature."

JOHN HANNAVY

See also: Cameron, Julia Margaret; Cundell, George Smith and Brothers; Emerson, Peter Henry; Focimeter; Lancaster, James & Sons; and Quinet, Achille.

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FOELSCHE, PAUL HINRICH MATTHAIS (1831–1914)

Australian police inspector and amateur photographer

Foelsche was born in Germany on 30 March 1831. Shortly after migrating to Adelaide in 1854, he enlisted in the mounted police. In 1869, Foelsche was commissioned to lead a new force at Palmerston (Darwin) where he developed an enthusiasm for wet-plate photography. An avid contributor to International exhibitions, his entries received a number of awards. Foelsche retired from the police force in 1904, and died in Darwin on 31 January 1914.

Foelsche developed an enthusiasm for wet-plate photography and scientific collecting following his appointment as the Northern Territory's first police inspector in 1869. Most active between 1873 and 1896, he produced over 500 images of the colony and its Aboriginal peoples initially for International exhibitions, but later in the making of photographic albums.

His accomplishment and range extended with his change to the dry-plate process: from buildings and industry to picturesque scenes of rivers, escarpments and remote settlements. His portraiture became increasingly influenced by the new science of anthropology and is comprised of over 300 plates and accompanying records of Aboriginal people.

TIMOTHY SMITH

FONTAYNE, CHARLES H. (1814–1901)

At the Great Exhibition of 1851 at London's Crystal Palace, a panorama of the Cincinnati waterfront was exhibited. Comprising eight separate whole plate daguerreotypes, the panorama measured over five and a half feet in length, and was of a quality so high that historians have been able to identify every vessel moored along the banks. The panorama was photographed across the river from the rooftop of a building in Newport, Kentucky, by Charles H Fontayne and William Southgate Porter (qv) in September 1848.

The two photographers had resumed a partnership earlier that year, after Porter had moved from Baltimore where, from 1844 until 1846, they had operated a successful studio at 268 Baltimore Street.

Fontayne, who had first practised photography in 1841, left the Baltimore studio in early 1846, moving to Cincinnati where he worked on his own until Porter rejoined him in his studio at 30 West 4th Street.

He was working on his own by 1854, when he offered a reward in *Humphrey's Journal* for the return of stolen cameras, and in the following year he claimed to have produced the world's first life-sized photograph. By 1856 he was at Ryder's Gallery, Cleveland, Ohio.

In the 1860s he developed equipment for the large-scale production of prints, and dryers for completing the process.

Still active in the 1890s, he claimed that in the 1840s, he had been suffering from consumption, until the chemical fumes apparently cured him. He died in Clifton New Jersey in 1901, after several years of working in New York.

JOHN HANNAVY

FORBES, JAMES DAVID (1809–1868)

English physicist and glaciologist

James David Forbes was Professor of Natural Philosophy at the University of Edinburgh from 1833 to 1859

and Principal at the University of St Andrews from 1859 until his death in 1868. In 1838 he was awarded the Royal Society's Rumford medal for his discovery of the polarization of radiant heat; his later research, on glaciers, earned him the sobriquet "explorer and surveyor of the Alps."

Forbes's importance for the history of photography lies in his contacts with the inventors of the new art. On 27 February 1839, Talbot sent Forbes a "lace specimen of Photogenics," together with two pieces of prepared paper. Three months later, within the space of a few days in May, first in London and then in Paris, Forbes saw specimens of Niépce's heliographic process and examples of Daguerre's plates. Forbes was in fact one of the first British scientists to see Daguerre's photographs, and he described the experience in detail in his journal and in a letter to his sister. The day after he met Daguerre, Forbes met Isidore Niépce, who explained his father's process "circumstantially and … no doubt correctly."

GRAHAM SMITH

FORRESTER, BARON JOSEPH JAMES DE (1809–1862)

English

Joseph de Forrester was a port wine merchant, artist, antiquary, and author, who went to Portugal in 1831 to work in the port business, eventually revolutionizing the production methods. His important work in surveying the Douro River helped make it more navigable—a further aid to the wine-shipping trade. He published *Portuguese Scenery with Illustrative Notes* in 1835 and *The Portuguese Douro and the Adjacent Country and So Much of the River as Can Be Made Navigable in Spain* in 1848. He illustrated these works with his own lithographs and maps.

He became a partner in the firm Offley and de Forrester and was made a Baron by the Portuguese Government in recognition of his work in promoting the port trade with Britain.

He started making calotype views of the River Douro and the surrounding areas in the early 1850's as an aid to his survey of the river. In all he is known to have made at least 220 photographic studies.

He was a member of the Photographic Exchange Club and the Photographic Society, as well as the Society's select dining club.

He drowned in his beloved Douro river, near the Ponto do Cachuo rapids on 12th May 1862, his body was not recovered but a tombstone was erected in his memory at the Anglican church of St James at Oporto.

IAN SUMNER

FOSTER, PETER LE NEVE (1809–1879)

English barrister, mathematician, keen amateur scientist, and early photographer

Peter le Neve Foster was one of a small group of men who met informally in each other's houses from c. 1847 to share their early enthusiasm for photography. Now often referred to as the Calotype Club, the group included Peter Wickens Fry, Frederick Scott Archer, Hugh Diamond, the engineer Charles Blacker Vignoles and others.

Born in Lenwade, Norfolk, in 1809, and called to the bar in 1836, Foster subsequently met Roger Fenton, and with their shared interests in both the law and photography the two men's association lasted many years.

Foster was one of the moving forces behind the restructuring of the Royal Society of Arts in the 1840s, serving as its Secretary for 25 years. With Fenton and others, he was one of the organisers of the first exhibition of photographs held at the Society, in December 1852.

He was a founder member of the Photographic Society of London in January 1853, and served on its first Council. He would later also serve as a member of the group sent by the Society to negotiate with William Henry Fox Talbot for the relaxation of his calotype patents for amateur photographers.

JOHN HANNAVY

FOUCAULT, JEAN BERNARD LEON (1819–1868)

Jean Bernard Leon Foucault was born in Paris on September 23, 1819, son of Fortuné Foucault, editor and bookseller, and Nicole Lepetit. The family settled in Nantes and remained there until the beginning of the 1830s, then moved to Paris. In 1834, the father, suffering a mental illness, was admitted to a hospital and died in 1839. This family history partially explains why Foucault never married. His interest in science and technology was evident as a young person. As an adolescent he seemed to have built scientific toys, revealing an early a taste for instruments and scientific experiments based on scientific facts.

In Paris, Foucault was registered with the Stanislas College where he showed little enthusiasm for his studies. Due to poor health, he studied with a tutor. During this period, he became friends with another pupil of the college, Hyppolite Fizeau, with whom he invested from 1844 to 1849 the majority of his research in the field of photography and whose courses offered more than one similarity to his.

After receiving his baccalaureate, Foucault directed himself towards medicine. He wanted to become a surgeon, but his phobia of blood eliminated that initial

vocation. During this period he met professor Alfred Donné, whom he followed to the Medical school and attended microscopy courses, before becoming a professor there himself. The two men remained very close. In 1845, Foucault succeeded Donné as the scientific writer of the *Journal des Débats*.

Since 1839, Donné had an interest in the daguerreotype and its possible applications in the field of medicine. Undoubtedly under his influence, Foucault started work on the technique and, according to his biographer Cornu, "built an apparatus from his hands." With Donné, he attempted to take daguerreotypes of enlarged globules from 20 to 400 times actual size by using a solar microscope-daguerreotype. Summarizing several years of work, these images appeared in 1844 in *l'Atlas du cours de microscopie*. The edition included 80 plates based on daguerreotypes taken by Foucault, and were published in 4 successive editions. The same year, the two men presented their photoelectric microscope, used by Donné at the time of its conferences.

In parallel, in collaboration with another doctor, Doctor Belfield-Lefevre, Foucault undertook research on the sensitive layers of the daguerrean image. In August 1843, the two men spoke in front of the Academy of Science of Paris on the preparation of the sensitive layer that received the image, and again in October 1846 noting the process that made it possible to reproduce, with equal perfection, the brilliant and obscure tones of the model.

It is hard to determine with certainty the date of the beginning of Foucault's collaboration with Fizeau. In 1841, an echo of previous searches, Foucault developed one slide with bromine allowing an application of uniform bromide. However, in April 1844, Foucault and Fizeau agreed for the first time to speak in front of the Academy of Science (research on the intensity of carbon light). Until 1849, probably encouraged by Arago, they jointly continued their experiments to analyze and measure the light required and involved particularly in the phenomenon of the interferences between two rays of light and in the action of the solar spectrum on sensitized surfaces. On August 2, 1845, they obtained at the Observatory of Paris the first daguerrienne image of the Sun now known in Paris as CNAM.

Their research became more directed towards the questions of pure physics in particular, relating to the determination the speed of the light. In 1849, an estrangement between the two men put an end to their collaboration. This same year, Fizeau determined the speed of light and Foucault determined the relative speed of light in air and water. Soon after Foucault presented a photoelectric apparatus to the Academy of Science, and continued to be interested in various questions related to optics as on the first stereoscopic process.

His activity in the field of photography slowed down; however, Foucault continued his work in the field of physics. In 1851, he built his famous "pendulum" making it possible to highlight gravity. The experiment received the recognition of his peers and he became an international celebrity, starting a true "pendular fashion."

Four years later he was appointed to a recently created position at l'Observatoire de Paris, where he was responsible for the study of the sun and the construction of new instruments to observe it, and tried with little luck to develop the ability to photograph it. In 1862, he was named a regular member of the prestigious Bureau of Longitudes and a foreign member of the Royal Society, London from which he had received in 1855 the Copley medal. In 1865 finally, he was elected as a member of the Academy of Science of Paris, (section of mechanics), of Berlin. Every Thursday morning, his scientific discussion would attract off the street of Assas the national and international scientific celebrities who would discuss scientific matters in his living room.

Even if his activity as a photographer seemed to be finished, his interest in photography and questions regarding optics remained. In 1854, he became part of the founding members of the Société française de photographie and became a member of its board of directors. He remained in this position until his death in 1868. In 1860, he was sent to Spain to photograph, on behalf of the Observatory of Paris, the total solar eclipse. Two years later, he developed a heliostat for photographic enlargement, which was built by his son-in-law, the Dubosq optician. Suffering since 1861 from incurable and progressive paralysis, he died in Paris on February 11, 1868.

His photographic production now known, consisting of daguerreotypes of Paris and a still life of a bunch of grapes, is extremely small, with the exception of the scientific images concerned with the Sun and microscopy. In the public collections today, this work is mainly preserved at Paris, the Société française de photographie, and the musée du Conservatoire national des arts et Métiers.

QUENTIN BAJAC

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FOWKE, FRANCIS (1823–1865)

Captain Francis Fowke, RE, was a captain in the Royal Engineers, but is primarily remembered as an architect. He planned the International Exhibition in London in 1862 and was responsible for the original designs for, amongst other buildings, London's Albert Hall, Edinburgh's Royal Scottish Museum, and London's Natural History Museum, although that was modified and completed after Fowke's death by the eminent architect Alfred Waterhouse. Fowke also designed the first phase of London's South Kensington Museum, which evolved into the V&A.

Fowke's interest in photography brought him to use the medium to record aspects of the construction of his buildings, and images survive showing such aspects as the testing of the strength of new cement used in the construction of brick arches during the construction of the South Kensington Museum.

That interest in photography can be traced back to the early 1850s, and by 1856 he had designed and patented a novel compact folding camera for his own use. The camera was used by several military, and government-employed, photographers. It was later manufactured and marketed by Ottewill as an ideal instrument for the travelling photographer, due to its ability to be collapsed into a very compact form. Built of teak, the solid wooden design, however, was superseded by Kinnear's lightweight design using folding bellows.

JOHN HANANVY

FOX, EDWARD (1823–C. 1899)

British landscape and architectural photographer

Fox was born, probably in London or Sussex, England in 1823. He was the eldest of four brothers. His mother, Sarah, was a milliner. His father, also named Edward, was a painter and printmaker of picturesque landscapes who specialised in views of Brighton and its surrounding topography. Edward Fox senior exhibited paintings frequently at the Royal Academy from 1813, and at the British Institution from 1820, until the early 1850s. The young Edward followed his father in the arts and is listed in the 1851 census at the family address in Middlesex Street, St. Ann's, Sussex, as a "decorative painter." However, by 1861 the census lists him in Brighton as an "artist-designer, photographer." His earliest known photographs are calotypes dating from around 1856.

Fox took as subjects many of the local scenes of Brighton and the outlying villages, towns and landscapes painted by his father. In Brighton he photographed the street scenes, fishing boats and fisher-folk on the beach, shops, civic buildings, hotels, churches, the Theatre Royal and the Royal Pavilion. These images constitute the earliest comprehensive photographic survey of the town and are important historical documents. He also made many calotypes of a picturesque character in Sussex localities such as Mayfield, Bramber, Shoreham, Ditchling, Preston, Battle, Rottingdean and Chichester. Up until around 1860 he printed on albumen paper from calotype negatives and thereafter began using wet collodion on glass negatives. He used various sized negatives ranging from 12.7 × 10 cm (5 × 4 in); 17.8 × 22.8 cm (7 × 9 in); 21.6 × 28 .5 (8.5 × 11.25 in) and 16.5 × 19 cm (6.5 × 7.5 in). A series of views of Brighton's Marine Parade, King's Road and beach exist trimmed to a panoramic format.

Sometime in the early 1860s he set up a photographic business at 44 Market Street, Brighton from where he promoted himself as a "Landscape and Architectural Photographer" as the stamp on some of his prints shows. He registered the copyright of many of his photographs from 1862. Some of these are reproductions of paintings. However his commercial activity encompassed work of a primarily documentary nature of local interest and also artistic photography. Some of Fox's architectural photographs appear to document the recent completion of buildings. It is possible that these were made as sources for engravings or lithographs in the architectural press. An auction announcement for the sale of the villa and gardens of Queen's Park estate Brighton, 1863, is illustrated with lithographs credited as from photographs by Fox (V&A Photography Collection files). He also issued stereographs and topographical cartes-de-viste. These reveal his eye for newsworthy subjects. In 1860 he photographed the beached hull of the French brig *Atlantique* of Nantes which was wrecked off the Albion Hotel, Brighton. At the marriage of the Prince of Wales in 1863 he documented Brighton's Market Street decked out with bunting. Fox must have hoped that these and other subjects, in accessible stereograph and carte-de-visite formats, would have a wide commercial and local appeal. Presumably he sold many copies but very few examples have since come to light.

Fox's more artistic intentions are shown in what appears to be a personal album (private collection, London) made around 1864. It shows the village of Mayfield, its half-timbered buildings, the ruins of the archbishop's palace and scenes of haymaking, evocatively inscribed "E. Fox. Studies of Effect." His ambitions of this kind were captured most fully in his "instantaneous photographs" of sea and sky made in an oval format in 1865. Gustave Le Gray had pioneered the notion and image of the instantaneous photographic seascape during the mid-1850s in France yet few British photographers met the challenge as well as Fox. It is likely Fox's seascapes that were shown at the Photographic Society Exhibition in November 1869 and described by the *Photographic Journal* (vol. XIV, 172) as "Foreground and Cloud studies."

Perhaps Fox's most significant contribution to art was his systematic study of trees published as: *The Anatomy of Foliage. Photographed examples of the principal forest trees, each taken from the same point of view in winter and in summer; enabling the student to trace the limbs when hidden by the masses of foliage. Arranged by Thomas Hatton. Photographed by Edward Fox*. The set was issued from 1865 to 1866 in eight monthly parts each containing one pair of plates. The sixteen photographs consist of eight pairs of trees: *The Oak, from Friar's Oak, Clayton Sussex; The Elm, from St. John's Common, Sussex; The Sycamore, from the Valley of Preston near Brighton; The Horse-Chestnut, from the Rectory, Clayton, Sussex; The Spanish-Chestnut, from Buxted Park, Sussex; The Beech; The Ash* and *The Lime*.

The *Brighton Gazette* (23 November 1865) noted in its perceptive review of *The Anatomy of Foliage*:

> The principle puzzle in sketching trees from nature was *what to leave out* … Now here the photographic art has the advantage. The photograph *leaves out nothing*. It gives at once multiplicity and mass: it shows the general distribution of light and shade without losing detail. It is true that hitherto photographs of trees have not been satisfactory. From the tremulous character of the sprays … the clearness of the foliage has been lost and a black, unmeaning mass has often been the rendering of the most beautiful and delicate tracery. But the art advances. Our townsman, Mr. Fox, has done wonders … And in the summer just gone by the same enchanter has compelled the monarchs of the forest to stand before his magic lens and deliver up their treasures.

The work was deemed exemplary for students for "the details, if examined with a lens, are of the most minute description, showing the very veins in the leaves of the horse chestnut and the spine on its fruit." The review went on to record "the fact that the work is in use at the Government School of Art at South Kensington is an evidence of the estimation in which it is held by some of the highest authorities in the kingdom." The Department of Science and Art purchased two copies in October 1865 for £3.0.0 from Hatton who sold the prints for Fox from his premises at 3 Ship Street, Brighton. As well as being invaluable documents for the draftsman the photographs were also exhibited and praised in their own right. They were shown at the soirée of the Photographic Society of London, King's College, in June 1866 as studies of trees, "in and out of leaf" (*Photographic Journal* vol. XI, 67).

Fox participated in a number of the exhibitions of the Photographic Society of London, showing mainly views of Brighton and its surroundings, in 1863, 1864, 1876, 1877, 1878 and lastly in 1880. By the 1890s his photographic activity appears to have stopped. On 4 June, 1892 he placed a notice in the *Brighton Herald*: "Mr. E. Fox, Artist & Landscape Photographer (Late of 44 Market-street), has removed to 15 Havelock Road, Preston Park, where he respectfully solicits a Visit from his old Friends and others to inspect his collection of oil paintings and original photographs, which he is desirous of disposing of at exceptionally low prices. On view from 10 to 5 daily." At the age of seventy-nine, Fox was clearly taking stock. The exact date of his death is not known.

Martin Barnes

Biography

Fox was born, probably in London or Brighton, England in 1823. His father, also named Edward, was an artist who specialised in views of Brighton and its surrounding topography. The young Edward followed his father in the arts and is listed in the 1851 as a "decorative painter." His earliest known photographs are calotypes dating from around 1856. Fox took as subjects many of the local scenes of Brighton and the outlying villages, towns and landscapes painted by his father. Around 1860 he began using wet collodion on glass negatives and set up a photographic business at 44 Market Street, Brighton where he promoted himself as a "Landscape and Architectural Photographer." His commercial activity also encompassed local views of a documentary and topographical nature which he issued as stereographs and cartes-de-vistes. In 1865 he made "instantaneous photographs" of sea and sky in an oval format. Between 1865 and 1866 he issued *The Anatomy of Foliage*, pairs of photographs of trees taken from the same vantage point in summer and winter. These were devised as aids for students of drawing and were used by the government school of art.

See also: Architecture; and Carte-de-Visite.

Further Reading

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The *Brighton Gazette* (23 November 1865) review of *The Anatomy of Foliage.*

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V&A Photography Collection files.

FRANCE

Photography began in France as early as 1816 when Nicéphore Niépce, wrote to his brother Claude, about his success of fixing on white paper images of his garden's aviary. That was, as he himself said, still a defective process of which no prints remain. The objects appeared

Le Gray, Gustave and Auguste Mestral. The Ramparts of Carcassonne. *The Metropolitan Museum of Art, Gilman Collection, Purchase, Harriette and Noel Levine Gift, 2005 (2005.100.34) Image © The Metropolitan Museum of Art.*

white on a dark background. Nevertheless Niépce wrote, underlining his faith in his research that, "something could be changed in the way of arranging colors." Using the *camera obscura*, he made in his text a direct parallel with engraving and painting and even used the word "picture" [tableau] to characterize his first trial. After many tests made between 1816 and 1824 he obtained on metal and stone the first images from his house's window, which he called *héliographie*s (*The View from Le Gras Window*, 1827, Austin, University of Texas). Jacques Louis Mandé Daguerre heard, possibly from the optician Chevalier, of Niépce's trials. Daguerre, a skillful stage designer, and successful inventor of the *diorama*, had been trying for some years to stabilize images that became visible within the *camera obscura*. Perhaps because of the many differences between them, they didn't work cooperatively earlier with each other as Niépce thought Daguerre suspicious, however the two men began a venture in 1827. Unlike Niépce who was in search for reproducibility and whose model was engraving, Daguerre was keen to achieve precision and clarity. The quest for a precise print remained his *motto* after Niépce's death in 1833; he conducted their first researches alone at first, and then after 1836 with the young architect Eugène Hubert. Daguerre's work remained quite hidden despite rumors within artistic circles.

In 1838, he sought support for his new invention and started to show his first images made on silvered copper plates made sensitive to light after exposed to iodine salts. Daguerre called these images "daguerreotypes." He quickly gained the support of François Arago, a physicist, and member of the French Academy of Science and delegate to the Chamber of Deputies. Daguerre's prints raised Arago's enthusiasm, saying "Mister Daguerre's invention offers a great interest for its newness, its artistic usefulness, the rapidity of its execution and for its valuable resources that will soon be borrowed by science (...)" (François Arago, *Report to the French Chamber of Deputies,* July, the 3rd, 1839). Arago's first announcement of *daguerréotype* at the French Academy of Science the 7th of January 1839 remains the official birthdate of photography in France as in the rest of the world. By revealing his discovery on this day, he preceded England's William Fox Talbot who was carrying on his own experiments on paper.

Nevertheless such an announcement within the scientific circle had long lasting effects on France's photographic reception. Even though some months later (the 19th of August 1839) Arago made a thorough presentation of daguerreotype in front of the two French Academies—one of Science and the other of Fine Arts—the latter maintained some distrust toward photography.

Despite Daguerre himself belonging to mainly just artistic circles and Niépce to none, daguerreotypes and later negative/positive photography were considered scientific inventions, both under political, psychological and aesthetic matters. It had been disclosed by a physicist that Arago and Daguerre simplified Daguerre's process as much as possible for other users and in doing so reduced the operator's involvement. "Images came by themselves in the *camera obscura*" wrote Daguerre in 1838. Such a statement could not have been worse in a society where artistic achievement was based upon the artist's mind and not his hand. Photography had become almost mechanical. Last but not least the precision of the daguerreotype eliminated the need for

most scholars. The clear metallic plate succeeded in reproducing every detail. Enhancing both the main and unwanted details of the subject went against the pictorial theory of sacrifice. A long story of uncomfortable relationships between artistic institutions and photography had then been opened. Photographers had to wait until 1859 to see their works be shown at the perimeter of the official Salon in Paris. Meaningfully, photographs have been admitted into the French Academy of Fine Arts since only 2006.

Indeed such an opinion was not shared by everyone and did not prevent the new invention from developing quickly in France thanks to its wide-spread availability since Daguerre and Isidore Niépce were funded by the French State for their invention. At the beginning of the 1840s, daguerreotypists opened studios in Paris (around ten in 1841, mostly in the Palais Royal area) and in the major cities of Camille Dolard in Lyon, Desmonts in Marseille, Finck in Strasbourg. Some Academics even showed their interest in photography. If Paul Delaroche's too famous sentence is not true ("From now painting is dead!"), then his opinion toward daguerreotype was indulgent, if not enthusiastic. As Arago reported: " Line's accuracy,," Mister Delaroche said, "and form's precision are as consistent as it could be thanks to Mr. Daguerre 'drawings' [*dessins*] (...) Painters found in the new process a quick way to create a whole collection of sketches they could not get otherwise without time and patience" (Arago, op. cit.).

In September 1839 Horace Vernet and Frédéric Goupil-Fesquet sailed to Egypt; the optician Lerebours had given a camera and daguerrian products to Fesquet. Unfortunately all the plates he made are lost today. From 1842, Lerebours published in two volumes *Les Excursions daguerriennes* [*The Daguerrian Excursions*] with plates engraved from daguerreotypes. Arago's dream, to reproduce accurately all the world's marvels, came almost to life just few a years after his announcing his plan. Jules Itier, Joseph Philibert Girault de Prangey, and the Baron Jean-Baptiste Gros were among the passionate amateurs who practiced daguerreotype and made beautiful plates on their trips to China and around the Mediterranean Sea. Stanislas Ratel and Louis Choiselat traveled the South of France in the mid-1840s. Durig their traveling they took outstanding panoramic views of cities and countryside. Their panorama of Toulon Harbor made of five daguerreotypes was the first photograph made of famous roads.

Daguerre's acknowledgment by the French State established the daguerreotype as the first photographic process and left the other researches in the shadows. Hippolyte Bayard showed his first direct positives on paper to Arago in May 1839. The faithful Daguerre's supporter seemed to have ignored them. In July Bayard took part in a charity show in favor of Martinique. After seeing Bayard's tests Raoul-Rochette, secretary of the French Academy of Fine Arts, was far more enthusiastic in his support of Daguerre's invention: "Mister Bayard's drawings look like old masters drawings, beautifully used by time." (Désiré Raoul-Rochette, "Académie Royale des beaux-arts, rapport sur les dessins produits par le procédé de M.Bayard" ["Royal Fine Arts Academy, Report on drawings made thanks to Mr. Bayard's process"], *Le Moniteur universel,* November, 13th. 1839, 2009–2010).

An important factor in developing images was paper smoothness, which appealed to Academicians. They were also attracted to an image built upon light and shade. Bayard himself, Humbert de Molard, Blanquart-Evrard researched on paper during the 1840s. The latter managed to perfect Talbot's process around 1844. Blanquart-Evrard's own calotype formula spread in France from 1847 among artistic circles. Artists were drawn to the process for its closeness to engraving, thanks particularly to image reproduction. Several painters from Paul Delaroche's studio—Gustave Le Gray, Charles Nègre, Henri Le Secq—were among first adepts. Le Gray played a central role in the diffusion of photography among Parisian artistic circles. Many of the first French calotypists had been his pupils in his Barrière de Clichy's studio from 1849–1850, like Maxime du Camp, Joseph Viguier, and Alexis Lagrange. Léon de Laborde, an archeologist, and curator for sculpture at the Muse du Louvre, had also been his pupil. Impressed by the quality of prints Le Gray showed at the 1849 *Exposition des Produits de l'Art et de l'Industrie* [*Industrial and Fine Arts Products Exhibition*], de Laborde had been one of his active supporters among cultural circles. In Sèvres, in the West suburb of Paris, Victor Regnault—director of the French China Manufacture—and Louis Robert—head of painting studios—led one of the most active and creative groups working on photography during the Second Empire.

In 1851 the first photographic institution was born. The precise role of the Société héliographique [The Heliographic Society] was not easy to define. Nevertheless the association which gathered painters (Eugène Delacroix, Jules Ziegler), architect (César Daly), critics (Champfleury, Francis Wey, Léon de Laborde) and photographers (Gustave Le Gray, Henri Le Secq, Charles Nègre, Maxime du Camp, Edouard Baldus, for instance) played a central part in the recognition of photography (André Gunthert, "Le roman de la Société héliographique" ["The Heliographic Society novel"] in *Etudes photographiques,* no. 12, November 2002, 37–64). The Société heliographique had been founded around Bayard and Le Gray to promote paper photography and its aesthetic in front of daguerreotype, which was still the leading process at that time, both in industrial and critical terms. The active part of the

association did not last more than six or seven months. Its publication *La Lumière*—first issued on February 9th, 1851—played a crucial part in promoting paper photography as well as its models and aesthetic qualities in common with painting, architecture and sculpture until the end of the 1850s when the publication ended long after the dissolution of the Society.

The year of 1851 was also key in terms of international acknowledgment for French photography. The first World Exhibition in London within the impressive Paxton Crystal Palace had been one of the major international events of mid-19th century. It gave photography a place to be shown in conjunction with paintings, sculptures and architecture, and for photographers one of the first opportunities to publicly exhibit their skills and gifts. Many daguerreotypes had been shown from different countries. The show emphasized the quality achieved by the first photographic processes and French calotypists illustrated how well they improved Fox Talbot's invention.

Blanquart-Evrard opened his photographic printshop that same year in Loos-les-Lille. Between 1851 and 1855, he published more than twenty portfolios gathering salted paper prints such like *L'Album de l'Artiste et de l'Amateur, Etudes d'après nature, L'Art religieux.* Many famous French and Belgian calotypists worked for him: Hippolyte Bayard himself, Charles Marville, Henri Le Secq, and Victor Regnault for instance. In 1852, *Egypte, Nubie, Palestine et Syrie* [*Egypt, Nubia, Palestin and Syria*] was the first book with photographic illustrations which included Maxime du Camp's photographs taken in 1849 and 1850 during his trip with Gustave Flaubert. Despite the aesthetic qualities of Blanquart-Evrard's images, the factory closed in 1855, only four years after its opening. The cost of fabrication—the overall process involving the participation of many skilled workers—was high and well above engraving costs. Additionally, in spite of the care given to print photographs nothing could be done to prevent the salt paper prints from fading with time.

France's largest photographic exhibition during this time took place in 1855 within the Exposition Universelle, Paris.' Organized by the Société française de photographie [the French Photographic Society] this event was not considered a part of high art, and as such had not been permitted for inclusion in the Fine Arts division and instead was categorized as an Industrial device. Founded in 1854 the Société française de photographie gathered many members of the Société héliographique. Victor Regnault was honorary President, Eugène Durieu was the first President until 1858. A periodical *Bulletin* was issued and it reported on photographic events but also on the association's activities. General assemblies as well as Board meetings proved to be central places for French and Foreign photographers to show their work or to present their technical innovations. The key role played by Alphonse Davanne when he became President in 1867, as he enhanced the association involvement in scientific, economical and political circles. In 1859 the fourth exhibition of the Société française de photographie was permitted within the rooms of the Annual Salonfor the first time.

Portraiture still remained the main photographic subject and the core of French photographic industry. In his rue Saint-Lazare studio Nadar welcomed between 1854 and 1860 most of the major artists of his time. Thanks to his acute judgement, and the attention he gave to his sitters, he made sensitive portraits where psychological likeness supported by physical likenesses. At the end of the Second Empire more than 1200 photographers were registered in Paris. Photographers' studios gathered enough tables, chairs, tools, and toys to furnish a large Parisian flats. These studios typically had wide windows to let as much light in as much as possible for better photographs. The wooden walls of the studio were often painted to create the illusion of varied landscapes of gardens, forests, and seasides behind the sitter. Beside the *bric-a-brac* stood Nadar in his commercial boulevard des Capucines studio where all the walls were red as were the furniture and even the photographer's clothes. In 1850s the invention of the *carte de visite* boosted portraiture business. Celebrities' portraits were sold to be kept in albums. Such an economical success lured many people. During those years photographers careers went up and down with financial success often being followed by bankruptcy. Gustave Le Gray, Mayer and Pierson, and Nadar met financial difficulties and closed their Parisian studios for a while, or even permanently. Furthermore, after years of success where the many in high Parisian society had came to sit for photographs in his studio, Disdéri died destitute at the end of the 1880s.

Since the end of the 1840s many improvements had been made to photographic technical process. The waxed paper negative devised by Gustave Le Gray gave the print both density and precision. By the mid-fifties the collodion glass negative invented by Frederick Scott Archer was used by most French photographers for the short exposure times it allowed and the quality of the final print. As early as 1839 the new invention raised many dreams reinforced by Arago's public announcement. Photography appeared as the ideal way of reproducing the whole world and its marvels. It seemed to be the most efficient assistant to scientific research as well. French photographer's ability combined with their connections to both artistic and scientific circles made this almost true. In 1851 the French *Commission des Monuments historiques*, founded in 1837, hired five photographers—Gustave Le Gray, Auguste Mestral, Edouard Baldus, Henri Le Secq and Hippolyte

Bayard—to make the first photographic inventory. *La Mission héliographique* was born within the Société héliographique; the five photographers as well as Léon de Laborde, one of the most influential members of the Historical Monuments administration, were all members. At the end of the 1830s Prosper Mérimée traveled throughout French territories and documented monuments needing restoration and photography provided best illustrative accuracy. The aesthetic qualities of these prints were outstanding. The French Administration did not publish the prints it ordered. They have been kept in the files gathered on each building for the Historical Monuments architects which roused Francis Wey's indignation. *La Lumière* critic as well as most members of the Heliographic Society had seen La *Mission héliographique* demonstrate French mastery of the paper negative and regretted that these images had not been shown as a whole. Nevertheless the five photographers were free to sell the prints they had kept after having fulfilled the *Commission des Monuments historiques* request.

Several other architectural recordings were requested of photographers during the Second Empire. Between 1854 and 1857 Edouard Baldus followed the Louvre reconstruction by Hector Lefuel. In the 1860s the city of Paris hired Charles Marville to photograph the transformations of Paris in the same way the city of Marseille commissioned Adolphe Terris. The young New Opera architect, Charles Garnier asked Hyacinthe César Delmaet and Louis Emile Durandelle to produce images all the building stages. Afterwards, their photographs were been published in albums designed by the architect to promote his work.

In spite of scientists' enthusiasm, scientific photography remained sparse during the Second Empire. In 1868 two doctors—Hardy and Montméja—from the Saint Louis hospital in Paris published the *Clinique photographique de l'hôpital Saint-Louis*, which contained their own research on skin diseases. From this, a photographic studio was opened within the hospital. The most outstanding medical photographic testimony was Duchenne de Boulogne's publication *Mécanisme de la physiologie* (1852–1856). Thanks to the photographic illustrations, he realized a nomenclature of facial muscles which directly corresponded with the emotional expressions they caused. The success of this work had been influenced both by the quest of scientific objectivity and by the aesthetic heritage of Charles Le Brun's *Traité des Passions* creating another use for photography for both scientists and artists.

Although photography's reception within the French Fine Arts Academy remained unenthusiastic, photographers as soon as the mid-1840s, started working with models. Nude photographs—*Etudes d'après nature*—underline the high art/low art relationship between the Fine Arts and the new invention. Most of the nude daguerreotypes belonged in erotic or even pornographic genres, nevertheless, some academic nude daguerreotypes had certainly been artistically made. These photographers imitated academic poses and deliberately eliminated or minimized eroticism. The line between erotic photography and academic studies remained difficult to establish and to avoid any trouble with the strict legislation on *images galantes* circulation photographers started in 1852 to register their works at the Imperial Library as studies for artists. The first to do so was Jacques Antoine Moulin who had run into legal trouble because of these types of images in 1850. Poses were closed to academics only and imitated *Venus, Danae, Susan,* or nymphs. The woman usually stood or reclined and was obviously not the ideal feminine reconstruction the Academy desired. The model was the only woman and after coming into the studio, took off her clothes which were deliberately shown on the photograph—and posed in front of the camera. The confusion many critics of the time felt when looking at nude photographs came from the twofold faithfulness to *Le Beau idéal* and to realism.

Photography was not allowed at the *Ecole des beaux-arts* until the end of the 19th century when Paul Richer was appointed as anatomy and morphology professor. Nevertheless many photographers—among them Moulin, Julien Vallou de Villeneuve, Louis Camille d'Olivier, Auguste Belloc—sold nude studies to artists. Some even claimed as Gaudenzio Marconi did to be *Photographe officiel de l'Ecole des beaux-arts*. Several photographers like Jean-Louis Igout for instance offered catalogs of poses to artists with both male and female models.

Etudes d'après nature included landscapes, rural scenes and seascapes. Constant Alexandre Famin made many countryside views showing animals, farmers, and wooden houses. Charles Aubry designed in the 1860s beautiful images of fruits and flowers to serve as models for La Manufarcture des Gobelins craftsmen. Since 1877, Adolphe Giraudon sold studies where women posed as gleaners, goose keepers, shepherdesses. He also offered photographic reproductions of works of art. Art reproduction was one of the very first subjects of photography in France. Nicéphore Niépce made some engraving reproductions in the 1820s and the first of Bayard's direct positive prints showed sculptures in his studio. At the beginning of the 1850s when paper photography took over, daguerreotype art reproduction was one of the main challenges for photographers. To demonstrate the photographic ability to copy paintings was the way of gaining a place among fine arts. In 1851 Francis Wey underlined photography's accuracy compared to engraving interpretation. Photographic reproduction of paintings was not easy to achieve. The need for strong and uniform light was difficult to achieve

as was the need to reproduce faithfully, if not the colors, then at least the tones. Indeed if the collodion glass negative enabled blue tones to show, some colors such as red and yellow would not as easily be seen. Robert Jefferson Bingham—the British photographer of the 1851 Great Exhibition in London—came to Paris in 1855 and settled there. He became one of the most talented photographers in France for fine arts reproduction. In 1858 he made reproductions of Paul Delaroche paintings for the first *catalogue raisonné* ever illustrated by photographs, which was published by Goupil. Once a lithograph and engraving dealer, Adolphe Goupil started to print and sell photographs at the beginning of the 1850s. One of his first publications was in 1853, and was Benjamin Delessert's photographs of Raimondi engravings. By the end of 1884, Goupil's *Galerie photographique* had reached 1759 entries. Adolphe Braun, an Alsatian photographer who made photographs of fruits and flowers for his hometown's textile industry, also turned to art reproduction. At the end of the 1860s he successfully used carbon prints to copy the huge Michel Angelo paintings of the Sixtine. French museum curators' attitude toward photographic reproductions was not keen. Many of them were reluctant to move the works they kept. They saw photographic products—glasses, wet collodion—as dangerous and dirty for pictures sake. In 1866 Nieuwerkerke then *Surintendant des Beaux-Arts* forbade the Louvre entrance to exhibit any photographs. Charles Marville managed to escape the interdiction and even took unofficially the title of *Photographe du Musée du Louvre.* One had to wait until December 1883 to see a contract signed between the Fine Arts administration and the Braun company, who was given the project of photographicly reproducing works of the Louvre collections for thirty years.

There had been no formal aesthetic inventions during the 1870s. Improvements had not been made in terms of genre but to support photographic industrialization and development. Among them finding a way of fixing images had been crucial for printers and publishers since the 1850s. Photomechanical process had been mostly chosen and used. Charles Nègre and Edouard Baldus devised their own methods around 1850 and Nègre saw in the photographic engraving "the essential complement for photography." In 1857 the Duc de Luynes set up a competition within the Société française de photographie to find the best way of fixing photographs. Alphonse Poitevin won with his carbon prints. Most of the photomechanical processes designed after 1865 were modeled after his invention. The replacement of photographic prints by photomechanical images caused higher print numbers and reduced publication costs. Goupil adapted the woodburytype designed in 1865 calling this *photoglyptie* and used it despite its complexity. The collotype, invented by Albert in 1868 however was easier to handle and was mostly chosen by photographers after 1870.

Reproducing colors had been one of the first challenges for photographers since it was invented. Despite their commercial success most critics were reluctant toward hand-colored daguerreotypes or paper photographs. In 1862 Louis Ducos du Hauron started to work on a camera which allowed color photography. Six years later he licensed his invention, which positioned three different images made from colored filters and papers. At the same time Charles Cros conceived of a process similar to Ducos du Hauron's. Thanks to his theory on color addition the final image was made by superimposing three negatives of blue, orange, and green. Both techniques did not find at their time commercial developments. Additionally years later, Lumière's autochromes had been found in color. In 1878, Dalloz published the first book illustrated with colored photographs *Le Trésor artistique de la France*. Léon Vidal made photographs of the works of art kept in the Gallery of Apollo in the Louvre and used his *photochromie*, based on chromolithography and woodburytype.

Reduction of time exposure enabled photographers to reveal a still hidden world to human eyes. As the astronomer Pierre Jules Janssen observed, photography had then became a valuable asset to scientists. It became, he wrote, "the scientist's retina." In 1874 he designed a photographic revolver that allowed the reproduction of the different stages of the transit of Venus'. Astonishingly he used daguerreotypes and not collodion to do so. He chose this then forgotten technique for the precise images it took.

The main innovation of the end of the century was not French but its use deeply changed photographic uses and habits in France. In 1871, the Englishman Richard Leach Maddox invented the gelatin dry plate silver bromide process. Improved by Désiré Van Mockhoven in Belgium, the new technique quickly took over in France during the 1880s. The reduction of time exposure being less than one tenth of a second, allowed photographers to take on new subjects. Fixated on motion, photographers took images of waves, horses galloping, running trains, and steaming ships. Charles Grassin made several photographs of waves and ships in the Boulogne harbor in 1882. It has been said that his photograph of the steamer Folkestone leaving Boulogne had an exposure below 1/82th of a second. Louis-Jean Delton photographed horses races in Auteuil and Muybridge's work on animal locomotion drew high interest in France when they were published in 1878 in *La Nature*. Jules-Etienne Marey devoted his life to movement analysis and gave up traditional anatomical studies of the dissection of dead bodies' for research to help the living. Inspired by Muybridge's process he conceived his own photographic device to observe movement, chronopho-

tography. Within the *Station physiologique* he opened in Auteuil he designed not only a photographic process (based first on glass negatives then on celluloid films) but also a complex and ingenious laboratory where every attempt was made to avoid any distortion of observation. His works raised French artists' interest and although a doctor himself, his aim being scientific, he nevertheless always had been keen on artistic representations. A soon as 1873 he wrote *La Machine animale*. In 1878 he gave a lecture *where* he pointed out how unrealistic representation of horses pace by painters and sculptors had been until then. He published in 1893 the *Album de physiologie artistique, n°1, des mouvements de l'homme*. If Edgar Degas chose to keep a traditional representation of movement in his paintings, his sculptures of dancers and horses showed an interest for movement analysis close to Marey's experiment. In 1882 Albert Londe created the photographic department within the Parisian hospital of La Salpêtrière. From 1888 his images reproducing Charcot's work on hysteria were published in *Nouvelle iconographie de la Salpêtrière.* This medical photography marked another use for photography and union between science and photography.

Instantaneous images did not go move beyond to show a moving world. Although they depicted previously unseen stationary images, they failed to reproduce movement. Snapshots showed human beings, vessels, trains and waves as if they were stopped. As André Gunthert wrote: "Instantaneous fixed an index of surprise and accident." Commercialization of the Kodak Pocket camera from 1888 enlarged such an index. Its low price and its easy handiness gave many people the chance of buying and using it. Millions of every day life incidents and surprises had been reproduced: kids' games, jumps, falls, dives, and even hide-and-seek parties. Photography had entered thousands of people's livese.

Maurice Guibert, a close friend to Henri de Toulouse-Lautrec, joined an association of amateur photographers, *La Société des excursionnistes photographes.* His photographs showed friendly groups of men laughing, joking and teasing. Pierre Bonnard and Edouard Vuillard both used the Kodak Pocket as well. Bonnard's photographs show the happy and noisy games of his sister's kids in the family's house. All hi simages were not of simple daily events, and around 1900, he took several nude photographs of Marthe, who became his wife some years later. Bonnard's photographs often raised emotions and relayed the intimacy between the photographer and his model, which is enhanced by his painter's sense of composition and light. He also took more photographs of Marthe in his garden at Montval. Bonnard kept her movements beautiful and poses freedom. She walked from sunlight to shadow, at ease within nature as a nymph.

Edouard Vuillard photographs are closely related to both his work and his life as well. The painter called himself "a day-to-day life explorer." For most of his life, he painted family and friends often with an outstanding acuteness of judgment. His Nabis paintings made in the 1890s are deeply influenced by his stage sets and by his familiarity to Ibsen or Maeterlinck plays. His choice for unbalanced compositions, his taste for decorative panels and the way he emphasizes how uneasy communication is between people underlay his photographs as well. He bought his camera in 1897 and kept photographing until the 1930s. He often mentioned photography in his diary. More than just images of games and incidents, his photographs show long lasting attitudes and links between people. His photographic work echoes his painting.

Edgar Degas' photographs can not be related to snapshot aesthetics. It has often been written that as a photographer he composed still, almost severe yet strongly enlightened images. His photographic practice only lasted some months around 1895 as he was already quite old with a long career behind him. The images, however all show his close friends—Stéphane Mallarmé, Auguste Renoir, the Rouart and Lerolle families. Degas obliged his models to long poses. His prints were under his control enlarged by Guillaume Tasset who designed contrasting images.

Aside from painter's photography, pictorialism developed in France at the end of the century. Pictorialism was born among amateur circles. The Parisian *Photo Club* gathered from 1890 consisting of Constant Puyo, Robert Demachy, Hachette, de Singly. In 1894 they organized rue des Mathurins in Paris, the first *Exposition d'art photographique.* They claimed that photography should be recognized as an art; however they still used techniques mainly taken from painting and drawing. Pictoralists chose to show a world far away from modern life's agitation and as such they could be compared to symbolist artists. In 1899 Robert de la Sizeranne published his manifesto *La Photographie est-elle un art?* ("Is Photography an Art?"). In 1903 Puyo launched *La Revue de photographie* where the photographs shown in the Photo Club exhibitions were published. Photo Club members kept close relationships with pictorialist photographers abroad and participated in foreign exhibitions and publications.

Eugène Atget has been, seen since Berenice Abbott discovered the man and his photographs in the 1920s, the French forerunner of "pure photography." Surrealists, Man Ray at first, is also highly praised his images. Atget was born in Libourne and came to Paris in 1878. After having tried to work in theaters as a painter he settled as professional photographer in 1890. On his door was written: *Documents pour artistes*. Some years later he started his systematic survey of Parisian streets and buildings. He sold his photographs to public institutions like the Bibliothèque nationale, Musée

Carnavalet as early as 1898, at that time purchasing them for documentary purposes. Atget's photographs reveal an old Paris where shops and boutiques have today disappeared.

December 28th, 1895, saw a new invention which was offered to Parisians on boulevard des Capucines, in the Indian salon of the Café de Paris. Auguste and Louis Lumière, manufacturers from Lyon, showed ten short moving stories on a white screen, among them *L'Entrée en gare de la Ciotat, La Sortie d'usine* or *Le Déjeuner de bébé*. Almost sixty years after Daguerre's invention the Lumière brothers succeeded, as had Marey some years before, in reproducing movement.

DOMINIQUE DE FONT-RÉAULX

See also: Arago, François Jean Dominique; Atget, Jean-Eugène-Auguste; Baudelaire, Charles; Bayard, Hippolyte; Baldus, Édouard; Bibliothèque Nationale; Blanquart-Evrard, Louis-Désiré; Braun, Adolphe; Choiselat, Marie-Charles-Isidore and Ratel, Stanislas; Daguerre, Louis-Jacques-Mandé; Daguerreotype; Davanne, Louis-Alphonse; Degas, Edgar; Demachy, (Léon) Robert; Duchenne, Guillaume-Benjamin-Amant ; Ducos du Hauron, André Louis; Durandelle, Louis-Emile; Durieu, Jean-Louis-Marie-Eugène; Expositions Universelle, Paris (1854, 1855, 1867 etc.); Girault de Prangey, Joseph-Philibert; Goupil et Cie; Gros, Baron Jean-Baptiste Louis; Itier, Jules; Le Gray, Gustave; Le Secq, Henri; Lumière, Auguste and Louis; Marey, Etienne Jules; Marville, Charles; Mayer et Pierson; Mestral, O.; Moulin; Nadar; Nègre, Charles; Niépce, Joseph Nicéphore; Régnault, Henri-Victor; Photo-Club de Paris; Puyo, Émile Joachim Constant; Robert, Louis-Rémy; Tournachon, Adrien; Vallou de Villeneuve, Julien; Vidal, Léon; and Wey, Francis.

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FRANCK; FRANÇOIS-MARIE-LOUIS-ALEXANDRE GOBINET DE VILLECHOLLES (1816–1906)

French photographer and professor

French photographer, his studio was at 15, Place de la Bourse from 1859 to 1862, and 18, rue Vivienne from 1861 to 1880 in Paris. He was a Professor of photography at the Ecole Centrale in 1862, and was also a teacher at the Ecole Impériale centrale des arts et manufactures in 1863.

He was a member of the Societé française de photographie, becoming a member of the board of directors of the society from 1882 to 1900, a member of the Committee of organization of the international congress of Photography in 1888, and a member emeritus of the SFP in 1900. He was also a member of the jury of the Exposition Universellle of 1878. Additionally he was a Knight of the Royal Orders of Wasa (Sweden) and of the Crown of Italy.

Franck was born 21 December 1816 at the Château de Voyennes in the Somme department in France. He first embraced a literary career and he became interested in photography in 1845 with daguerreotype. From 1849 to 1857, he left the French republic and took refuge in Barcelona. From this period date photographs of Spain and Germany on salt paper and stereoscopy, and an album in four volumes untitled *Topographie d'Espagne.* From 1859 to 1880, Franck set up as photographer in Paris. He offered official and artistic portraits, artistic reproductions, industrials, views, monuments and later lessons in photography and illustrations for books. In 1862, he was professor at the Ecole Centrale of Paris and began his "Galerie universitaire contemporaine." Next year, he became the photographer of the high schools Polytechnic, Normale, Mines, Saint-Cyr and published group portraits until 1975. In 1864, Franck, apparently close to the power, photographed the Bishopric and the Legislative Corps. In 1865, he reproduced famous art collections displayed at the exhibition of the Central Union of Fine Art applied to Industry at the Industry

Palace in Paris, containing decorative art, ceramics, weapons, goldsmith's, tapestry and, among others, the Nieuwerkerke's collection. He gathered a hundred views in an album untitled *L'Art ancien.* In spite of his interest for art, Franck was above all a witness to the men and the changes of his time. In 1866, he published an *Album contemporain contenant les biographies de 300 personnages de notre époque* containing conventional portraits. After the Paris Commune in 1871–1872, he photographed the ruins of Paris and its surroundings.

In 1880, he sold his establishment at Chalot and devoted himself to the manufacture of opaline plates for slides. Ten years after, he retired in Asnières, 7, rue Saint-Denis. He died 16 January 1906 at Asnières.

LAURE BOYER

Publications

L'album contemporain contenant les biographies de 300 des personnages de notre époque, with Justin Callier, Paris, 1866.

L'Art ancien, Photographies des collections célèbres par Franck. 1ere partie: Exposition de l'Union Centrale des Beaux-Arts appliqués à l'industrie, Musée rétrospectif, Paris, 1865.

FRAUDS AND FAKES

The initial celebration, by William Henry Fox Talbot and others, of the superior "truth and fidelity" of photography gave way in the second half of the nineteenth century to an increasing awareness of the potential duplicity of photographic images and of photographic operators. Starting in the 1860s, questions of fraud and fakery emerged in relation to controversies and legal cases involving spirit photography, and in response to darkroom printing tricks that allowed photographers to alter a figure's setting or identity. Concerns about photographic deception followed advancements in techniques such as double exposure, combination printing, and the like. By the 1890s the notion that photographs cannot lie was routinely dismissed in print. In 1889, one critic went so far as to argue that, "in every case a photograph is but a deceptive representation of the object photographed" (Woodbury, 1898, 283). Similarly, in the context of aesthetic debates about photographic manipulations by the Pictorialists, Eduard Steichen wrote in 1903 that, indeed, "every photograph is a fake from start to finish" (Steichen, 1903,107).

In fact, the camera's special ability to deceive had been discussed as far back as Giambattista della Porta's sixteenth-century treatise on natural magic, in which he recommended using a walk-in camera obscura (literally: dark chamber) for presenting fantastic scenes for the astonishment of viewers, who "cannot tell whether they be true of delusions" (Porta, 1957, 364–365). Reframing the issue of natural magic in the nineteenth century, Scottish physicist Sir David Brewster amplified upon della Porta's observation that the optical image was in itself neither true nor false, but because it seemed true offered an especially potent agent of deception; only knowledge of the laws of Nature could enable one to test and verify potentially misleading sense impressions.

Talbot's 1844 *The Pencil of Nature* celebrated photography for its special grasp of "truth and reality," thus obscuring the ability of photographs to create false impressions. But, as inadvertently demonstrated by the example of Talbot's own *Scene in a Library* (actually shot out of doors in full sunlight), the circumstances under which a given photograph was made might not be immediately apparent in the image itself or in the statements made about the image (Charlesworth, 1995, 214–215). From studio portraits with false tree swings to Alexander Gardner's notorious civil war images of the "Rebel Sharpshooter" whose corpse has been rearranged by the photographer, nineteenth-century photographers frequently contrived aspects of the reality that they pictured. A famous 1883 portrait of Walt Whitman showing the poet with a butterfly perched on his finger, subsequently used as the frontispiece for *Leaves of Grass*, prompted skepticism during Whitman's own lifetime; it would seem that a cardboard butterfly had been rigged up for the occasion (Mitchell, 1992, 196).

Two of the most widely publicized cases of outright photographic fraud involved spirit photographers, the American William H. Mumler and Frenchman Édouard Isidore Buguet, who purported to be able to capture faint images of spirits along with living sitters on their photographic plates. Mumler was arrested in New York for fraud and larceny in 1869, but after a lengthy preliminary hearing, the case was dismissed, owing to the fact that neither the truth nor the fraudulence of his images could be proved beyond a doubt. But the widely reported hearing, including a deposition by the celebrated showman P.T. Barnum, raised public awareness of the many techniques for manufacturing fake photographs. The idea that photographs might provide questionable or false evidence and so needed to be viewed with skepticism thereby gained new currency (Leja, 2004, 57–58). In France, Buguet admitted to trickery and was convicted of fraud in 1875, serving jail time based on his discredited spirit photographs.

The technique for creating a ghostly apparition through double exposure ("for the purpose of amusement") had been laid out in Brewster's 1856 treatise on the *Stereoscope*, prior to the first publicized spirit photographs. In 1860, Oscar G. Rejlander used a double exposure to create a ghostly visage in his *Hard Times*, and, more important, had ambitiously elaborated on the possibilities of combination printing in *Two Ways of Life* of 1857. His *OGR the Artist Introduces OGR the*

Mumler, William H.. Untitled Portrait. Unidentified woman seated with arms of a "spirit" over her head.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

Volunteer, c. 1871, appears to show Rejlander twice in the same scene at the same moment—a trick that would come into a certain international vogue in the 1890s, notably in an image of Henri de Toulouse-Lautrec posing as both artist and model.

In the political realm, photomontage techniques were used in the 1860s in Italy to show the exiled Queen of Naples in compromising positions with contemporary religious leaders, and to place the head of Abraham Lincoln onto a variety of figures in various settings (Mitchell, 1992, 204–209). Along with the increasingly sophisticated use of such techniques there developed growing suspicion about photographic evidence.

Thomas Hardy 1885 novel, *A Laodicean*, featured a plot device whereby a photographic portrait of the story's hero was libelously manipulated in order to show him in a state of intoxication (Henisch and Henisch, 1984, 313). In 1894, British jurist Ernest Arthur Jelf used a constructed photograph in which former Prime Minister William Gladstone appeared to stand at the door of a London Pub to illustrate the "worthlessness" of photographic evidence (Tucker, 1987, 378–9). Similarly, the theme of entertaining but potentially misleading "Photographic Lies" was amply illustrated in an 1898 London magazine article with several "faked photographs," including one entitled, "Showing how a man can be in two places at once" ("Photographic Lies," 1898, 262).

At the same time, accusations of fakery were being leveled at photographers who manipulated their prints for purely artistic effect, prompting Eduard Steichen's sarcastic response in the first number of *Camera Work*. Addressing himself to "Ye Fakers," Steichen dismissed criticism that artistically manipulated prints were "faked" and argued that "faking" was present "in the very beginning" of the photographic process, the exposure itself. If all photographs were "fake from start to finish," then what mattered to Steichen was achieving authentic expression, not preserving the inherent truthfulness of the unmanipulated photograph, which for him, as for others of his day, was but a myth.

STEPHEN PETERSEN

See also: Brewster, Sir David; Photomontage and Collage; Pictorialism; Spirit, Ghost, and Psychic Photography; and Talbot, William Henry Fox.

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FRÉCHON, EMILE (1848–1921)

Emile Fréchon is considered an orientalist photographer. Fréchon moved to Algeria with the rapid development of tourism in search for exotism. Born in Normandy, in 1848, he worked as a journalist until Jules Gervais-Courtellemont asked him—in 1887—to come to Algeria to manage his photographic company.

Fréchon photographed the desert and was one of the first to do so. In the beginning of the 1890s Fréchon photographed the oasis of Biskra that he later published in *L'Algérie pittoresque et artistique* which was released by Gervais-Courtellemont in 1892. In 1895, he finally established his own studio and sold his images to European tourists. In addition to maintaining his own studio, he continued to trade with another studio in Etaples, located in the North of France and spent his time between both countries.

The Photo-Club de Paris, which displayed pictorial work in France, received his work and exhibited it in 1894 and 1895 in their Salon and published his photographs in their Bulletin. Fréchon developed a style close to that of the drawings typical France's naturalistic paintings. Critics called him the "photographic Millet." Indeed, he prefered landscapes to the urban aesthetic and liked to play with the oriental light to obtain backlighting. He died in 1921.

Marion Perceval

FREDERICKS, CHARLES DEFOREST (1823–1894)

According to Frank Leslie's *Illustrated Newspaper,* 11 September 1858, "Frederick's Photographic Gallery, 585 and 587 Broadway, was brilliantly illuminated with colored lanterns. The words 'Photographic Temple of Art' were formed by hundreds of lamps, covering a semi-circular arch of sixty feet in curve. The windows and balconies of these magnificent Daguerrian rooms were crowded during the day with spectators, almost to the interruption of business. There is no more popular photographic gallery in New York than this, and nowhere are portraits obtained with greater fidelity."

Having learned the daguerreotype process from Jeremiah Gurney—from whom he bought his first camera—Fredericks travelled and photographed throughout South America for nine years before briefly operating a studio in Paris in 1853.

His first New York studio opened in 1854, and for a short period 1855–56 he and Jeremiah Gurney were in partnership.

One of the first to introduce the carte-de-visite into America, Fredericks, for a time, also held the US Patent rights for the family album with its familiar slots. His studio had a prodigious output of both carte and cabinet format images, and continued in business until c. 1890.

Woodblocks based on his portraits of eminent figures—such as Samuel Walker, President of Nicaragua, and Commissioner Simeon Draper of the New York Police—regularly appeared in Leslie's *Illustrated Newspaper.*

John Hannavy

FREEMAN, ORRIN ERASTUS (1830–1866)

American photographer

Born in Boston, Massachusetts, Freeman was listed in the 1857 City Directory as a saloon keeper. His great grandfather had been a colonial governor and local lawyer, his grandfather a surgeon and his father was a house builder. Encouraged by stories of his younger brother Albert's financial success as a merchant in Shanghai, Orrin accompanied his mother and other brother, Melvin, on a four-month journey to China, arriving in March, 1859. He arrived in Shanghai with ambrotype equipment, determined upon starting a career in China as a photographer. Oddly, he chose the inland city of Soochow (present-day Suzhou), rather than Shanghai, to open his first studio. That seems to have been unsuccessful and he then advertised his studio's re-location to Shanghai in July 1859. Although moderately successful, he decided to move to Japan. By early 1860 he was operating Yokohama's first commercial studio and also trading in photographic equipment and other goods. Within a year of establishment, he was approached by Ukai Gyokusen, a wealthy merchant, who made Freeman a substantial offer for his ambrotype camera, equipment and lessons. Ukai would become the first professional Japanese photographer and Freeman, no longer connected with photography, would go on to amass a fortune as a Yokohama merchant. He died suddenly of paralysis in 1866 and is buried in the Yokohama Foreigners' Cemetery. [One of his ambrotypes is held by the *Numazu City Archives of Meiji History*, Japan.]

Terry Bennett

FRÉNET, JEAN-BAPTISTE (1814–1889)

French painter, photographer

As a young man he entered the Academy of Fine Arts in Lyon; in 1834 he went to Paris where he attended

the Academy of Fine Arts and trained in the atelier of Ingres. When Ingres took up his post at the French Academy in Rome, Frénet followed. After his return to France in 1837 he worked for some time in Paris; then settled outside of Lyon where he undertook regional commissions. Frénet, a committed Republican, became politically active after the revolution of 1848. He was the mayor of his small community and ran afoul of the authorities for falsifying election returns in the plebiscite of 1851. This effectively ended any hope for official painting commissions. He appears to have taken up photography in the early 1850s, perhaps as a response to the limitations to his career as a painter. Working with the paper negative, salted paper print process, Frénet made domestic portraits and intimate studies of informally posed family groups, as well as a small number of landscapes. Examples of his photographic production date to the 1850s and are limited to the paper process.

KATHLEEN HOWE

FRESNEL, AUGUSTIN JEAN (1788–1827)

French scientist and inventor

Fresnel was born on 10 May 1788 in Broglie, France. His father, Jacques Fresnel, was an architect who went on to work on harbour construction at Cherbourg. In 1794 the political situation in France led to work on the harbour being halted so the Fresnel family went to Mathieu, a village north of Caen, where young Augustin Fresnel spent the rest of his childhood. His parents were Jansenists, and Augustin was brought up with strict values in a stern atmosphere which would strongly influence him throughout his life.

After elementary education by his parents, and secondary education in Caen he entered the École Polytechnique in Paris in 1804 with a career in engineering in mind. Two years later he progressed to the École des Ponts et Chaussées, qualifying as a civil engineer. He was employed first in the Vendée and then on the building of a major road through France connecting Spain with northern Italy. However, he had a hobby: he was fascinated by light and undertook experiments in 1814. In 1815, when Napoleon landed at Cannes with some of his guards, Fresnel was so upset that he left his engineering job and offered to fight for the King against Napoleon. By 20 March Napoleon had reached Paris putting Fresnel in a difficult position. As a consequence he lost his engineering post and was put under police surveillance. He had few options left but to return to his home in Mathieu. In fact circumstances had conspired to give Fresnel the free time he needed to concentrate on his experiments with light. His work on optics soon convinced him of the validity of the wave theory of light which was, at that time, totally disregarded in favour of the corpuscular theory. After Napoleon was defeated at Waterloo, Fresnel was reinstated into his old engineering appointment. He was then only able to undertake research on light in his vacations. He was transferred to an engineering post in Rennes but continually requested leave so that he could go to Paris to continue his scientific investigations.

By applying mathematical analysis to his work Fresnel removed many of the objections to the wave theory of light. He knew little about the contributions by other scientists. He experimented with diffraction, making a breakthrough when he attached a piece of black paper to one edge of a diffracter and observed that then the bright bands within the shadow vanished. From this he correctly deduced that these bright bands were produced by light coming from both edges of the diffracter but since bright bands outside the shadow remained he deduced that they must result from light reflected from only one edge of the diffracter. He published his first paper in October 1815 on his wave theory of light, making a first attempt to explain the phenomenon of diffraction. He then applied the same mathematics which worked for his diffraction experiments to give theoretical results on interference patterns obtained by reflecting a light source with two mirrors. He verified the theoretical results by experiment. Much of this early work was already essentially known, but Fresnel next developed a new theory, publishing tentative results in July 1816. After working for a while on polarisation of light during 1817, he returned to his theories of diffraction when the Académie des Sciences announced that the Grand Prix for 1819 would be awarded for work on that topic. He was confident of his theory since his mathematical deductions from the one simple hypothesis led to results which he had verified experimentally. In his submission he calculated the intensity of light at every point behind the diffracter using what were later called Fresnel's integrals.

In 1819 the committee to judge the Grand Prix met consider Fresnel's submission but most members including the chairman Arago and Poisson believed in the corpuscular model. However Poisson was fascinated by Fresnel's mathematics and discovered further consequences beyond those which Fresnel had deduced. Poisson showed that a bright spot would be seen in the centre of the shadow. Arago asked that Poisson's remarkable predictions based on Fresnel's model be tested. Indeed the bright spot was seen exactly as Fresnel's theory predicted and the Grand Prix was awarded. Fresnel zone plates, used in photography, rely on this work. Despite this triumph for wave theory, polarisation of light produced by reflection still provided a strong argument in favour of the corpuscular theory. Fresnel and Arago, now very confident that they could explain this effect with Fresnel's theory, undertook further

work on polarisation. Fresnel discovered what was later called circularly polarised light. No hypothesis led to the experimental results obtained other than that light is a transverse wave and, in 1821, Fresnel published a paper in which he claimed with certainty that light is a transverse wave. This went too far for most, even Arago, but Fresnel stunned his critics when he next showed that double refraction could be deduced from the transverse wave hypothesis.

After 1824 he devoted less time to his researches on light. He was employed by the Lighthouse Commission and as part of his effort he invented so-called *Fresnel lenses* which were made by splitting a large lens into stepped concentric rings and mounting them in the same plane. These quickly replaced mirrors for lighthouses and lenses as large as 3 metres in diameter have been constructed using this method. This invention has found numerous other applications, including the lenses in theatre lights, collimators in overhead projectors and the lenses in the view-finders of SLR cameras.

Fresnel died of tuberculosis in on 14 July 1827 in Ville-d'Avray, France at the age of 39. He had struggled throughout his life against ill health but it is remarkable that he was able to undertake an exceptionally high workload despite suffering from severe fatigue. Perhaps it was the strict religious upbringing by his parents which gave him the strength to overcome his illness for so long.

The unit of optical frequency has been named after Fresnel. One *fresnel* is 1012 hertz (one *terahertz*).

JOHN O'CONNOR
EDMUND ROBERTSON

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FRESSON AND FAMILY, THÉODORE-HENRI (1865–1951)

French inventor of carbon paper Charbon-Satin

Agronomist by profession, Théodore-Henri Fresson also worked on electronics and with military technology. In 1899 he presented before the French Photographic Society "Photographic proofs printed on carbon paper that can be developed without transfere." His process came from Charbon-Velour (Victor Artigue. 1889) commercialised in 1893. The composition of the Charbon-Velour Paper was a secret and so was the formula for the Charbon-Satin (with the exception of the inventor family, the photographer José Ortiz Echague and the workshop Luis Nadeau in Canada).

By the 1900's and thanks to the efforts of Maria, the wife of Fresson, and their sons Pierre and Edmond, the Charbon-Satin was manufactured and sold. Fresson's product was more reliable than the Artigue process it was in competition with it.

Thereafter, the advent of small format negatives forced Pierre Fresson to adapt the procedure for enlargements. From 1947, the Fresson brothers, aided by their children (Micheline and Jacques for Edmond, Colette and Monique for Pierre) achieved prints production themselves in their workshop at Dreux. The sale of monochrome prepared papers progressively decreased around 1950. In response to this, Pierre Fresson, helped by his son Michel, adapted the process to quadrichromy (the first process for the production of permanent colour images). In the sixties, their main clients were advertising photographers. Since the seventies, the 'Atelier Fresson' has been prized by artists and photographers such as John Batho, Bernard Plossu and Bernard Faucon. In 1978, the son of Michel, Jean François Fresson, joined the team, continuing a one hundred year family tradition.

LUCE LEBART

FRESSON PROCESS

The genesis of this process takes us back to Alphonse Poitevin's carbon process of 1855, whose original patents (Fr. Pat. 24,592, Aug. 27; the Engl. Pat. 2,816 of Dec. 13, 1855 is not as complete) covered both carbon printing and collotype. The carbon process takes its name from the carbon black pigment that Poitevin used in his early experiments. Any permanent pigment mixed with potassium dichromate and a colloid such as albumen, gelatin or gum arabic, will result in an emulsion sensitive to light. Exposed under a negative, a dichromated pigment coating will become insoluble proportionally to the amount of light it receives. Parts of the image which are protected by the dense areas of the negative will remain water soluble and will reveal clear highlights after development has taken place in cold or hot water, as required by the nature of the colloid used. This process, which does not involve a transfer of the emulsion before development (unlike the carbon transfer process), is referred to as "direct carbon."

Few people used the original Poitevin direct carbon process as the resulting images produced a short scale with excessive contrast which most photographers considered inferior to the silver prints of those days. This technique remained largely dormant until it was revived, under the name of gum printing, ca. 1894, by Rouillé-Ladevèze in Paris. In the meantime direct carbon was used for the reproduction of tracings and architectural drawings and one particular variant, introduced by Frédéric Artigue, around 1878 was adapted by

his son, Victor, for the production of continuous tone photographs, in 1893.

To achieve this, the removal of the unhardened pigment emulsion had to be effected by the use of a solution of plain water and sawdust, the latter acting as an abrasive. The Artigue paper, marketed as Charbon-Velour, could provide beautiful prints with a matt surface but the process was far from perfect for commercial use.

Théodore-Henri Fresson (1865–1951) was an agronomist by profession and a man of many talents. Throughout his life he worked on agronomy, electronics, photography, military technology and other technologically advanced processes. Around 1893, he saw the carbon paper Artigue Charbon-Velour advertised in a photography store. That paper was the first commercial attempt at producing a carbon paper that did not require transfer prior to the development in order to maintain a perfect gradation of the image. The Charbon-Velour, however, was not entirely satisfactory. No two batches were alike, due mainly to the large number of uncontrollable factors in the manufacturing of the paper.

Fresson became interested in the problem and after several years of research began the manufacture and sale of his Charbon-Satin around 1899. The paper was available in 20 colors on various types of textured bases. Absolute secrecy was maintained as to the details of the process which was used strictly by members of the family from one generation to the next. Exceptions in recent years have been the late José Ortiz Echagüe and this writer. No patents were taken for further secrecy.

Fresson paper was imported and sold in America by Edward Alenius, between 1927 and 1939. After the War, the Fresson family concentrated its efforts on printing for other photographers, instead of selling the paper for outside use, although it has been made available from time to time.

The best known exponent of the Fresson process was the late José Ortiz Echagüe (b. 21 Aug. 1886–d. 7 Sept. 1980), whose fabulous work can be seen in the collections of major museums, including that of the Royal Photographic Society of Great Britain, now located at the National Museum of Photography, Film & Television, in Bradford and the Metropolitan Museum of Art in New York city. There are about 1,000 of his prints in North America, 3,000 world-wide. He is considered the most important Spanish photographer of the 20th century. After his death, his family donated his photographic negatives and prints to the University of Navarra in northern Spain.

Ortiz Echagüe bought the Fresson formulas and equipment necessary to manufacture the paper from a relative of the Fresson family, in 1966.

The transaction was carried out secretly to avoid the wrath of the rest of the family. After lengthy and tumultuous negotiations, Luis Nadeau in Canada acquired the process through him in 1979, shortly before his death.

C. Puyo and Robert Demachy, in France, and Léonard Misonne, in Belgium, were some of the early pictorialists who used the Fresson process. More recently, Frank Horvat, Bernard Plossu, Lucien Clergue, Sheila Metzner, Sarah Moon and Tourdjman, have had some of their work printed by the Fresson family. Most modern work is printed by the four-color version (quadrichromie-Fresson), introduced by Pierre Fresson in 1951. The color variant of this process has never been used outside France.

The highly coveted Fresson process has attracted considerable attention, as it can provide beautiful and light-fast prints, and is the last, early proprietary photographic process of importance still jealously guarded by a handful of people, namely the descendants of the inventor, in France, and this author, in Canada. It is currently the only true photographic process commercially available that can produce a permanent color print without a photomechanical screen.

LUIS NADEAU

See also: Carbon Print, Collotype, Demachy, (Léon) Robert, Fresson and family, Théodore-Henri, Gum Print, Misonne, Leonard, Poitevin, Alphonse Louis, Pouncy, John; and Swan, Sir Joseph Wilson.

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FRIESE-GREENE, WILLIAM (1855–1921)

English photographer

Born William Edward Green, 7 September 1855 in Bristol, England. Father James Green, metal craftsman.

Became William Friese-Greene after marriage to Victoria Mariana Helena Friese in 1874. Apprenticed to photographer Maurice Guttenberg of Bristol. Became owner of portrait studios in Bath, Bristol, Plymouth, London and Brighton. In partnership in the 1880s with Esmé Collings. Inspired by J.A.R. Rudge's glass-plate moving images, Friese-Greene patented two sequence cameras for flexible materials: one (1889) with engineer Mortimer Evans, another (stereoscopic, 1893) from a design by Frederick Varley. Paper (and later, celluloid) 'films' taken with his cameras, including a view of Kings Road, Chelsea, were at a slow rate, and projection was unsuccessful. Helena died 1895. He devised, with John Alfred Prestwich, a flickerless projector (1896). Married Edith Harrison in 1897. Patented a color motion picture process (1905). Other patents through 1921—some practical, others unworkable—included electrical devices, X-Rays, inkless printing, and color photography. Poor financial control led to two bankruptcies. He died 5 May 1921, London. Claimed to be, and posthumously championed as 'The Inventor of Kinematography,' he was subject of an unreliable biography, *Friese-Greene: Close-up of an Inventor* (Ray Alister, London: Marsland 1948), and a romantic biopic *The Magic Box* (1951).

STEPHEN HERBERT

FRANCIS FRITH & CO.

In 1884 the British photographer Francis Frith wrote his memoirs of the first sixty-two years of his life, the first words of which were as follows: "I am what circumstances over which I have had little or no control from my very birth have made me." Such modest words open the autobiography of a man who had amassed a fortune in the grocery business by the time he was thirty-four and then went on to become one of the pre-eminent travel photographers of his day and founded F. Frith & Co., a photographic printing firm and archive in England that was the largest of its kind in the 19th century.

While not the only photographer of his era to publish scenic views of exotic places and monuments commercially, Frith was arguably the most prolific, and an integral figure in the popularization of the travel photograph specifically, and commercial photography generally. His reputation as a photographer was established largely on his photographic work from his three expeditions to the Near East between 1856 and 1860. Indeed, the critical and commercial success of these photographs allowed Frith to start Frith & Co., whose vast photographic archive would survive well into the 20th century and become Frith's greatest legacy.

Francis Frith Jr. was born on October 7, 1822 in Chesterfield, Derbyshire to Francis and Alice Frith. The second of three children and the only son to a prosperous wine merchant, Francis Frith Jr. grew up in a liberal yet devout Quaker household. He spent the first decade of his life in Chesterfield, spending much of his youth exploring the bucolic hills and woods surrounding his home. At the age of ten Frith was sent off to a Quaker boarding school where he remained until the age of sixteen. In 1838, upon the completion of his studies and at the insistence of his father, Frith began a five-year apprenticeship in a Sheffield cutlery firm.

Frith never completed his apprenticeship, however, as he had what can best be described as a nervous breakdown around 1843 and returned home for an extended convalescence. After regaining his health Frith traveled the towns and countryside of Scotland and Wales for the better part of two years. At trip's end Frith reentered the world of business, this time in the thriving, industrial seaport of Liverpool, where sometime around 1845 he and a partner started a wholesale grocery business provisioning transatlantic vessels. The company flourished, and Frith eventually sold the business and used the proceeds to finance a small printing company around 1850, which also proved successful. By 1856 Frith sold his printing firm as well and, having amassed a small fortune from his two business ventures, retired a wealthy man at the age of thirty-four.

It was apparently during his time in Liverpool that Frith first took an interest in photography, so much so that in 1853 he became one of the founding members of the Liverpool Photographic Society. When Frith finally left Liverpool after the sale of his printing firm and moved to Reigate, a town south of London, he continued his photographic activities and even exhibited a number of his photographic portraits and landscapes at the Photographic Society of London in January 1856.

Soon after relocating to Reigate, however, Frith decided to travel, and in September of 1856 he set sail for Alexandria, Egypt on the first of three life-changing photographic expeditions to the region. His itinerary combined his enthusiasm for photography and travel with an astute entrepreneurial awareness of the eager market in Victorian Britain for photographs of the Near East, at that time a region known mostly through written accounts and the drawings and lithographs of the Scottish artist David Roberts. Accompanying Frith on his expedition to the Near East was Francis Herbert Wenham, a friend and engineer who advised Frith on the mechanical and optical aspects of photography.

Frith and Wenham traveled to archeological sites across Egypt with an entourage of assistants and staff and a small convoy of wagons needed to transport the sizable photographic outfit required by Frederick Scott Archer's recently introduced wet-plate collodion process and Frith's three different cameras: a standard full-plate (200 × 250mm), a mammoth (400 × 500mm) and a small stereoscopic camera. Frith preferred the clarity provided by the wet-plate system's glass negatives and

its capacity to produce multiple high-quality prints, despite the logistical problems posed by the elaborate equipment and the collodion process's demanding system of on-site preparation and development of the photographic plates—a complex procedure made all the more difficult by the Near East's difficult terrain and often inhospitable climate.

Despite these and other hardships endured along the way, Frith managed to photograph scores of ancient archeological sites, monuments and topographic views throughout Egypt, especially in the area around Thebes. Using his three cameras, he often shot the same subject in multiple formats and from several perspectives to enhance their future commercial possibilities. Among Frith's finest photographs from this expedition are those of the Sphinx and Great Pyramid of Giza, the pyramids of Dashoor and of the colossal sculpture at Abu Simbel.

Frith returned to England in the summer of 1857, where his photographs appeared in an album published by James S. Virtue of London. The London-based firm of Negretti and Zambra also distributed a well-received series of his stereo views. Frith's cache of remarkable topographical views proved quite popular, as their fine detail and uniqueness perfectly suited the burgeoning Victorian fascination with exotic places.

In light of this success, Frith quickly set off once more for the Near East in November 1857, persuaded by Negretti and Zambra to produce a new set of photographs concentrating on the biblical and historical sites of Palestine and Syria. On this second expedition Frith photographed the mosques, tombs and streets of Cairo, the important archeological sites of Jerusalem, Bethlehem, Damascus and Hebron, and the Roman ruins at Baalbek.

He returned to England in May 1858 with a second trove of photographs from the region. Once home Frith gave lectures on his travels while exhibitions of his photographic prints were held and projections of his transparency views drew large audiences. His photographs once again received wide circulation throughout England as stereo views, and were also combined with those from his first trip into a book titled *Egypt and Palestine Photographed and Described by Francis Frith.* This two-volume album, printed in an edition of 2,000 in 1858 and 1859 and distributed by subscription, proved immensely popular, its combination of remarkable photographic views with Frith's first-hand written account providing a surrogate tour of the Near East for Victorian tourists and would-be tourists alike.

Encouraged by the wide appeal and commercial success of his photographs from Egypt and Palestine, Frith embarked on a third and final trip to the Near East in 1859. On this last photographic expedition he re-photographed Cairo, the pyramids and monuments of Giza and Abu Simbel, and the Hall of Columns at Karnac. His team also traveled by camel up the Nile River, pressing on to a remote point almost 1000 miles south of the Nile Delta where only a handful of Europeans and no other photographer had ever ventured before. There, in the region of southern Egypt and northern Sudan then referred to as Nubia, Frith photographed the temple of Amenhotep III at Soleb.

Upon his return to England in 1859 Frith married Mary Anne Rosling—with whom he would go on to have eight children—and set about establishing his own photography printing and publishing firm in Reigate. The firm, F. Frith & Co., was largely devoted to the publication and dissemination of travel photography in a variety of formats. Frith continued to have books of his photographs from his three expeditions published, among them a series published in 1860–1861 concentrating on his final expedition titled *Cairo, Sinai, Jerusalem, and the Pyramids of Egypt, and Egypt, Nubia and Ethiopia (1862), a volume devoted to one hundred of Frith's stereographs to be experienced with a small viewer provided with each copy. Additionally, some fifty-six of Frith's views of the Holy Lands adorned a* two-volume edition of the *Queen's Bible* published in 1862–1863.

Soon after the founding of his company, Frith turned his attention to photographing and publishing views of the towns and countryside of Britain and Continental Europe, driven in part by his ambition to photograph every city, village, ruin and site of topographical interest in Britain. From his rapidly-expanding photographic archive Frith sold individual prints of his scenic views and later souvenir picture postcards, both of which proved popular among the growing throngs of Victorian tourists traveling across the British countryside by rail. As the demand for such souvenir views grew over the years the production of photographic cards became a large part of the Frith & Co. printing and publishing business.

In order to keep pace with this demand for photographic keepsakes and to expand his inventory of views, Frith employed a team of photographers. He and his photographers scoured Britain for worthy views and embarked on photographic tours of Italy, Switzerland, Scandinavia, and the Rhine valley in Germany. Frith also bought the rights to suitable photographs from other photographers and published them under his studio's name. Among the photographers who contributed to Frith & Co.'s image archive were such notables as Francis Bedford, Frank Mason Good, William Bell and Roger Fenton, whose collection of negatives Frith had bought in 1862. Thus, while Frith's earliest photographic prints often bore his own signature and date scratched onto the negative, as Frith & Co. grew most of the firm's images remained unsigned, often bearing

only an identifying imprint of the firm itself, typically "Frith & Co" or "F F & Co."

Before long Frith had amassed the largest archive of its kind, including images from all across Britain and beyond, and he continued to publish in a variety of formats. Indeed, twenty-four of Frith's views of the Rhine and Switzerland illustrated an 1865 edition of Henry Wadsworth Longfellow's *Hyperion.* He also supplied the text and images for both *The Gossiping Photographer at Hastings* and *The Gossiping Photographer on the Rhine*—two curious books published at his Reigate facilities in 1864, which he published in addition to such straightforward regional studies as his 1867 Book of the Thames. Above all, however, Frith increasingly sold his images as individual prints and as picture postcards through a network of more than two thousand shops and newsagents in cities and towns across Britain. By 1876 the firm's nearly 700-page catalogue listed over 4000 images including many from Asia, Canada and the United States, and by the 1890s the firm had tens of thousands of subjects on file relating to Britain alone. Indeed, in its production, commercial distribution and sheer variety and quantity of photographic images Frith & Co. was in Frith's lifetime without peer.

By the 1880s Frith, with his health deteriorating, had effectively handed over control of Frith & Co. to two of his sons, Eustace and Cyril. The elder Frith went on to write several books about his Quaker faith, take up oil painting, and penned his autobiography. He died at his winter residence in Cannes, France on January 25 1898 at the age of seventy-six. Frith & Co. continued on under Eustace and Cyril, who for a time sustained the firm's position as a leader in the postcard business around the turn of the century, when the Post Office's acceptance of a standardized format accounted for a new explosion in the postcard's popularity. Eventually, however, the company's prominence waned, and by World War I the family sold the business.

The company's image archive did continue to grow after Frith's death, as successive teams of photographers that met the strict standards and requirements of Frith & Co. continued to photograph for the collection. Indeed, by 1914 the company archives contained some 50,000 photographs, which increased to over 70,000 by 1939. And while the company managed to survive under new management well into the 20th century, the Reigate facility was soon sold and much of the original photographic archive languished as increased competition and rapid topographical change in urban and rural areas relegated Frith & Co. to the margins of the postcard business, their outmoded views of towns and countryside from bygone eras of little interest. By the time the company finally closed in 1971 the archive, which contained over 250,000 prints and 60,000 original glass plates, including views of 7,000 cities and towns from around the world, was in poor condition from years of neglect. Now restored and preserved as an important photographic record of the 19th century, a substantial collection of the company's glass negatives now resides in the Birmingham City Library.

MAXIM LEONID WEINTRAUB

See also: Wet Collodion Negative; Archer, Frederick Scott; Bell; William; and Fenton, Roger.

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FRITH, FRANCIS (1822–1898)

English photographer, publisher

Francis Frith dominated the photographic publication industry in England in the late nineteenth century. As a photographer, he is known for the hundreds of photographs he made in the Near East during the course of three separate journeys (1856/57, 1857/58, 1859/60) through Egypt, Syria, and Palestine. In execution and in published presentation, his photographs, accomplished on wet collodion glass plate negatives and printed in albumen, set the standard for the burgeoning market for travel photography.

Frith was born to a Quaker mercantile family in Derbyshire. Apprenticed in the cutlery trade, he ultimately settled in business as a wholesale grocer provisioning ships out of Liverpool. His business did well and he sold up and retired at age thirty-four to devote himself to personal interests which included photography. He appears to have learned photography in the early 1850s and in 1853 was one of the founding members of the Liverpool Photographic Society. In 1856, accompanied by a friend, Frances Wenham, Frith set out on a meticulously planned expedition to photograph Egypt. He had shown photographs prior to this; in January 1856 he exhibited at the Photographic Society of London. And he established a connection with the London firm Negretti and Zambra, which listed for sale stereo views of Wales by Frith. When he set out for Egypt in the fall of 1856 he had with him cameras in three formats—standard,

Frith, Francis. The Ramesseum of El-Kurneh, Thebes-First View. *The Metropolitan Museum of Art, Gilman Collection, Purchase, Anonymous Gift, by exchange, 2005 (2005.100.633) Image © The Metropolitan Museum of Art.*

mammoth plate, and stereo. Frith's correspondence, as well as journal entries and reports by Wenham published later, provide detailed information on the logistics of travel photography.

Frith returned from this first trip in July 1857 and departed again that fall for Egypt with the intention of extending his photographic coverage into the Holy Land. While Frith was on this second tour, the publisher James Virtue announced *Egypt and Palestine Photographed and Described by Frances Frith* (1858-1860), available by subscription. The first numbers were released prior to Frith's return and received great acclaim. This was not the first publication of his photographs of Egypt. Negretti and Zambra had released an extensive set of stereo images, *Egypt and Nubia: Descriptive Catalogue of One Hundred Stereoscopic Views of the Pyramids, the Nile, Karnak, Thebes, Aboo-Simbel, and All the Most Interesting Objects of Egypt and Nubia* (1857) which met with wide success. Upon his return he exhibited photographs from the second journey, including an impressively large (8½ feet in length) panorama of Cairo. Inspired by the commercial success of stereo views and the subscription *Egypt and Palestine*, and perhaps to insure the quality of photographic printing, Frith formed a photographic printing firm, Frith and Hayward, with a London printerseller. He returned to Egypt and the Holy Lands for a third and final time in 1859, at which time he rephotographed Jerusalem and other biblical sites, and retraced and photographed the putative path of Moses and the Israelites across the Sinai Peninsula.

Frith's career as a publisher of photographic images began in earnest in 1860. Frith and Hayward's printing operation expanded and moved to Reigate. In 1862 Frith acquired sole ownership and continued printing as F. Frith and Company. Nickel estimates that to meet the demand for Frith's Near Eastern views, the Reigate operation printed more than 152,000 plates from Frith's negatives (Nickel 2004, 78). A second publication with Virtue followed; *Cairo, Sinai, Jerusalem, and the Pyramids of Egypt* (1860–1861), also offered by subscription, and based on photographs from Frith's third expedition. At the same time, twenty mammoth plate photographs were offered in a folio edition by Wm. Mackenzie, *Egypt, Sinai, and Jerusalem* (1860). In 1862 he brought out two editions of a photographically illustrated Bible—a version with twenty standard format photographs, and a lavish version with mammoth plates, dedicated to Victoria and titled *The Queen's Bible*. The definitive publication of photographs from all three expeditions, *Egypt, Palestine, and Nubia* (1862) was released in four volumes organized by region. Frith offered his Near Eastern views in a variety of formats for distinct audiences—stereo views and lantern slide programs appealed to both the popular taste for spectacle and the Victorian interest in self-improvement. Lavishly produced volumes of image and text, offered by subscription, were intended for a cultured, well-educated audience. "In both stereo and projected forms, Frith's imagery was, at the outset, directed at a mass market…it was conceived and offered as spectacle…" (Nickel 2004, 71).

Frith's next project offered photographs from less exotic locations: *The Gossiping Photographer at Hastings* (1864) and *The Gossiping Photographer on the Rhine* (1864). *The Gossiping Photographer* books coincided with the change in travel patterns of the middle class.

When Frith had left for Egypt in 1856, he was making a journey that few of the viewers of his photographs would ever physically make. The multiple publications from his three journeys provided a photographic simulacrum of travel, as well as offered instruction in the lands of the Bible and North Africa. By 1864, travel around England and the continent for pleasure was not unusual. Thomas Cooke was well established offering package tours to regions of England, France, and Germany. (Package tours of Egypt were not introduced until late 1869.) The photographs in *The Gossiping Photographer at Hastings* show the recently built seaside hotels and growing crowds of holiday visitors. Frith's photographs and his breezy text describe places and experiences which his audience expected to share. Frith had relinquished the role of educator to become the "gossiping" photographer one might meet along the way, sharing his views of the places his readers expected to experience.

Frith's photographic printing enterprise is a milestone in the industrialization of photographic printing and publishing in Great Britain. Newly married and after sustaining financial losses, Frith needed income and recognized the burgeoning commercial possibilities in photographic printing. Beginning with the short partnership with Hayward, quickly followed by F. Frith and Co. at Reigate, he initiated the rapid, centralized, factory-scale printing of glass plate negatives. Frith and Co. soon became the largest photographic printing firm in the United Kingdom with a particular specialization in travel photography. Frith acquired negatives from other photographers and commissioned operators to expand the catalogue. In 1876, the catalogue listed over 4000 images. Frith and Co. published a variety of materials—photographic instruction books, illustrated books, and sets of stereo cards. He provided and printed photographs for illustrated novels and travelogues, such as Longfellow's *Hyperion: A Romance* (1865), which was illustrated with photographs he made on his Rhine trip. After 1870, Frith devoted less time to the firm. Always a deeply religious man, he took up service as a Quaker Minister. In the 1880s, he turned control of Frith and Co. to his sons. He died in 1898 in Cannes, France.

KATHLEEN STEWART HOWE

See also: Negretti and Zambra; and Frith & Co.

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FRIZSHE, JULIUS FEDOROVICH (Carl Julius) (1802–1871)

Chemist and biologist

Julius Frizshe was born in 1802 in Neustadt, Germany. He graduated from the Berlin University in 1833 and settled in Russia in 1834. Since 1838 he was an adjunct professor in the St. Petersburg Academy of Science and in 1844 was elected an academician.

The newly invented photographic process aroused great interest amongst the Academy's members and they sent their corresponding member Josef Hamel (1788–1862) to acquaint himself with it. Hamel first visited Henry Fox Talbot in London, and later sent a description of the process in May of 1839 to St. Petersburg along with several prints. The Academy Assembly instructed Frizshe to survey Talbot's method. The academician informed them of the results of his research on the 23rd of May of 1839 and demonstrated how he made two pictures of foliage through the use of photogenic drawing, which he improved in the course of his work. Frizshe found Talbot's method capable only of creating images of flat objects, and from this point of view, the process greatly limited images capability and usability for scientific purposes. This report was the first scientific work on photography in Russia.

In 1843, Frizshe became a member of a commission which studied the Caucasus's mineral waters. He took a daguerreotype camera with him and under his supervision, S. L. Levitsky made daguerrotypes showing Caucasus's views, which were later sent to the French optician Chevalier in 1844.

ALEXEI LOGINOV

FROND, VICTOR (1821–1881)

Born in Montfaucon, France, on November 1, 1821, Jean-Victor Frond learned photography in Lisbon. He arrived in Brazil in 1852 after fleeing a penal colony in Algiers, where he had been a political prisoner of

Napoleon III. In 1858 he opened a photographic studio in Rio de Janeiro and embarked on an ambitious project with the support of Pedro II—producing a photo documentary on the emperor's vast realm with essays by French author Charles Ribeyrolles titled *Brésil Pittoresque* (Picturesque Brazil). Due to Ribeyrolles' sudden death in 1860, the project was limited to Rio de Janeiro, Minas Gerais and Bahia. The book contains engravings from Frond's photos, produced by Lemercier in 1859, including the first portrayals of plantation slaves at work and rural life in Brazil. Frond set the standard for landscape photography in Rio, and popularized subjects such as Sugarloaf Peak and Outeiro da Glória Church. He died in Varredes, France on January 16, 1881. Until six originals were found in 1994, the only known examples of his work were the prints illustrating *Brésil Pittoresque.* In 2004, researchers found 16 more original Frond photos of Swiss settlements in Espírito Santo province, commissioned by Pedro II in 1860 to lure more European immigrants there.

SABRINA GLEDHILL

FRY, PETER WICKENS (D. 1860)

English photographer

Peter Wickens Fry qualified as a solicitor and, towards the end of his life, represented the London wet plate portrait photographer James Henderson in the 1854 court case *Talbot v. Henderson* brought by Talbot for alleged infringement of his calotype patent. Judgement on the case was postponed as a result of the celebrated *Talbot v Laroche* case, and Fry eventually gained damages and costs for his client amounting to £330.

Fry developed an interest in photography in the 1840s, and was one of the founder members of the Photographic Club (often now referred to as the Calotype Club), an informal grouping of enthusiastic users of Talbot's process. He later became a founder member of the Photographic Society of London in 1853.

He first collaborated with Archer shortly after Archer published his account of the wet collodion process, and at the Great Exhibition of 1851, Archer and Fry contributed a single collodion positive (ambrotype) to the photographic equipment exhibit staged by London dealers Horne & Thornthwaite.

Fry counted many early photographers amongst his friends, including photographers John Dillwyn Llewellyn and fellow lawyer Roger Fenton, and was the study of a well known caricature by the artist George Cruikshank.

Obituaries to him were carried by both the *British Journal of Photography* (October 1st 1860) and *Photographic Notes* four days later.

JOHN HANNAVY

FRY, SAMUEL (active 1870s–1880s, d. 1980)

"When great difficulties were looked for none were found," declared Samuel Fry in 1879, on progressing from collodion to dry plates. Fry lived in Surbiton, Surrey, England, but practised professionally throughout the Thames Valley because it was the "favourite place of residence for city merchants." Fry travelled in a horse-drawn van, which carried sufficient equipment to undertake views, groups and outdoor portraits, but including "some small-sized plates of a more rapid description, in case groups, portraits, or animals have to be photographed."

Eschewing the "stern necessity of keeping still for portraits," Fry explored the boundaries of "instantaneous photography" and developed techniques to record "in the twinkling of an eye." By 1881, he had established a company for manufacturing his own brand of plates, the Kingston Special, which "preserve their qualities indefinitely in any climate." Advertisements in *The Photographic Journal* emphasised that tests involved portraits and landscapes before despatch.

Warning readers that "we must remember that photography is still very young," Fry published papers on positive printing, printing on ivory, printing transparencies, lunar photography, the moon in the stereoscope, photography and its students, instantaneous photography, defects, and remedies for paper prints, and often lectured to South London Society.

RON CALLENDER

FRY, WILLIAM ELLERTON (1846–1930)

The book *The Occupation of Mashonaland* by William Ellerton Fry, privately published in 1891 offers a unique visual record of the Pioneer Column expedition into the area of Africa which is present day Zimbabwe, and the establishment of Fort Salisbury.

William Ellerton Fry had arrived in South Africa in 1872 and worked briefly as a farmer and a merchant, before taking on the post of Secretary of the Royal Observatory at Cape Town, a post he held for almost twenty years, eventually attaining the position of Assistant Astronomer Royal. Then in 1890, enrolled as a lieutenant in the Pioneer Corps, he accepted the role of official photographer to the Mashonaland expedition.

The expedition, amounting to several hundred soldiers, policemen and native bearers, trekked into areas where a camera had never before been seen. Arriving at the ruins of the city of Zimbabwe, Fry's equipment caused consternation. In a memoir written later, Henry Hoste noted that "Fry, who was our official photographer, got his camera going, to the great alarm of the

natives, who watched him in fear and trembling, expecting an explosion every moment."

Fry's published visual account of the journey comprised 150 145mm × 195mm carbon prints on pages 465mm x 300mm, of the places and the peoples the Pioneer Corps encountered along their arduous journey.

He is believed to have left Africa after the expedition, and traveled to Australia and New Zealand.

JOHN HANNAVY

FULHAME, ELIZABETH (active 1780s–1790s)

English chemist

Mrs Elizabeth Fulhame's scant personal details are known almost without exception by her own few comments, published in the preface of her 1794 chemical treatise, An Essay on Combustion with a view to a new art of Dying and Painting wherein the phlogistic and antiphlogistic hypotheses are proved erroneous (London: J. Cooper). The book became rapidly known in chemical circles, having been donated to the Royal Society Library in 1795 by the author, and translated into German in 1798, by August Gottfried Ludwig Lentin (1760–1823) a tutor in Chemistry at the Georg Augustus University, Göttingen. The book was later reprinted in an American edition of 1810. It is the practical part of her treatise that concerns photographic chemistry, although it was her theory on combustion that earned her praise and election as an honorary member of the Philadelphia Chemical Society. Fulhame precipitated silver and gold salts not only to dye patterns on cloth, but also to paint rivers on maps. In making these experiments, Fulhame was an important part of the 18th century movement to use metal salts and chemical reactions to make patterns visible. Her demonstration of the reduction of silver proved influential to many later experiments in photochemistry, embodying the principle of 'hypo,' as invented by J.F.W. Herschel.

KELLEY WILDER

FYFFE, ANDREW (1792–1861)

Scottish photographer

Andrew Fyffe was a minor, but briefly influential, figure in early Scottish photography. He was the eldest son of Andrew Fyffe, dissector in anatomy at Edinburgh University. The younger Fyffe graduated in medicine in 1814 but earned his living primarily as a teacher of chemistry. He became Vice-President of the Society of Arts in Edinburgh in 1839, the same year as the announcements of the first practicable photographic processes. Fyffe began investigations into the chemistry of the early processes and embarked on a series of popular and well-attended lectures where he described Talbot's photogenic drawing along with his own improvements. He recommended paper sensitised by silver phosphate as an alternative to silver chloride, outlined a procedure for making direct positives, showed how photography could be applied to lithography, and suggested replacing the lens of a camera with a mirror. By January 1840, Fyffe was able to give perceptive comments on daguerreotype practice to an enthusiastic Scottish public. Although the Society of Arts for Scotland awarded Fyffe a silver medal for his photographic work, he soon returned to teaching. He died in Edinburgh in 1861. A lithograph derived from photographic images by Fyffe survives in St Andrews University Library.

JOHN WARD

G

GAENSLY, WILHELM (GUILHERME) (1843–1928)

Swiss-born Brazilian photographer

One of Brazil's most renowned 19th-century landscape photographers, Wilhelm Gaensly was born in Switzerland on September 1, 1843, in the evangelical community of Felben-Wellhausen. In 1848, his mother, Anna Barbara Kym Gaensly, took young Wilhelm and his two brothers to join their father, Jacob Heinrich Gaensly, in Salvador, Bahia, in the Brazilian Northeast. Like other Swiss immigrants, they attended the British Church, the first Protestant church in Bahia, which Gaensly later photographed, providing a precious record of that historic building, which was demolished in 1975. Known professionally as Guilherme Gaensly, he started his career as a teenager, working as Albert Henschel's assistant at "Photographia Alemã" (German Photography). In 1871, he formed a partnership with Waldemar Lange and Joseph Schleier (1827–1903), a German national with a Swiss Protestant wife. The firm was originally called "Maison Gaensly & Lange," and its staff included the German photographer Karl Heinrich Gutzlaff, who had previously worked with Henschel and Schleier. From that time on, Gaensly enjoyed a steady rise to success and acclaim as a professional photographer. In 1877, the year he won three gold medals from the Imperial Liceu de Artes e Ofícios (a vocational school founded in 1872) and the Academia de Artes, Gaensly founded his own business at No. 1, Ladeira de São Bento, a prestigious address in the city center. Called "Photographia do Commercio" (Commercial District Photography), its advertisements declared that the studio owned "the biggest collection of views of Bahia, *carte-de-visites*, Imperial prints, convex prints and larger portraits." In 1881, he participated in the Brazilian National Library's "Exposição de História do Brasil" ("Brazilian History Exhibition") in Rio de Janeiro (his name appears next to Schleier's on some of the photographs shown there). He also expanded his business that year, opening a larger studio called "Photographia Premiada de Guilherme Gaensly" (Guilherme Gaensly's Award-Winning Photography) at No. 92, Largo do Theatro (now Praça Castro Alves). His gold medals are proudly illustrated on the backs of his cartes-de-visite, which also proclaim that his studio produced "Reproductions and Enlargements with Full Quality—Plates Kept for Reproductions." His services ranged from portraits to commissioned work, such as the "Álbum da Estrada de Ferro Central de Alagoas, Maceió e Vila Imperatriz" on the Central Railway in the province of Alagoas (1882–1884). All of his known works are albumen prints.

In 1882, Gaensly entered into a creatively productive and enduring partnership with his former assistant and future brother-in-law, Rudolf Friedrich Franz (Rodolpho Frederico Francisco) Lindemann, and the firm changed its name to "Gaensly & Lindemann." (Little is known about Lindemann. He was born in Germany ca. 1852 and in 1870 he contributed photographs to illustrate the entry on Brazil in Émile Levasseur's *La Grande Encyclopédie*.) In 1894, Gaensly moved to São Paulo and opened a branch on Rua XV de Novembro, a famous street in the city center, leaving Lindemann to run the Bahia studio. For over 20 years, Gaensly worked for the São Paulo Tramway Light and Power Company (now Eletropaulo) and government agencies, including the Department of Agriculture. His partnership with Lindemann ended in around 1900, when Gaensly changed his firm's name to "Photographia Gaensly," also advertised as "Photographia Guilherme Gaensly."

In Bahia, Gaensly photographed numerous views of the outskirts of Salvador that are remarkable for their beauty, including fishermen's huts and canoes in

Gaensly, Wilhelm (Guilherme). *Ladeira de S. Francisco de Paula, Agua de Meninos, Egreja de S. S. Trindade, Ancoradouro. Acervo da Fundação Biblioteca Nacional, Brasil.*

the Rio Vermelho district before it became part of the urban landscape. His photographs are valuable historical documents of the city's development between 1865 and the 1890s. The National Library of Brazil in Rio de Janeiro houses 64 photographs by Gaensly in the D. Thereza Cristina Maria Collection. Most are views of Salvador. In 1895, Gustavo Koenig Wald published photos by Gaensly in *São Paulo 1895.* Between 1900 and 1910, Gaensly's studio produced several series of postcards on the city of São Paulo, as well as the Port of Santos and coffee plantations. During his years in that coffee-growing region of Brazil, he had photographed numerous plantations in rural São Paulo, including Araraquara, Ribeirão Preto, and Campinas, for the Department of Agriculture. According to art historian Vânia Carneiro de Carvalho, "In his portrayals of plantations, Guilherme Gaensly seeks to make the geometrical lines of the countryside coincide with the dividing lines of photographic planes. Movement is replaced with a rigorously analytical treatment of the image in which nature is framed in an orderly universe and rationalized production…. [We] see in photography the intention of monumentalizing its motif, whether through extreme close-ups or the immoderate addition of formal value to the motif, as well as the attempt to show it as an integral part of its surroundings." Researcher and photographer Pedro Vasquez observes that Gaensly's work for the São Paulo Tramway Light and Power Company "gave him an opportunity to develop his tremendous talent for landscape photography, which is wonderfully expressed in his ample documentation of the city of São Paulo's modernization process." Like Marc Ferrez, Benjamin Mulock, and Auguste Stahl, Gaensly's railway photography transcended his commissions in documenting the natural surroundings and even human aspects of the works he portrayed, which accounts for his photographs' lasting appeal. His talents were recognized abroad during his lifetime. He won a silver medal at the 1889 Exposition Universelle de Paris, where photography was featured prominently in the Brazilian pavilion (Lindemann also won awards that year for his views of Salvador and Recife). Gaensly received another silver medal at the 1904 World's Fair in St. Louis, Missouri, where Brazil's pavilion was a remarkable building with an octagonal dome designed by St. Louis architect Charles H. Deitering. Gaensly worked until about 1915 and died in São Paulo in 1928, after a long and successful career. Since 1975 his works have been shown in New York, Zurich, Berlin, Madrid, Rotterdam, Paris, and major Brazilian cities, including São Paulo, Rio de Janeiro, Campinas, Belo Horizonte and Brasilia. In addition to the National Library collection, they can also be found at the Moreira Salles Institute, the Joaquim Nabuco Foundation and the Patrimônio Histórico da Energia de São Paulo (São Paulo Historic Heritage of Power) Foundation in Brazil.

Sabrina Gledhill

Biography

Wilhelm (Guilherme) Gaensly was born in Wellhausen, Thurgau Canton, Switzerland, in 1843, to Jacob Heinrich Gaensly and Anna Barbara Kym Gaensly. His father became a fabric merchant and cotton exporter in Salvador, Bahia, and the family—including the five-year-old Wilhelm and brothers Ferdinand and Frederick—joined him there in 1848. Gaensly's sisters Julia and Alaine and at least two other siblings, Albert and Alwina, were born in Salvador. His former assistant Rudolf (Rodolpho) Lindemann became his business partner in 1882 and his brother-in-law in 1888, when he married Alaine Gaensly. Guilherme Gaensly wed Ida Elisabeth Itschner

on May 5, 1888, in a Presbyterian ceremony witnessed by Lindemann. In 1894, Gaensly and his wife moved to São Paulo. He ran a branch of "Gaensly & Lindemann" until the partnership was dissolved in around 1900, and continued working there until about 1915. He died in São Paulo on June 20, 1928, survived by Ida Gaensly, who lived there until her death in 1933.

See also: Ferrez, Marc; Henschel, Albert; Mulock, Benjamin; Stahl, Auguste; Landscape; Cartes-de-Visite; Card Formats: Minor Formats; Expositions Universelle, Paris (1854, 1855, 1867, etc.); and Albumen Print

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GALE, COLONEL JOSEPH (1830–1906)
English

Gale was a London architect and part-time soldier, serving with the 10th Surrey Rifle Volunteer Corps where he rose to the rank of Lieutenant Colonel.

Gale first took up photography in 1859 as an aid to his profession using a 10 × 8 inch Ottewill camera, later he used both stereo and panoramic cameras to make his studies. In 1866 Gale joined the Amateur Photographic Field Club whose 25 fellow members shared his interest in "mead and stream" subject matter, remaining a member until his death in 1906.

From 1879 he became a regular exhibitor at the Photographic Society's annual exhibitions, where he displayed examples of his favored pictorial subjects, which he largely took in the southern English counties of Berkshire, Surrey and Sussex, often in the company of fellow photographer and friend, George Davison.

Gale, who recorded the rapidly changing way of rural life at the end of the 19th Century, was noted for the quality of his work which he printed using albumen, gelatin-silver and platinum papers, he also produced lantern slides. Gale's best-known picture was the widely-published 1887 view "Sleepy Hollow," a classic naturalistic study of a pair of heavy-horses at a ford.

Gale was one of the first members of the Linked Ring, being elected in May 1892 and taking the pseudonym "Rambler."

IAN SUMNER

GALERIE CONTEMPORAINE

The cult of celebrity was fuelled, in France as elsewhere, by the ready availability of portraits of public figures. Essentially an urban phenomenon, the collection of visual representations of noteworthy persons pre-dates photography, and by the middle of the nineteenth century the commerce in engraved and lithographed portraits was widespread. The advent of photography, coupled with the growth in the popular press, led to further expansion in the phenomenon of celebrity portraiture, especially of stars of the Parisian operatic and theatre world. The public's taste for such imagery was catered for by serial publications such as *Paris-Théâtre*, founded in 1873, at 25 centimes per copy.

Another serial publication, *Galerie Contemporaine*, stands out due to its ambitious scope, as well as for the quality of photographic imagery it contained. Underpinned by a certain patriotic sentiment and a more sophisticated approach to celebrity, the subtitle *Littéraire Artistique* declares the work's focus of interest to be high art. In fact *Galerie Contemporaine* evolved into the most impressive set of celebrity portraits published in nineteenth-century France, forming a vital visual record of the leading figures who shaped public life, in science and politics as well as the arts, during the Second Empire and the emergent Third Republic.

Within its pages, some of the most emblematic portraits of the era appeared, such as Charles Baudelaire by Carjat, Alphonse Karr by Adam-Salomon and George Sand by Nadar. The usual claims to photography's superiority and importance for posterity are set out in the introduction to volume III: "Voilà pourquoi ce livre sera consulté plus tard, avec fruit; car le portrait dessiné, toujours suspect, même chez les peintres de génie, a été remplacé par la photographie, chose brutale, implacable, éminemment scientifique parce qu'elle est

indifférente" [This is why this book will be consulted later, with profit, because the drawn portrait, always suspect, even by painters of genius, has been replaced by photography, brutal, implacable, eminently scientific because it is neutral].

Galerie Contemporaine appeared weekly over a period of eight years from 1876 to 1884, under the imprint of Ludovic Baschet in Paris. Each issue comprised a biographical essay and accompanying portrait, reproduced in Woodburytype printed by Goupil (and the successor firm Boussod, Valadon & Cie for the final volume). The cover price per issue was a relatively high 1franc 25 centimes. Published in two concurrent sections or series—a first series "Littérateurs, Musiciens, Etc." and a second series "Peintres et Sculpteurs," probably appearing on alternate weeks, the work was subsequently bound up and re-issued in six monthly volumes comprising 26 issues, each volume containing separate title pages for the first and second series. Some biographies in the second series were spread over two or more issues, explaining the irregular number of portraits in some volumes. The full run amounted to a total of 241 portraits issued in 13 volumes. While the letterpress biography was essentially similar across both series, the illustrations differed, inasmuch as the subjects in the first series were each represented by a large format portrait hors texte, generally 24 × 18 cm, within an ornamental border, while the subjects in the second series were represented by a smaller portrait, on average 12 × 8 cm, mounted in with the text, as well an example of the artist's output, in a larger format print hors texte. Almost all these images of paintings and sculpture are reproduced directly from the original work, rather than after intermediate engravings or lithographs.

Since the letterpress matter was unpaginated, and the only table of contents was a cursory list of the celebrities featured on the title page to each series, collation is difficult and no standard bibliographical tool yet exists. Furthermore, individual part wrappers are undated. Much of the print run of the first edition must have remained unsold, since a second undated edition appeared as *Galerie contemporaine des illustrations françaises* under the imprint of Paul de Lacroix, in eight volumes containing between 126 and 141 portraits. Larger portraits from this edition can be identified as mounted on undecorated cardstock.

STEVEN F. JOSEPH

See also: Baudelaire, Charles; Carjat, Etienne; Nadar; Woodburytype, Woodburygravure; and Goupil & Cie.

GALTON, SIR FRANCIS (1822–1911)

Francis Galton, one of the most prolific and controversial polymaths in an age that had more than its share, was born on February 16, 1822, in Sparkbrook, near Birmingham, England, the youngest child of a prosperous banker and his boldly intellectual wife. After a suitably pampered upbringing, Galton began his formal education in earnest in schools in France and in England where he demonstrated his precociousness with measurement by tabulating the number and intensity of floggings administered by dour schoolmasters to unruly pupils. Following a brief tour of the Continent, a period of medical study commenced, first in Birmingham and then in the far more dynamic center of London, a pursuit which brought him into the orbit of a cosmopolitan and innovative scientific community. Restless, Galton moved for a time to Cambridge, where he studied mathematics with great difficulty. On his father's death in 1844, Galton, always somewhat uneasy in the academic environment, was left a fortune that obviated the need for a professional career and which would facilitate a series of adventures and inquiries, culminating six years later in a journey to map the interior of the African continent. He proved to be adept enough a topographer to record with accuracy the features of a large swath of southwestern Africa, as well as the dimensions of a number of native women, whose voluptuous forms the fascinated European measured with precision.

Upon his return to London, Galton's achievements were lauded by the Royal Geographical Society, to whose fellowship he was enthusiastically elected. Increasingly immersed in the scientific milieu of the metropolis, Galton married Louisa Butler, the member of a distinguished academic family, in 1853. Situated as he was in the midst of scientific activity, Galton was deeply influenced by the publication in 1859 of *The Origin of Species*, written by his cousin Charles Darwin, with whom Galton renewed his youthful friendship. The impact of Darwin's account on both science and social thought can hardly be overstated, and Galton was so intrigued by the prominence accorded to heredity in the success or failure of creatures that he began to ponder an entirely new type of experimental inquiry. Extrapolating from the agricultural breeding Darwin had used to demonstrate the integral relationship between natural selection and the forms of organisms, Galton asserted that such rationalized mating might be usefully applied to another group. Furthermore, Galton claimed, if physical prowess was dictated by hereditary processes, then mental abilities must equally be inborn: "[i]f a twentieth part of the cost and pains were spent in measures for the improvement of the human race that is spent on the improvement of the breed of horses and cattle, what a galaxy of genius might we not create!" (Brookes, 2004, 144). These were not merely idle theoretical observations, but a concrete program by which Galton imagined his nation could expedite the glacial pace of evolution. Galton continued to refine what he termed "eugenics"

throughout the 1860s, and codified it most comprehensively in his 1869 book *Hereditary Genius*.

By 1873, Galton had begun to seek a way to apply his insights in a practical manner, and the necessary first step would be an accounting of the nation's entire pool of human resources. Galton attempted to accumulate data from schools of every rank throughout England, but when his efforts were received coolly by these institutions, he turned to an acquaintance, Sir Edward du Cane, Inspector of Prisons, for assistance. Galton was furnished with photographs of convicts, which he quickly sorted into classes based upon the type and severity of their transgressions. With this raw imagery at hand, Galton wondered how he could distill the essential physical attributes of each of these classes, soon arriving at a novel method. By successively photographing eight images onto a single plate, in the same position and with an equal fraction of the normal exposure time, Galton found that a superimposed composite of all eight faces could be produced. This composite portrait was of remarkable value to Galton's project, for it obliterated the individual idiosyncracies of the men, but emphasized those features which they shared. This photographic enterprise, while technically innovative, remained conceptually dubious, for it seemed to confirm the long-held position, to which Galton subscribed, that certain physical manifestations were exterior correlates of mental or even moral states. Yet, what was most important for Galton was the fact that the photographic breeding that occurred during the course of these experiments seemed to offer a predictive value for the kinds of policies that his eugenics sought to institute. In an article of 1882, Galton described the prospective use of these works: "The easiest direction in which a race can be improved is towards that central type...there can hardly be a more appropriate method of discovering the central physiognomical type of any race or group than of composite portraiture" (Galton, 1883, 10).

Galton's use of composite photography ultimately lead to a number of related projects, as when he used the measure of deviation from this photographically deduced "central type" as the basis for a system of indexing portraits, so that the likeness of an individual could be easily encoded and disseminated, for example, to law enforcement agencies via wireless. Other enterprises derived from this innovation included the creation of supposedly definitive likenesses of historical figures based upon a composite rendering of their representations on coins and medals, and a procedure for measuring the distance between two points through a series of photographs taken from distinct viewpoints.

For Galton, photography seemed to provide a reliable means for securing the scientific validity to which his eugenic theories aspired, and was imagined to be an objective medium through which the physiognomic manifestation of human qualities could be envisioned in pure pictorial fashion. His photographic experiments proceeded from his fundamental misunderstanding of the nature of this mode of representation, as well as his deeply flawed notions of heredity and evolution. It was in the service of this suspect program that Galton's technologically inventive photographic experiments were employed, and to which his ambivalent legacy can be attributed.

JORDON BEAR

Biography

Sir Francis Galton was born on February 16, 1822 in Sparkbrook, near Birmingham, England into the comfortable household of Samuel Tertius Galton and Violetta Darwin Galton. After schooling in medicine and in mathematics, he embarked on a cartographic voyage to Africa in 1850, returning to London to wed Louisa Butler in 1853. Deeply influenced by the 1857 publication of Charles Darwin's *Origin of Species*, he began a series of studies in heredity and proposed a program of breeding he called "eugenics," which aimed to accelerate the evolutionary process of sorting out what he deemed to be the inferior characteristics of humanity. In an effort to determine and demonstrate the nature of these unfavorable traits, Galton acquired in 1873 photographs of prison inmates and employed an innovative process of composite photography, in which several images were superimposed onto a single photographic plate. A great diversity of photographic pursuits based upon this technique followed in the 1870s and 1880s. Upon his death on January 17, 1911, the problematic program in which Galton's photographic ingenuity was employed had begun to overshadow his technical achievement.

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GARDNER, ALEXANDER (1821–1882)

American photographer and philanthropist

Born on 17 October 1821 in Paisley, Scotland to James and Jean Gardner, Gardner was raised in Glasgow, Scotland by his mother after his father's death. Jean (Glenn) Gardner, was from an Ayshire family "of good standing" whose members included ministers, physicians, and farmers, and she single-handedly saw to the "training of the family." As a student, Gardner showed interest in astronomy, botany, and chemistry. At age fourteen, he apprenticed with a Glasgow jeweler, where he worked for the next seven years. During these early years of his life, he became concerned with the condition of the working classes and expressed his views on social issues, as well as on science in art, in the public press. After leaving the jewelry trade, he worked as the editor of *The Glasgow Sentinel*.

Inspired by Robert Owen, Gardner began planning his own utopia in 1848, writing out the colony's "schedule of duties with every minute particular." Established in Iowa by Gardner and his brother in 1850, the community prospered although Gardner returned to Scotland. In 1855, he finally emigrated to the United States, taking his mother, his wife, Margaret, and their two children with him, and they settled in New York. Mathew B. Brady paid for Gardner's fare to the United States though it is not clear why.

While there is a question of whether Gardner was trained in Scotland or America, his eulogy, printed in the *Philadelphia Photographer* in March 1883, suggests that Gardner's experiments in photography emerged from his interest in chemistry in Scotland. Already possessing knowledge of photography, Gardner was hired by Mathew B. Brady to manage his new Washington gallery as photographer and bookkeeper. Frequent portrait sitters at the studio included President Abraham Lincoln, whom Gardner admired, and Walt Whitman who called Gardner "mightily my friend" and "a real artist" who "saw further than his camera."

With expertise in the wet-plate collodian process (see wet collodian negative), Gardner became a member of Brady's corps of Civil War photographers, which also included Timothy Henry O'Sullivan and George N. Barnard. As a photographer for the Union army, Gardner took three-quarters of the pictures of the Army of the Potomac's advance, remaining with General George B. McClellan during the campaigns in Virginia. Gardner left Brady's group, however, in 1863 possibly over issues of authorship of photographs. Gardner then opened his own gallery in Washington and hired a group of photographers.

Civil War photographers relied on cumbersome equipment hauled by horse-draw wagons carrying glass collodian, silver nitrate, and developer; photographers used tents for development. In addition, images required a long exposure time. Thus, Gardner and others could not capture images of active battle but captured still landscapes and scenes of camp life. They made images in stereograph, cartes-de-visite, and large imperial formats.

Gardner's photographs also reached the public through a couple other venues, such as exhibitions and illustrated publications. Gardner's photographs of Antietam for Brady's studio, for instance, were exhibited within a month of the battle. A review in the *New York Times* on 20 October 1862 stated that Gardner's photographs brought the reality of the war to people's homes. Gardner also provided *Harper's Weekly* and *Leslie's Illustrated News* with photographs, which they copied and combined in illustrations for print.

In his two-volume publication, *Gardner's Photographic Sketch Book of the War* of 1866, Gardner had photographic albums in mind. Each volume contained fifty original Civil War photographs by Gardner, some of which were from his work for Brady. A caption supports each photograph, with text on the opposite page describing the scene and its significance. Concerned with accurate attribution of photographs, Gardner lists the name of the maker of the negative and the print below each image.

In introductory remarks, Gardner describes his *Sketch Book* photographs as "mementoes of the fearful struggle" and hopes for their "enduring interest" as war memorials. While many of the photographs show camp life and historic events, such as Lincoln's visit with McClellan at Antietam (1862) in Plate 23, the most memorable images depict the ravages of war. Among these images are Plate 36, "A Harvest of Death" (negative by T.H. O'Sullivan and positive by A. Gardner) and Plate 94, "A Burial Party on the Battle-Field of Cold Harbor" (negative by John Reek, positive by A. Gardner). Taken in Gettysburg, July 1863, "A Harvest of Death," shows the strewn bodies of soldiers on a field. Gardner's text places war within the natural environment:

> Slowly, over the misty field of Gettysburgh—as all reluctant to expose their ghastly horrors to the light—came the sunless morn, after the retreat by Lee's broken army. Through the shadowy vapors, it was, indeed a 'harvest of death' that was presented; hundreds and thousands of torn Union and rebel soldiers [. . .] strewed the now quiet fighting ground, soaked by the rain, which for two days had drenched the country with its fitful showers.

In "A Burial Party," taken on April 1865, Gardner shows us African Americans, probably soldiers, burying Union dead. In his text, one can hear Gardner's unequivocal support of the Union cause.

Because of the high cost of Gardner's *Sketch Book,* it failed commercially. Nonetheless, Gardner's career as a photographer continued to flourish with an expedition in the fall of 1867 to photograph the construction of the Kansas Pacific Railroad, Eastern Division, as it moved

Gardner, Alexander. Abraham Lincoln and His Son Thomas (Tad).
The J. Paul Getty Museum, Los Angeles
© The J. Paul Getty Museum.

westward to meet the Union Pacific. Gardner published these photographs in *Across the Continent on the Kansas Pacific Railroad* in Washington in 1868. From 1867 to 1880 Gardner photographed Indian delegates to Congress for the Office of Indian Affairs, and in 1873, he made a rogues' gallery for the Washington police.

Later in his life, Gardner devoted himself to philanthropic work for the Washington Beneficial Endowment Association and the Masonic Mutual Relief Organization (Washington, D.C.) for which he served as Secretary. Gardner died on 12 December 1882, but his work remains in collections at the National Archives, Library of Congress, the George Eastman House, and the New York Historical Society in the United States.

Francine Weiss

Biography

Alexander Gardner was born October 17, 1821, in Paisley, Scotland, but raised in Glasgow, where, as a teenager he apprenticed with a jeweler until he was in his early twenties. With knowledge of chemistry, Gardner experimented with photography and, after establishing an Owenite utopian community in Iowa in 1850, he settled in New York with his family in 1856 finding himself quickly hired by the photographer-entrepreneur Mathew Brady as the manager for Brady's Washington gallery. In the years before and during the Civil War, Gardner made his greatest contributions to photography with his many portraits of Lincoln, the last of which was taken in 1865 five days before Lincoln's assassination, and with his Civil War photographs, taken while working for Brady. In 1863, he left Brady to open his own gallery in Washington D.C., but his work as a Union photographer for Brady and as an independent photographer led to his publication in 1866 of a two-volume set of a hundred Civil War photographs, accompanied by text and captions, called *Gardner's Sketchbook of the War*. Containing images by Gardner and other Civil War photographers, these volumes documented

the aftermath of the war, as well as everyday scenes of camp life and other historic events. In September and October of 1867, Gardner photographed construction of the Kansas Pacific Railroad, Eastern Division publishing the photographs in *Across the Continent on the Kansas Pacific Railroad* in 1868. From 1867 to 1868, Gardner photographed Indian delegates to Congress for the Office of Indian Affairs, and in 1873 he made a rogues' gallery for the Washington D.C. police. As Gardner's interest in photography waned, he devoted himself to philanthropic causes through the Masonic Mutual Relief Organization in Washington D.C. and the Washington Beneficial Endowment Association until he died on 12 December 1882.

See also: Brady, Mathew B.; and War Photography.

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GAUMONT, LÉON ERNEST (1864–1946)

Born in Paris in 1864, from 1881 Léon Gaumont was employed in the workshops of Jules Carpentier, maker of precision instruments, who would later construct the Lumière Cinématographe. In 1894 Gaumont went to work for Felix Richard in his shop, the Comptoir General de Photographie, 57 rue Saint-Roch, Paris. (This had been founded in 1851 as the Maison Richard.) Gaumont bought the business in August 1895, in partnership with Gustave Eiffel, of tower fame, astronomer Joseph Vallot, and financier Alfred Besnier.

During the 1880s and early 90s several inventors and scientists around the world had become involved in sequence photography or 'chronophotography,' mostly for purposes of motion analysis. Some, fascinated by the possibilities of photographs that moved, had developed methods of re-synthesising motion from these sequences, leading to the development of cinematography. In 1895 Léon's company, named L. Gaumont and Co., started to manufacture and market the chronophotographic camera for unperforated rollfilm, and the Bioscope projector / viewer (previously the Phonoscope, now re-named) for sequence pictures mounted on a disc, both devised by Georges Demenÿ. Léon Gaumont obtained filmstock from Georges William deBedts, one of the earliest producers of cinematograph materials and equipment. However, these first Gaumont-Demenÿ machines were limited in their potential, and failed to find a market. Convinced of a future for the new moving image business, Gaumont was undeterred by this setback and was soon marketing new 60mm and then 35mm motion picture cameras and projectors—still based on the Demenÿ principle but now using perforated film—and these became very successful.

In the late 1890s Gaumont's young secretary Alice Guy directed films for the company, and Léon Gaumont experimented with Eiffel on "the new photography," X-rays. At the Paris Exposition of 1900, Gaumont displayed "prints, enlargements, and photographic processes." By now well known in the photographic business, Léon Gaumont was joint secretary of the second committee of the International Congress of Photography held during the Exposition, with responsibilities for the subject "Photographic Material." The Gaumont Company was at this time the principal agent for the Photo-Jumelles cameras of Jules Carpentier, and made and sold folding plate, vest pocket , detective, and stereoscopic cameras—with names including Block-Notes and Spido. Stereoscopic viewers were also produced and marketed by the company for many years, including the Gaumont Stereodrome; a salon stereoscopic viewer of superior optical and mechanical construction, for three standard sizes of glass stereoviews.

Every aspect of moving images engaged Léon Gaumont's fertile mind. In the late 1890s, long before the establishment of specially-built motion picture theaters, the manufacturers of motion picture machines and films were actively exploring the various possible outlets for the new medium. The domestic hobby market seemed ripe for potential if a simple-to-operate, relatively inexpensive, miniature system could be developed. The Gaumont Chrono de Poche launched in 1900 was an amateur cinematograph camera using a narrow-gauge (15mm) film with center-perforation; and was the first home movie camera to use a clockwork motor. The same 'beater' mechanism, which had served Gaumont so well, was also used for projection. At the close of the

century the company also manufactured and marketed various mutoscope flip-photo motion picture viewing machines, including the Lumière-Casler Kinora, a clockwork device for home entertainment.

From 1902 Gaumont gave demonstrations of mechanically synchronised motion pictures with sound. Léon Gaumont and his company continued to develop photographic inventions and devices, including sound and colour motion picture systems, throughout the early years of the 20th century. They maintained film production, distribution, and exhibition and Gaumont became, with Pathé, one of the top two companies in the cinema world. From 1905 to 1914 its studios at La Villette were among the largest anywhere. The name Gaumont survives in the twenty-first century motion picture business.

STEPHEN HERBERT

Biography

Léon Gaumont was born in Paris, France, on 10 May 1864. His father was Auguste Ferdinand Gaumont, his mother Marguerite Dupenloup. In 1888 he married Camille Maillard. A meticulous individual, Gaumont maintained a close involvement in all aspects of his business across the audio-visual field. He was evidently reluctant to delegate; a wide range of company letters of the period bear his signature. Léon Ernest Gaumont retired in 1930 and died at Saint-Maxime on 1 January 1946.

See also: Demeny, Georges

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GELATINE SILVER PRINT

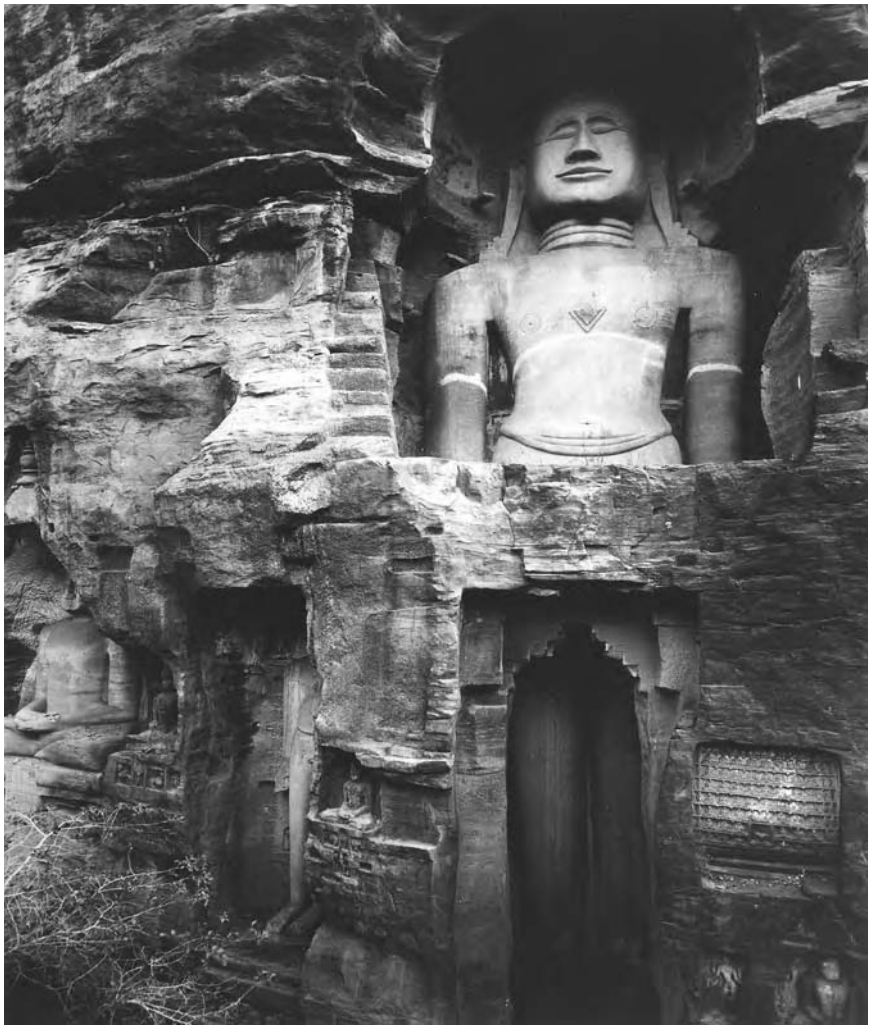
Gelatine silver papers evolved from a number of sources, including Richard Leach Maddox's work with silver bromide suspended in gelatine. These materials were also suitable for printing paper; the gelatine coating retained its permeability when dry, so that the paper could be prepared and sold ready-sensitized. The first commercial gelatine silver paper was silver bromide, predating gelatine silver chloride papers, which were produced in a variety of formulations in the early 1880s but not widely available until the next decade.

Variations in gelatine can affect photosensitivity; in the 1880s, inconsistent sensitivity slowed the acceptance of gelatine developing-out papers. In the late 1890s, Eastman and Company established special herds of cows fed on mustard plants to produce optimum photosensitivity in the gelatine made from their bones. By 1895, gelatine had replaced albumen as the standard colloidal binder for silver salts. As opposed to albumen, which contained residual sulphur compounds, gelatine was less likely to produce yellowing of the base highlights or sulphiding of the silver image.

Gelatine papers were made in both printing-out and developing-out formulas. An early silver chloride printing-out paper was introduced by William Abney in 1881. The addition of citric acid increased shelf life, and in 1884, Emil Obernetter began large-scale manufacture of pre-sensitized papers in Munich. Obernetter used baryta (barium sulphate in gelatine) as a subbing layer, providing a smooth surface to which the silver gelatine coating readily adhered. Printing-out paper had initial problems with the consistency of the emulsion, and its wider use only came in the 1890s with the development of continuous-roll coating machinery. Gelatino-chloride papers were often denoted as "aristo" papers; in 1891, Ilford called its version 'POP,' which has persisted as a generic nomenclature.

Developed-out silver chloride paper was proposed in 1881, when Guiseppe Pizzighelli published his work with Josef Maria Eder on the chemical development of silver chloride using new organic developers. In 1882, Dr. E. Just began limited production in Vienna, and subsequent improvements were introduced by Leon Warnerke, and Dr. Leo Baekland. In 1893, Baekland 's formula was used by the Nepera Chemical Company for 'Velox' paper (later popularized by Eastman Kodak). Such papers attracted the colloquial name 'gaslight' paper, as they could be handled under a red-shielded gas safelight and exposed by removing the shield and turning up the gas. Developed-out silver chloride could be contact-printed or exposed under an enlarger. Image quality was very good; a fine grain is typical of a silver chloride sensitizer. Gaslight paper was popular with amateurs and more generally used for commercial documentary and studio work.

In 1883, Eder reported a mixed emulsion developing-out paper of about 60% silver chloride and 40% silver bromide. It was one-twentieth the speed of silver bromide, but much faster than pure silver chloride and easier to control than pure silver bromide. In 1890, Ilford reintroduced 'Alpha' paper as chlorobromide gelatine. Mixed emulsion papers remain the standard for modern black-and-white photographic printing, marketed as variable contrast papers.



Unknown, Unknown School. Large Shrine Figure in Happy Valley, Gwalior, India.
The Metropolitan Museum of Art, Purchase, Cynthia Hazen Polsky Gift, 1993 (1993.126) Image © The Metropolitan Museum of Art.

Printed-out silver chloride paper was typically glossy; a matt finish could be produced by squeegeeing the print face down on a sheet of ground glass and allowing it to dry *in situ*. This was common practice; platinotype and bromide papers had encouraged a preference for matt prints. In the early 1890s, matt developing-out papers were manufactured with rice starch and resin (shellac). In addition, the baryta substrate could be embossed to provide a textured finish. Chlorobromide paper usually had a matt and/or textured surface finish.

Printing-out papers show a warm brown colour (unless toned), because printed-out silver is deposited as small, spherical particles of metallic silver, which absorb blue light and reflect yellow light. Since brown is really a dark yellow, light reflected from spherical particles is perceived by the human eye as having a brown hue. 'POP' papers were usually gold-toned, giving a colder, purple-brown colour, and many 'self-toning' papers were manufactured with integral gold chloride. This was further moderated by a tinted blue-grey or lavender-grey baryta substrate, which suited the primary application of POP for commercial portraiture. The paper was also used for proofing negatives and printing early snapshot photographs.

Developing-out paper tends to a neutral-black image colour (unless toned), because developed-out silver is deposited as a tangle of filamentary silver whose light absorbing properties produce the appearance of a neutral-black hue. But platinum and bromide papers had established the taste for a colder image colour, which manufacturers produced in gaslight papers by modifying emulsion chemistry and developers. Gaslight paper responded well to a variety of developers; gallic acid gave a greenish-black to brown image colour, while hydroquinone and ammonium carbonate created a warm red. Additionally, decreasing the exposure time and increasing development affected the grain structure of the silver and shifted the hue towards black. Chlorobromide produced a warm-neutral black, but could be developed for brown tones, which were emphasized by an ivory or cream tinted paper base. These attributes suited portrait work, for which chlorobromide papers were typically used.

In the 1850s, platinic chloride was proposed for

toning silver chloride prints: gold toning was relatively expensive, and platinum was one-third of the price of gold. In 1889, Lyonel Clark improved the toner by substituting potassium chloroplatinite. Platinum gave rich black tones to manufactured papers and was employed from about 1895 until the early 1920s, sometimes combined with palladium (particularly for homemade chloride papers). In the 1890s, uranium nitrate toning was used for purple to red-brown colours, ferric ammonium citrate for browns, and traditional thiocyanogen or gold chloride for a violet-black hue. Other toning compounds included copper (for red), iron salts (Prussian blue), and vanadium (green). Sepia toning with sodium sulphide was not adopted until the early 1900s.

Silver gelatine papers show oxidative-reductive 'tarnishing' from acids (from handling or airborne pollutants), and staining and sulphiding from residual fixing chemicals. The gelatine can display moisture damage, evident in dull patches on the print surface, spots of mould, and delamination of the gelatin binder.

HOPE KINGSLEY

See also: Bromide Prints; Eder, Joseph Maria; Enlarging and Reducing; Eastman, George; Maddox, Richard Leach; Platinotype Co. (Willis & Clements); and Warnerke, Leon.

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GENRE

As a category of subject matter in painting, genre refers to incidental scenes of everyday life. In photography, the term further suggests the artificial re-creation of such scenes for the camera (rather than the more direct recording of actual subject matter as in documentary or snapshot photography). Often associated with Victorian art photography, genre photography typically involves the staging of a narrative tableau, using paid or amateur models to enact familiar themes.

From the French for kind or variety, the word genre first designated the various kinds, or genres, of painting subordinate to grand manner history painting in the eighteenth-century academic hierarchy (such as landscape and still life), before acquiring its more restricted meaning in the 1790s (Stechow and Comer, 1975–6, 90). The terms high and low genre are sometimes used to distinguish between scenes of bourgeois life and peasant life. The initial popularity of such everyday themes in the art of the seventeenth-century Dutch Republic can be linked to the appearance of a moneyed merchant class, which in its painting preferred humble images of daily existence with subtle moral overtones to courtly or religious display.

In the decades prior to photography's invention, interest in genre painting surged internationally, spurred by the Enlightenment and industrialization. Reputations of Dutch seventeenth-century and French eighteenth-century painters previously deemed minor rose dramatically, and pictures of ordinary subject matter were collected widely, influencing trends in nineteenth-century painting up to and including impressionism. For example, the Scottish painter Sir David Wilkie modeled his work of the early nineteenth century on Dutch and Flemish seventeenth-century painters of peasant scenes such as Adriaen van Ostade and David Teniers the Younger. For early photographers, conventional genre subjects in painting similarly offered a source of recognizably "artistic" or "picturesque" images, while avoiding the pitfalls of more lofty subjects such as moral allegory, which, many critics argued, went beyond the proper scope of photography. Exemplified by the work of Henry Peach Robinson, who hired models to portray rustic farm workers, such scenes of everyday life in nineteenth-century photography could be elaborately constructed affairs. Made deliberately to achieve artistic effect, genre photographs were thus enmeshed in conflicting, and shifting, aesthetic debates about both painting and photography.

Though he did not use the term, William Henry Fox Talbot clearly referred to genre painting in his 1844 *Pencil of Nature* with his image entitled *The Open Door* (Plate VI). A self-consciously artistic study of light and texture, it shows a rustic cottage door with a bristle broom poised diagonally in the foreground. In the adjacent text, Talbot declared, "We have sufficient authority in the Dutch school of art, for taking as subjects of representation scenes of daily and familiar occurrence" (Talbot, 1969). Talbot here linked the incipient art of photography with contemporary esteem for Dutch painting while, visually, borrowing the motif of the broom, propped precariously at an angle, directly from seventeenth-century works by Pieter de Hooch and others (Chiarenza, 1975, 24).

Other early calotypists enacted scenes "from life" modeled on Dutch and other genre paintings. David Octavius Hill and Robert Adamson's *Edinburgh Ale* (1843–46), remarkable for the seemingly animated

Greene, John Beasley. Mariette's Excavations to the Left of the Sphinx. *The Metropolitan Museum of Art, Gilman Collection, Purchase, Anne Tenenbaum and Thomas H. Lee Gift, 2005 (2005.100.276) Image © The Metropolitan Museum of Art.*

poses and expressions of its three drinking figures, was derived from scenes of jolly drinking companions in the work of a number of Dutch painters (Graham Smith, 1983). In France starting in 1841, Charles Nègre executed a well-received series of photographs of child chimney sweeps, a characteristically "low genre" theme found in painting. In such cases, photographic scenes that seemed to show a slice of life were in fact carefully posed, owing in part to long exposure times. As in genre paintings, the suggestion of everyday life in photographs was often achieved by highly deliberate means.

The Victorian art photographer Oscar Gustav Rejlander summed this up when he wrote that a photographer should look for his subject matter "in his daily life" at the social table, at a ball, an assembly, in the streets "and if he wishes to produce what he has seen, he can do so in the studio afterwards" (Spencer, 1985, 71). While Nègre and other calotypists had worked out of doors, Rejlander, along with his student Henry Peach Robinson, reenacted scenes of daily life in their studios. Throughout the 1860s, Rejlander produced photographs of street urchins in the studio; whether the child models in these urban genre scenes were actually from the street is unclear (Spencer, 1984, 18). Robinson, often making use of combination printing, specialized in rural scenes. Both photographers had much greater success with such subjects than with their more overtly contrived literary and allegorical pictures. With its perceived realism, photography was deemed by critics to be capable of rivaling the work of genre painters, even as those same critics condemned photographic attempts at High Art. "We may have a photographic Teniers," wrote one in 1856, referring to the Flemish painter of peasant scenes, "but not a photographic Raphael" (*The Journal of the Photographic Society*, 1856, 46). In addition to Rejlander and Robinson, many notable British photographers of the 1850s and 1860s, among them Roger Fenton, Lewis Carroll, and Viscountess Clementina Hawarden, staged narrative incidents of domestic life for the camera.

For the late nineteenth-century Pictorialist movement, artfully constructed "slice of life" scenes again constituted a central motif, as in the early work of Alfred Stieglitz. His *Paula* (1889) seems to capture a woman unawares as she writes a letter, light streaming in from a nearby window. The image, despite its naturalism, has been shown to correspond to similar themes in Dutch painting, and to show other signs of clear contrivance on the part of Stieglitz (Hulick, 1993).

With the advent in the late 1880s of snapshot photography, which offered the possibility of truly spontaneous images of daily life on a mass scale, genre remained a distinct approach, identified with the tradition of art photography. Writing in 1901, Frank Meadow Sutcliffe defined "Genre photography" broadly as the arrangement of figures to suggest an implied narrative. According to Sutcliffe, genre subjects might be drawn from imagination, literary or artistic sources, or from observation. In any case, they offered the photographer the challenge of composing an image that could convey a sense of momentary action. The photographer might at first have difficulty realizing his conception, he wrote, but "with a little practice he will soon learn the tricks of his trade and place his figures so naturally that his friends and critics will mistake his composition for a lucky snapshot" (Sutcliffe, 1980, 129). Despite superficial similarities, the carefully executed genre photograph was anything but a "lucky snapshot."

STEPHEN PETERSEN

See also: Art Photography; Hill, David Octavius, and Adamson, Robert; Nègre, Charles; Pictorialism; Rejlander, Oscar Gustav; Robinson, Henry Peach; Sutcliffe, Frank Meadow; and Tableaux.

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GENTHE, ARNOLD (1869–1942)

German photographer and studio owner

Arnold Genthe was born in Berlin, Germany in 1869. Upon completion of a degree in classical philosophy at the University of Jena, Genthe took a job as a tutor in San Francisco, California. While in San Francisco, Genthe became fascinated by its Chinatown neighborhood. He taught himself photography to accurately capture its residents. These early photographs are among his most well-known work. In 1897 he opened a studio and began to photograph celebrities, society people, and the changing face of the city, including photos taken in the immediate aftermath of the 1906 earthquake. In 1911 Genthe moved his studio to New York, where he focused mainly on portraits of the wealthy and well-known. He photographed modern dancers and film stars, including Isadora Duncan and Greta Garbo, and became well-known for those images. His portraits were unposed and artistic, mainly in the pictorialist, romantic style, and often used intricate lighting and soft-focus. Genthe was an early experimenter with color photography, and first exhibited color autochromes in 1911. Although primarily known for portrait work, Genthe documented his travels to Japan and Guatemala, and published a book of photographs of New Orleans. Arnold Genthe died on August 9, 1942 in New Milford, Connecticut.

JENNY GOTWALS

GEOFFRAY, STÉPHANE (1827–after 1895)

French lawyer, banker, and photographer

Born on 17 April 1827, in Roanne, France, Stéphane Geoffray was the son of Antoine Geoffray, a confectioner, and Claudine Julie Chavalland. Although he went by the name of Stéphane, his actual first name was Étienne.

Nothing is known about Geoffray's childhood. From 1852–1854, he apparently studied law in Rouen. By May 1855, he was established as a lawyer in Roanne, at 8, rue du Collège. He took up photography around 1850–1852, using the waxed-paper negative process of Gustave Le Gray from 1852–1854.

Most of Geoffray's renown as a photographer stems from 1854–1856, when the wet-collodion process was superseding the paper negative process. During this period, he wrote technical articles aimed at making paper a viable alternative to glass.

Geoffray's first procedure, published in 1854, was known as the cerolein process and was modified from Le Gray's original waxed-paper negative process. However, instead of saturating the fibers of the paper with melted beeswax prior to iodizing, as Le Gray had done, Geoffray first boiled the wax in alcohol, causing it to separate into three constituent components: cerotic acid (cerin), myricin, and cerolein. Upon cooling, only the cerotic acid remained in solution (which Geoffray consistently, but inexactly, called "*céroléine*") and the re-solidified myricin and cerolein were filtered off. Iodizing consisted of a second, alcohol-based iodizing solution being blended with the cerotic acid solution and sheets of paper being plunged into the bath, followed by drying. The sensitizing, developing, and fixing steps were similar to the waxed-paper negative process—with an additional final waxing step, utilizing the leftover myricin and cerolein.

This procedure had two advantages over Le Gray's: first, granularity and image definition were improved because the iodizing chemistry was directly dissolved in the cerotic acid solution; and second, the time required to iodize, sensitize, and develop the negative was greatly reduced.

Following the publication of Geoffray's procedure, a debate arose as to whether or not it was justifiably

different from Le Gray's. Acknowledging its benefits, Le Gray insisted that it was not a separate procedure but a simply a modification of his own. Maurice Lespiault criticized Geoffray's procedure for not being able to keep very long, but G. Roman and A. Cuvelier were pleased with it.

In early 1855, Geoffray published another cerolein procedure—primarily intended for glass, but also for paper. This consisted of collodion mixed with cerotic acid, the latter contributing to a thicker and more resistant coating. Geoffray also mentioned that the formula made collodion easier to spread on paper.

In his 1855 *Traité pratique pour l'emploi des papiers du commerce en photographie*, Geoffray lamented the contemporary state of paper production and discussed the steps needed to manufacture paper for photographic purposes. He also suggested methods for purifying paper for photographic purposes, alleviating stains caused by metal particles, and sizing.

In 1856, Geoffray published two more paper processes, stating his determination to find a paper process that would rival collodion on glass.

The first was a dry-paper process adapted from Jean-Marie Taupenot's 1855 collodio-albumen process. Here, a sheet of paper was sensitized twice: the first coating formed a lower layer of silver chloride in starch sizing; the second, an upper layer of silver iodide in albumen. According to Geoffray, after the exposure of the negative, the lower layer containing silver chloride would be more printed-out by the actinic action of light than the silver iodide layer; from this, he surmised that the silver chloride layer was less influenced by the subsequent process of development, isolating the upper silver iodide layer and contributing to a reduction in exposure time and an improvement in definition.

The second process required a preliminary step in which sheets of paper were soaked in a solution of gutta-percha dissolved in benzene and hung to dry. (The gutta-percha formed an impenetrable coating that kept the later formation of a light-sensitive surface entirely suspended above the paper—further augmenting light-sensitivity and precision of detail.) Next, a weak paste of glycerin was applied to a sheet of glass, and a sheet of the prepared paper was placed upon it. Iodized collodion was spread over the sheet of paper adhering to the glass, and the paper was removed and plunged, face-up, into a silver nitrate bath. The sensitive surface having been formed, the paper was briefly rinsed in water and replaced upon the glycerin-coated sheet of glass. Following exposure, development, and fixing—which were identical to the wet-collodion process—the paper was removed from the sheet of glass and washed, dried, and waxed like a typical paper negative. Geoffray claimed that photographs made using this process were indistinguishable from those made on glass.

In 1857, Geoffray complained of being too busy practicing law. From 1857–1873, he does not seem to have been very active as a photographer, remaining in Roanne and rarely travelling to Paris. In 1859, he married Marie Virotte, and that same year they had a son, Jacques Félix Geoffray. In 1864, he was listed as a banker in Roanne, in addition to being listed as a lawyer. In 1867, he exhibited prints in the *Exposition universelle*.

In 1874–1875, Geoffray returned to photography, making illustrations and writing articles for a short-lived archaeological journal entitled *Le Forez illustré*. This was the realization of a persistent goal in Geoffray's photography: documenting historical architecture in the environs of Roanne. Each cover featured a photograph made by Geoffray. The first issues consisted of albumen prints pasted on the covers, but by 1875, he had switched to making photographic prints on a press.

In the summer of 1875, Geoffray returned to Paris and established a photo-lithographic press at 40, rue d'Enfer. Apparently, he renounced the practice of law and banking, in order to devote himself to photography. In 1876, he and his family moved to 92, boulevard de Port Royal, where they lived until 1881.

From 1879–1881 Geoffray wrote and published a book on archaeological remains in the region of Roanne, *Iconographie des départements. Loire (Ancien Forez)*, illustrated by his photographs. His son made the prints on a typographic printing press. Therein, Geoffray expressed his photographic aesthetic: photography was a tool to document old artifacts *in situ*, before they were vandalized or removed from their original contexts

In the 1880s, Geoffray resumed writing technical articles and manuals. These addressed photomechanical reproduction, gelatin-bromide emulsions, and stripping negative emulsions from original supports. As late as 1880, he still voiced a preference for paper, writing, "Paper is for me, the support of predilection."

After 1895, there is no record of Geoffray. The last record bearing his name pertains to the death of his son on 14 November 1895.

Alan Greene

Biography

Stéphane Geoffray was born on 17 April 1827 in Roanne, France. A lawyer and banker, he took up photography in the early 1850s. In 1854, he published a variant procedure of Le Gray's waxed-paper negative process, inaccurately called the cerolein process. In 1855, he published a book on the manufacture of paper for photographic purposes; and in 1856, two negative procedures aimed at making paper a viable alternative to glass. From 1857–1873, Geoffray appears to have left photography for other pursuits; but in 1874, he returned to photography in order to start an archaeological journal

featuring his photographs of architectural ruins in the environs of Roanne. Just about all of his photography addressed the theme of the preservation of historical architecture. In the 1880s, he resumed writing articles and manuals, addressing the photo-technical concerns of the day and voicing a continued preference for working with paper negatives. Following a record dating to 1895, nothing is known about the remainder of his life.

See also: Le Gray, Gustave; Waxed Paper Negative Processes; and Wet Collodion Negative.

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GEOLOGY

Photography's function in the historiography of earth science is peculiarly complex. Geology as a modern discipline emerged in late eighteenth-century Europe from what had been a broad array of philosophical inquiries into nature. Conservative accounts of the earth's age came under particular scrutiny as the empirical evidence in the field indicated that millions and not merely thousands of years had past since the planet's beginnings. Theories of origin focused specifically on opposing arguments of the neptunists and plutonists, involving massive underwater and volcanic generations of earth forms, respectively, and whether cataclysmic events during relatively short intervals had contributed to the extremes of the terrestrial surface (*catastrophism*). By the middle of the nineteenth century most geologists had come to embrace variations of the notion that relatively uniform conditions over time were responsible for present-day appearances (*uniformitarianism*), though precisely what circumstances of movement had taken place were still under considerable debate.

Several kinds of delineation for the credible illustration of rock stratification, coastal formation, mountain building, and other forms of geological curiosity had been established during this period. Landscape painting and drawing, part of a growing interest in travel and topographical survey and aesthetic regard for the spectacle of nature, also served as background for the geological and geographical comprehension of the planet. Thus, by the time of photography's first decades, the ground had been broken for both symbolic and realist visual communication. The cultured society that recognized geology as an important scientific discipline also realized the importance of a medium that could record things in minute detail (e.g., Fox Talbot, Daguerre, Herschel, Arago). In 1841 Robert Hunt published his *A Popular Treatise on the Art of Photography*. A geologist himself, Hunt called his readers' attention to the possibilities of the camera as applied to nature. The art critic and amateur naturalist John Ruskin wrote passionately and often knowledgably about rocks, mountains, and glaciers. Although later unfavorably disposed toward photography as a form of artistic expression, Ruskin had practiced daguerreoptypy from the late 1840s to the mid 1850s, producing some of the earliest instances of Alpine scenery.

The photograph began to fulfill its promise as a mode of documentation when landscape photography and expeditionary work converged at mid-century, proving important not only for theoretical science, but also for reconnaissance, economic development, and territorial appropriation in the cause of nationalist and imperialist interests. By the 1850s Britain, continental Europe, and the United States each had scientific organizations that served to advance geological research. Studies of sediment and erosion, rock and fossil distribution, glacial action, valley and mountain formation were all subjects of domestic field work and theorization. Such subjects appear as intentionally selected in the work of both professionals and serious amateurs who explored the rocky coasts of Britain, the rugged terrain of Wales, and the great massifs of the Pyrenees and the Alps. John Dillwyn Llewelyn evinced his scientific background in his photographs of the Cornish peninsula. John Stewart, brother-in-law of Herschel, exhibited pictures of the Pyrenees in 1852 to the glowing acclaim of the photographic community, while the Alps occupied the attentions of William Bedford and William England. In France, Auguste-Rosalie Bisson, brother of fellow practitioner and partner Louis-Auguste, received attention for his photographs taken in 1862 on his second attempt to ascend Mont Blanc. In an effort to convey the spectacle and physical extent of the ranges beyond the capacity

Fennemore, James. Mukuntuweap Valley (Zion Canyon), Utah. *The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.*

of a single picture, operators like the Bissons devised ways to secure multiple views that, when assembled in total, comprised a panoramic vision evoking the original encounter. The French geologist Aimé Civiale provides an especially intriguing case of the use of panoramas with specific correlation between photography and geology. He produced hundreds of views in the Alps and Pyrenees between 1859 and 1866, including carefully calculated multi-plate panoramas designed to elicit a sense of spatial presence of the ranges from a full 360 degree scope.

The majority of wilderness and expeditionary photographers generally had multiple intentions for their exploits; undoubtedly many understood that photographs of geological phenomena might have importance for the support of theoretical discussion as well as visible authentication of regions of political and economic concern. Samuel Bourne, who had established himself as a commercial operator in Simla with partner Charles Shepherd in 1863, undertook his third photographic expedition into the Himalayas in 1866 with the British surgeon and amateur geologist George Rankin Playfair. Playfair directed Bourne to focus on specific "curious" and "singular" geological formations, some of which were directly linked with descriptions of the renowned geologist Charles Lyell. Robert Schlagintweit, one of several German brothers who traveled to India and the Himalayas and Central Asia lent his knowledge of photography to their scientific expeditions. The photographs from such projects became available to the scientific community and the interested public either through detailed reports, as in the case of the Schlagintweits, or through the acquisition of individual prints and albums of selected views, as in the case of Bourne.

The U.S. government sponsored a number of important surveys immediately following the Civil War, several of which were led by men with considerable knowledge of latest geological controversies. Clarence

King, who had trained with the renowned Swiss naturalist Louis Agassiz, clearly understood the desirability of having a photographic record of his expeditions along the 40th parallel (1867–69; 1872), since he recruited the experienced Timothy O'Sullivan for his campaigns into the Great Basin of the American West. King's catastrophist ideas were considered by the majority of the progressive scientific community as outmoded. Nonetheless, King's reports and O'Sullivan's startlingly austere photographs would appear to support the argument of relatively sudden traumatic upheaval of the earth's surface. Like his fellow geologist Ferdinand V. Hayden, who employed the photographer William Henry Jackson on his own surveys of the West (1870–78), including Yellowstone, King had to gain government support for his scientific activities by demonstrating the economic potential of mineral-rich areas of the wilderness. Photographers thus engaged in geographical exploration could serve both pragmatic and speculative roles in the gathering of evidence for specific geological study. Yet the photographic securing of imagery of the earth in its extreme forms also signaled artistic and emotionally evocative inclinations present in the nineteenth-century cultural imagination.

GARY D SAMPSON

See also: Bedford, Francis; Bisson, Louis-Auguste and Auguste-Rosalie; Bourne, John Cooke; Civiale, Aimé; Daguerre, Louis-Jacques-Mandé; England, William; Herschel, Sir John Frederick William; Jackson, William Henry; Llewelyn, John Dillwyn; O'Sullivan, Timothy Henry; Schlagintweit, Hermann, Adolph, and Robert; Stewart, John; Talbot, William Henry Fox; Documentary; Expedition Photography; Landscape; Mountain Photography; Panoramic Photography; Science; and Survey Photography.

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GERMANY

Until the year 1871, when the Second Emperorship was installed by the Prussian King, it was nearly impossible to name Germany as a political, economic, or social unit. Before this date one had to consider the German speaking countries, with the exception of the Swiss republic and the Austrian kingdom, as a loosely woven carpet consisting of dozens of minor kingdoms, dukeships, and counties. The two largest countries were the kingdoms of Prussia and Bavaria—and they, especially their capitals Berlin and Munich, played the most important roles in early German photography which is distinguished as such here only for reasons of linguistic practicability.

When the first announcements of photography arrived from Paris in German papers by January and February of 1839, there were lots of expectations among scientists and journalists which were widely discuseed in numerous articles and booklets. Academies began to discuss the science and art of depicting nature with light which had no name yet. The astronomer Johann Heinrich von Maedler was among the first to use 'photography' in the Berliner Zeitung of February 25, 1839, and a little later some entrepreneurs immediately started with their own experiments. Among those who could claim to have 'invented' a photographic method of their own were the Munich professors Carl August Steinheil and Franz von Kobell; another one was the inventor Johann Carl Enslen, then 80 years old.

An important role for the introduction of photography in Prussia was fulfilled by the scientist Alexander von Humboldt who had seen a number of daguerreotypes at a presentation on January 7, 1839, in Paris and had written several letters and articles about them. When William Henry Fox Talbot was about to claim the continental patent rights for his invention, Humboldt had already set the critical limits for looking at photographic images by insisting on the extreme sharpness in drawing details "that no painter would draw." Humboldt's words were so clear about photography's first and only quality in the depiction of detail that the calotype with its aesthetic roots in pictorial painting had no chance in German countries for nearly two decades.

Those who had heard of the stunning qualities of the daguerreotype had to wait until August 18, 1839, to see the new method presented to the public and the first equipment sold. Among the first to order a set of cameras, plates, and chemicals was the Berlin art dealer and entrepreneur Louis Ferdinand Sachse—but when his material arrived in Berlin everything was broken and inoperable. Thus the fame of having produced the

first German daguerreotypes was divided between Carl August von Steinheill who exhibited his daguerreotypes in early September 1839 and Johann Christian Gottlieb Noerrenberg, Professor of Astronomy at the University of Tuebingen whose oldest daguerreotype is said to have been developed in the same week and still exists today. Sachse's apparatus was repaired fairly quickly which allowed him to take part in the burgeoning photographic movement. In fact, from the end of September 1839 on, a number of amateur photographers successfully produced their first images in Berlin.

Except for the near total exclusion of the calotype, the early German photographic history reads like the ones of the neighbouring countries. One can draw a map of the wandering daguerreotypists; there is a certain emphasis on the south west and the far north areas where more portraitists seem to have rambled around than in the vicinity of larger cities like Munich, Leipzig, or Berlin. From 1845 on, the first studios were opened; by the early 1850s, each city address book listed large quantities of photographers offering portraits, corps pictures, and—with the success of the wet Collodion process from the mid 1850s onwards—scenic views of landscapes, famous buildings and mediaeval towns. The development of German industry followed the United Kingdom and France, and thus the subjects of German photographers participated in portraiture and landscape photography until the late 1850s.

Compared to other European countries and seen from the aesthetic side of the craft, Germany lacked fathering figures for the first two decades of photography. There was no William Henry Fox Talbot, no association like the one of David Octavius Hill and Robert Adamson, no Barbizon school. Nothing in Germany could be equalled to these geniusses. Among the better daguerreotypists are Carl Ferdinand Stelzner and Hermann Biow from Hamburg, Bertha Wehnert-Beckmann from Leipzig, Alois Loecherer and Antonia Correvont from Munich, and finally, Trudpert Schneider and his sons Heinrich and Wilhelm from Ehrenstetten near Freiburg. All of these photographers were far better than the average craftsman in their field but none of them could be called a world-wide first rate photographer. With their series on the damages caused by the Great Fire in Hamburg in May 1842, Carl Ferdinand Stelzner and Hermann Biow are certainly among the first men to use photography for journalistic purposes. Unfortunately, with the exception of a few singular images by Biow, this series is said to be lost as Hamburg's senate could not decide to buy them, as the records claim, due to "the possible lack of durabilty" of this new kind of imagery.

Even from the technological view of the matter, Germany had nothing more to offer than improvements of inventions made somewhere else. But from the 1850s onwards, these improvements were substantial both in optics and in the chemistry of photography. The German optical industry was initiated by Emil Busch's takeover of his uncle's firm at Rathenow near Berlin in 1848. By 1852 the business not only produced lenses with the help of steam engines but opened a department that manufactured camera bodies of all kinds. In 1852, Jakob Wothly from Aachen successfully licensed his own printing process. In 1854, Eduard Liesegang opened his first photographic studio in Elberfeld (today: Wuppertal) which subsequently became the first wholesale retailer for chemicals and apparatus. By 1857 the company started albumen paper production, and a year later started to manufacture cameras and lantern slide projectors and by 1863, the company moved to Duesseldorf where it still resides. The German photographic industrial concentration on mechanical engineering, optical specimen, and chemical production was developed from these earlier enterprises. Although larger parts of this industry were not installed before the late 1870s and early 1880s, these beginnings in the 1850s show all significant focal points for future developments.

The 1860s saw a formative disposition in German photography due to both the political developments and the growing tourism within German countries. Portrait photography centered around Munich, Berlin and Hamburg as there were the larger groups of very important people to be included in albums of contemporaries—a European fashion from the late 1850s onwards which helped to install a collective memory with the even larger success of the carte-de-visite and cabinet formats. The most important German contribution to this genre was formed by a long series of photographs portraying the members of the Frankfurt parliament of 1848, the first attempt of a democratic government ever within these states. Hermann Biow from Hamburg began the task of depicting the 831 elected parliamentarians; later he was followed by Jacob Seib from Frankfurt and Phillip Graff from Berlin. As all of them worked in the daguerreotype process their resulting images had to be transferred into drawn lithographs which were printed and sold in large quantities throughout all German countries. Seven years later the next series of its kind was released but the political landscape had changed considerably . And in 1856, Franz Hanfstaengl portrayed in his 'album of contemporaries' the royal suite of the Bavarian King Maximilian II, royalties and courtiers.

Additionally, photography began to merge with the growing interest in tourism from the 1850s onwards. Along the Rhine and the Elbe, in picturesque cities like Frankfurt on Main and Dresden, around important buildings like the Cologne cathedral and the Heidelberg castle, one could find entrepreneurs who not only produced images but sold them with their own publishing houses and printing presses. Hermann Emden in Mainz started this business successfully in 1856 as one of the

earliest of these entreprneurs, as did Carl Friedrich Mylius in Frankfurt on Main, Theodor Creifelds in Cologne, Hermann Krone in Dresden and Joseph Albert in Munich. Their fame spread far over the souvenir kiosks in their home towns which helped them pursue careers in photography. As Germany was still divided into many small countries, the photographers usually first dedicated an album of their photographs to their king, duke, or baron, and then hoped to sell even more of these precious specimen.

A secondary effect of these developments was the rise of the economic situation of photographers in general which helped them to establish their own professional groups and societies. Although primarily concerned with scientific and technical developments within photography like the 'Berliner Photographische Gesellschaft' founded in 1864 by Hermann Wilhem Vogel, these groups gave themselves the image of a guild and thus grounded the constitution of photography as a craft which finally was installed by law in 1902 and established as a profession until the 1980s. Although many of these pre-guild congregations did not live for longer than a few years and did not gain influence farther than their local district area, they formed the average image of photography in both the German language and the public opinion. Still today there is the legal division between a 'simple depiction' of reality and the 'work of art' in photography causing courts to investigate cases of copyright which stem from these formative years of photography.

The most important concern of these guild-like groups was a social notion: the institutionalisation of photography as a business, and respected like any other. Exhibitions were arranged, as were gatherings in upper-class hotels, and symposiums of all kinds where everybody could see that photographers were people to be taken as seriously as civil servants or dealers of antiquities. Carefully avoided in those circles was any reference to photography as a fine art which was given a pejorative notion—those who could not survive on their craftsmenship, whether they lacked technical quality, which was mostly suspected by the colleagues, or fortune in the profession, were nicknamed 'followers of art.' It was the time of voluptuous studio decorations, huge wooden frames around each portrait photograph, and money being made on quantity, not quality. But it was the time of science as well, and photography played an important role in many fields of human knowledge.

Photography became the most important instrument of description in positivistic approaches towards knowledge. Hermann Krone and Hermann Wilhelm Vogel within the 1860s established photography as a 'scientific aid' and accompanied dozens of excursions throughout the world for a large variety of reasons like solar eclipses in New Zealand and Egypt, and research for botanic and zoologic specimen in Asia and Africa. It may be seen as typically German that travel photography arose here not as business in the vicinity of literature and tourism but as a part of science and diplomacy. Wilhelm von Herford and Wilhelm Hammerschmidt travelled to the near East as diplomats whereas Fedor Jagor and Franz Stolze started their tours throughout the Middle East and Central Asia with an interest in anthropology and archaeology. From there it was only a small step for the scientists of the 1870s and 1880s to take up photography by themselves, as Heinrich Schliemann did when he excavated Troja. The ony exception to this rule may be described by the German expatriate Georg (later Giorgio) Sommer who fled his home town Frankfurt on Main after the bourgeois revolution in 1849 and became one of the most important travel photographers in Italy.

There is no science when it is not printed, and this fact stimulated a European-wide research for printing processes with results ready for use in the then rising publishing industry. Germany had four major contributions to make in this field throughout the 19th century, and all of these contribution came from Munich. In 1855, Edgar and his father Franz Hanfstaengl—then already well-known as photographers and lithographers—announced their charcoal printing process which they used in the business of art reproduction successfully for more than two decades. In 1868, the photographer Joseph Albert launched his 'Alberyype' process, a major development of the phototype process for producing large quantities of copies. His printing press sold images of Bavarian landscapes, the castles of King Ludwig II, and group portraits of all sorts of congregations with great economic success. The third contribution cannot be credited fully to a German inventor but to an Austrian as well: In 1883—at the same time as Karel Klietsch from Vienna, Georg Meisenbach published his autotype method of setting half-tone photographs through grids of glass, and in 1885, the first photographs were printed this way in a daily newspaper, the Illustrierte Zeitung from Leipzig. And in 1892, Hermann Wilhelm Vogel's son Ernst released the news that he and his companion William Kurtz had successfully installed a three-colour-printing process after photographs.

As the knowledge of Roger Fenton's participation in the Crimean war spread over Central Europe, photography became an integral part of early political propaganda in due course. In 1864, the war between Denmark and German troops under Prussian direction became an early symbol of the coming unification of all German states, and it might be for this reason that this rather unspectacular war with only one important battle received an enormous coverage by press and photographs. On the German side, the three photographers Christian Friedrich Brandt from Kiel—he produced large albums of medieval art afterwards, Heinrich Graf and Charles

Junod from Hamburg demonstrated their abilities by showing battlegrounds, artillery, and corpses but nearly no portrait of a general nor depictions of groups. As the photographs were commissioned by the army's leadership command, no one of the military officers seems to have understood the principles of effective propaganda as did their British colleagues.

Exactly the opposite practice was the result of Carl Friedrich Mylius' participation in the German-French war of 1870 and 1871. Mylius who had been specialised in architectural photography at his hometown of Frankfurt on Main before, concentrated on portraits of both the troops and the officers, and his business must have florished throughout the war. When the Prussian King Wilhelm was made Emperor of Germany in the castle of Versailles near Paris, the Berlin photographer Heinrich Schnaebeli was commissioned to produce an album of the military presence at this occasion—and his images are clearly to be viewed as photomontages. The invisibility of these important events had partially historical reasons—the crowning of the Prussian king in 1861 had been a quiet feast, the 1863 assembly of dukes and counts in Frankfurt on Main had failed in the unification of Germany, and Joseph Albert's photograph of this congress only showed a part of those invited—but there was a certain dislike in the medium due to old-fashioned ideas about art within the ruling class in Germany. Only at the very end of the 19th century, some members of the royal family began to spend an interest in photography which can be considered amateurish.

The military interest in photography grew with the technical developments: When Ottomar Anschuetz presented the first results of high-speed photographs with his patented focal-plane shutter to the General Staff in 1883, he immediately was made the official photographer of the Emperor's spring manœuvers, and the photographs of the 1884 manœuvers were the first ones to be printed in the autotype process in a German newspaper just a few days after the actual event. Anschuetz' close cooperation with the photographic industry bore many fruits, and the military use of the medium for technical purposes—like producing maps and area surveys—as well as for propagandistic use grew rapidly into the preparation of all kinds of applications of photography and cinematography as implemented in World War I. These developments coincided perfectly with the double use of another invention at least in larger parts stimulated by German scientists: photogrammetry. After seven years of investigation, the architect Albrecht Meydenbauer in 1865 presented a method of re-constructing buildings and sculptures by drawings in orthogonal projection made after stereo photographs under specific conditions. In 1885, the Berlin institute of photogrammetry (Messbildanstalt) was installed and became the most important source of architectural photographs of historical buildings for the next two decades. The military use of photogrammetry lifted considerably with balloon and aerial photography short before World War I.

In 1861, one of the most remarkable figures in German industrial history, Alfred Krupp, commissioned his far relative Hugo van Werden to learn photography in a studio in Hannover then well known for its qualities in depicting industrial products. After a short apprenticeship, van Werden set up the Krupp photographic and lithographic institute which from then on had to deliver all visual materials used for documentation, press releases, and public relation of Krupp's steel company. As early as in 1862 on the occasion of the London World Fair, Krupp was able to show and deliver larger quantities of photographs of all his products, and the company gained fame for the use of the new medium in advertising. Smaller companies of the fine-mechanical and optical industries immediately followed this example and created catalogues of their products by assembling series of photographs depicting each object as meticulously detailed as possible. But it must be admitted that the integration of photography into industrial advertisement and public relation was delayed in Germany if one compares the country with European or North American competitors on the world market, due to to two factors: a long period of economic recession throughout the 1870s and early 1880s, and above all, a comparatively low interest of German industrialists in the aesthetics of their products. This was only to change, with the help of photography, short after 1900.

On top of the Krupp stand at the World Fair in London in 1862 there was a large display of a panoramic photograph showing the Essen company site. Made of 12 images, it correlated to a recent fashion among manufacturers: showing a bird-like view of their establishment on top of all business papers. These were still etched in copper for the rest of the 19th century but each chief office had to have on the wall at least one panoramic view of the company's site. These photographs were either made by the company's own photographic department or by photographers specialized in landscape and architectural views. Parallel to the success of the travel photographers, a number of studios started to offer portfolios displayed specific types of architecture like villas, office buildings, town halls, and industrial sites. These portfolios were sold to architectural schools as well as to administrations in towns and countries, and some even caused interest among better-off citizens looking for the latest fashion in homes and gardens. Among the well known photographers working in this field one has to name Friedrich August Albert Schwartz, Hermann Rueckwardt, and Waldemar Titzenthaler from Berlin, Johannes Noehring from Luebeck, Julius Soehn from Duesseldorf, Anselm Schmitz and Johann Heinrich

Schoenscheidt from Cologne, Friedrich Georg and Hermann Friedrich Brandseph from Stuttgart, Carl Teufel and the company of Jaeger & Goergen from Munich, Bernhard Johannes from Partenkirchen. One should not under-estimate the visual training given to the public by these photographs which were as influential as the average portrait photography of the same days.

The last and—from an aesthetic view—most exciting chapter of German photography in the 19th century was opened with an exhibition in Berlin dedicated to the half-centennial of the medium's history. Installed by the Photographische Verein zu Berlin under the direction of Hermann Wilhelm Vogel, this exhibition comprised not only the newest developments of photographic science and the use of photography within science and practice; it did not only show the early pride of the rising photographic industry in Germany by displaying cameras, lenses, and all kinds of apparatus; this exhibition had a special department devoted to photographic art—and it saw the future of imagery in the works of amateurs like the young Berlin student Alfred Stieglitz. He was the actual star of both the exhibition and its juries, in all parts of the show he either received gold and silver medals or was an important member of the panel. Whether he crowned a lens for portraiture or honoured a print-out paper, Stieglitz was an integral part of the photographic establishment mentored by his teacher Vogel and other celebrities of German photography.

Stieglitz' astonishing success was accompanied by the distinction for several amateur photographers from all over Europe and defines the actual birth of a fine art Photography movement in Germany. When the art historian Alfred Lichtwark became director of the Kunsthalle in Hamburg in 1886 he delivered a number of speeches emphasizing the importance of amateurs' activities in the arts. Subsequently he supported the foundation of the first Hamburg society for the amelioration of photography which became the nucleus of the German Fine Art Movement in photography. Similar societies existed already in Berlin and Dresden, numerous others were founded within the 1890s, and at the turn of the century Germany had a lively scene of fine art photographers who were dedicated amateurs.

The social distinction of these amateur circles is obvious: There were well-to-do merchants like Heinrich Wilhelm Mueller, Georg Einbeck, and Gustav E.B. Trinks, physicians like Eduard Arning and Konrad Biesalski, military officers like A. Boehmer, Ludwig David, and Walter Heinrich von Ohlendorff, civil servants like the brothers Theodor and Oskar Hofmeister and Anton Christian Bruhn, school teachers like Otto Scharf, Rudolf Crell, and Heinrich Linde, and the women involved often enough had an aristocratic background, e.g. like Alma Lessing, Harriet Helene von Bronsat, or Anna von Krane. The collectors of these early fine art photographs either shared the interests of their friends or were busy with acknowledging photography as a true medium of art—among them one has to name Ernst Juhl and Fritz Matthies-Masuren who were not only private collectors of interest and quality but instigated several graphic departments of established museums to build up photographic collections of their own. These collections in Hamburg, Berlin, and Dresden today still rank among the finest in Germany.

Above all other implications, the fine art movement instigated a substantial rise of quality within professional photography. Be it the careers of Rudolph Duehrkoop from Hamburg, of Nicola Perscheid from Berlin, of Hugo Erfurth and Erwin Raupp from Dresden, of Albert Gottheil from Danzig, of the brothers Jacob and Theodor Hilsdorf from Bingen and Munich, and of Wilhelm Weimer from Darmstadt—neither of these were possible without their early acknowledgement of what happened in the fine art circles and their exhibitions. The life history of Hugo Erfurth may be seen as exemplary for most of his competitors: He participated in three major amateur photography exhibitions—including the famous 1893 show of the Hamburgian friends of photography—before he enrolled as an apprentice with the Dresden photographer Wilhelm Hoeffert. Only one year later he already owned his first studio, and within the last five years of the 19th century, Erfurth managed to become one of the five most celebrated photographers in Germany.

The 'professional fine art photographers' balanced economic success and aesthetic interest by combining all important developments of their century. The subjects were chosen in accordance to classical genres: portraiture, nude, landscape—with a general exclusion of heroic scenes and an equally general inclusion of symbolic settings. The method of making allotted to a personal style—chosing gum printing in one, two or more specific colours or sticking to carbon or platinum printing, furnishing reception from the public by brushing the negative or painting on the positive. All of these manipulations formed a stylistic approach that had secured the amateurs of fine art photography in their creative autonomy but worked out as a valuable set of distinctions between professional competitors. At the end of the 19th century, photography in Germany finally was a renowned practice of design if not fine art—modernism, already visible in other forms of art, just had to come.

ROLF SACHSSE

See also: von Steinheil, Karl August and Hugo Adolf; von Kobell, Franz; von Humboldt, Alexander**;** Talbot, William Henry Fox; Hill, David Octavius, and Robert Adamson; Schneider, Trutpert, Wilhelm, and Heinrich; Busch, Friedrich Emil; Carte-de-

Visite; Cabinet Cards; Fenton, Roger; Architecture; Portraiture; Landscape; Industrial Photography

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GERNSHEIM, ALISON (1911–1969) AND HELMUT ERICH ROBERT (1913–1995)

Helmut Gernsheim was born in Munich, Germany, on March 1, 1913, of mixed background, his mother coming from Catholic stock and his father being a Protestant convert with a long Jewish heritage in the Bavarian city of Worms. His family was comfortably middle-class, his father being a literary historian employed by the Munich University Library, and growing up in the progressive European city of Munich afforded the youth both an excellent education and a strong cultural upbringing. Fascinated by materiality he became an inveterate collector of objects and upon graduation in 1933 resolved to study art history like his eldest brother, Walter—first under the art historian, William Pinder, and then at the Bavarian State School of Photography.

He graduated *summa cum laude* in 1937, worked as a practical photographer for a year, and then fled the rising tide of Nazism in Germany. He moved to London in July of that year, first working for Walter who owned an art gallery there, and then establishing himself as a commercial photographer. Nonetheless, the critical and scholarly aspects of photography were never far from his mind and—rejecting such schools as pictorialism, photojournalism and experimental abstract art—he became an early advocate for the principles of the German photographer Albert Renger-Patzsch and his *Neue Sachlichkeit* school of modern art, while actively participating in the British photographic societies and exhibitions of the era.

Alison Eames was born in London on February 10, 1911, receiving a middle class education at Brikbeck College and a finishing school in Paris. Back in London and while pursuing a clerical career, she married an accountant, Blen Williams. The couple met Helmut at a London nudist park in 1938 where all were members. Within a year Alison separated from her husband and began her relationship with Helmut. Like so many others at the time, their lives were dramatically interrupted by World War II.

Helmut was interned in Australia as a "friendly enemy alien" in July of 1940 and, following a long bureaucratic struggle, finally made it back to embattled London in November of 1941. There he and Alison were able to establish a home in 1942 after she won an amicable divorce from her husband, maintaining a *de facto* marriage until they could legally wed after the war. While enduring the bombing of London, Alison pursued her secretarial career and Helmut won a coveted position with the Warburg Institute as the chief photographer for the London area, documenting British buildings and statuary for the National Buildings Record from 1942 to 1945. While engaged in making a permanent photographic record of the art and architecture endangered by the war, Helmut also produced a major body of work which sought to "instill life and action in the stone."

He also became a published author in 1942 with his *New Photo Vision*, a small but important critical treatise which condemned the staid practices of pictorialism, advocated the principles of modern European photography, pointed out the vibrant historical roots of the medium, and argued for the active role of the photographer in making the world see things anew. The book would provide him with the initial fame and advocacy he craved and marked his emergence as a dynamic and critical voice for the new art.

At the end of 1944 the Gernsheims were visited in London by Beaumont Newhall, the dean of American photohistorians. They discovered a kindred spirit and Newhall for his part encouraged them to begin collecting historical British photography as the war was winding down and a new era was beginning. The suggestion ignited Helmut's old collecting urges and on January 6, 1945, he headed off into the antique shops and fairs of London to begin building a collection. The man and the timing proved to be more than correct and Helmut quickly amassed some important and discriminating pieces of art and apparatus from the nineteenth and early twentieth centuries. Supported by Alison's encouragement, scholarship and writing talents, they began to build an important body of art and artifacts in their London flat.

In 1947 they elected to make the brave decision to abandon their careers—his as a photographer and hers as secretary to a Member of Parliament—and devote themselves full-time to the building and marketing of the already famous Gernsheim Collection and the support activities of writing, editing, lecturing and the creation of exhibitions. They would do so actively, carefully and passionately for a total of eighteen years, until 1963. In the course of their efforts they discovered and acquired whole bodies of art by such important figures

as D.O. Hill, Robert Adamson, Julia Margaret Cameron, Roger Fenton, Lewis Carroll, Henry Peach Robinson, Peter Henry Emerson, Paul Martin and Alvin Langdon Coburn—not to mention the rediscovery of Joseph Nicéphore Niépce's first photograph in 1952.

Their labors and careers did not just begin and end with the process of acquisitions. The Gernsheims backed up their collection-building with scrupulous and massive original research, careful scholarship, public lectures and teaching, and a variety of advocacy and enterprises that eventually became international in scope. Not content to merely discover works and artists and to add them to their holdings, they also began to actively publish their findings. In the course of their eighteen years of productivity they authored more than 200 articles and nearly two dozen books from their collection. The publications ranged from picture books of Helmut's photographs to important scholarly monographs on such individuals as Carroll, Cameron and Fenton. In order to help their own finances and make the collection self-sustaining they also authored and edited general picture books on such figures as Queen Victoria, King Edward & Queen Alexandra, and Winston Churchill, as well as providing illustrations from their collection for a large number of magazine and book publishers of the time. Their classic *History of Photography,* first published in 1955, grew out of their passion for historical British photography but became more massive and international in scope with each newer edition and in tandem with the expanding parameters of their own collection's growth.

Besides utilizing publications, they also based their advocacy for expanding the word about photography's significance as a major art form through a variety of traveling exhibitions. Beginning with their newsmaking exhibition, *Masterpieces of Victorian Photography*, at the Festival of Britain in 1951, they learned the value of bringing the original art to the public. This was followed in 1952 with their expanded show, *A Century of Photography*, held at the World Exhibition of Photography in Lucerne, which also first revealed the international and modernist expansions that the Gernsheim Collection had begun to undertake. Between 1956 and 1961 the collection would be featured in eight massive European venues (each with its own catalogue as well) that served to spread the word about the artistic and cultural heritage of photography and its history.

Throughout the 1950s and early 1960s the Gernsheims also struggled to find an institutional home for themselves and their collection. Building up the collection while making a living through publications, print sales and exhibitions was an exhaustive process, and the couple tried in vain to find an organization or museum that would help them share the burden while also allowing them the independence to continue adding to their world-renowned holdings. At least three dozen groups—ranging from UNESCO to the cities of Cologne and Gothenburg—were approached and abandoned. In 1963 a private investment scheme brought the Gernsheims and their collection to Detroit, Michigan, USA, but the plan fell apart. In the summer of 1963 the Gernsheims accepted an offer from The University of Texas at Austin and sold the collection, together with their research library, correspondence, research files and archives, for $300,000. (They also sold a much smaller selection of all their duplicate prints to the Moderna Museet in Stockholm.) Rather than accompanying the archive, however, they elected to receive the funds over a period of six years and retired to Lugano,Switzerland, in 1965.

In "retirement" the Gernsheims continued to update and edit their publications and travel the world. Alison was injured in a fall on a South American trip in 1969 and died as a result of surgical complications afterwards. Helmut remarried in 1970 and began to take a renewed interest once more in photohistorical advocacy, education and scholarship. In the remaining twenty-five years of his life he began building another collection—this time of contemporary photography with an international range—as well as writing more books and starting to rewrite and enlarge his massive *History* once more. He maintained a large volume of correspondence and, throughout the 1970s and 1980s taught at a number of universities and workshops in Switzerland, Britain, France and most especially the United States. In 1984 he arranged a traveling retrospective exhibition of his own photography—his first in nearly 40 years—so that a new generation could rediscover his own artistry. Finally, in 1995 after completing an exhibition from his new collection, he died of a heart attack in Lugano.

His widow sold his new library, collection of contemporary photographs and remaining papers to the Reiss-Engelhorn Museum in Mannheim, Germany. Between this final deposit and the two existing collections in Austin, Texas, and Stockholm, Sweden, the Gernsheims remain the only photohistorians who are represented by having collections/archives in three major institutions around the world.

ROY FLUKINGER

Biography

Helmut Gernsheim was born in Munich, Germany, on March 1, 1913. An inveterate collector in his youth, he studied art history and graduated from the Bavarian State School of Photography in 1937. He fled Nazism that year and immigrated to London, England where he became a commercial photographer. He met Alison Eames, a native Londoner, who was born on February 10, 1911 and, following a middle-class British upbringing, was pursuing a clerical career. Separated by Helmut's alien

internship in Australia at the start of World War II, the Gernsheims were reunited in London in 1942 where Helmut went to work for the Warburg Institute until 1945. A meeting and continuing friendship with Beaumont Newhall led to their beginning to collect original photographic art and apparatus in that year. By 1947 their Gernsheim Collection was growing to such an extent that they abandoned their previous careers and became full-time collectors, historians, researchers, advocates, lecturers, teachers and authors. In the course of 18 years, from 1945 to 1963, they built one of the greatest photohistorical collections in history, specializing in nineteenth century British photography. During this extremely creative interval they also authored some 200 scholarly and popular articles and nearly two dozen books on the subject, as well as instituting a series of major international traveling exhibitions from the collection. In 1963 they sold their collection and archive to The University of Texas at Austin and retired to Lugano, Switzerland. They continued to write, edit and travel until Alison's death on March 27, 1969. Remarrying in the following year, Helmut continued to research, write, teach and lecture for another quarter century. He also began collecting contemporary photographs up until the time of his death on July 20, 1995. His later collection and archive are now housed at the Reiss-Engelhorn Museum in Mannheim, Germany.

See also: Hill, David Octavius, and Robert Adamson; Cameron, Julia Margaret; Fenton, Roger; Robinson, Henry Peach; Emerson, Peter Henry; Martin, Paul Augustus; Dodgson, Charles Lutwidge (Carroll, Lewis); Coburn, Alvin Langdon; Niépce, Joseph Nicéphore; and Victoria, Queen and Prince Albert Consort.

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GHÉMAR, LOUIS (1819–1873)

Belgian photographer, lithographer, and painter

Louis Joseph Ghémar was born in Lannoy, northern France, on 8 January 1819, the first child of aspirational parents of modest means. His father, Ange Ghémar, was an *instituteur* [primary school teacher] and his mother, Catherine Horlait, the daughter of a brewer of Belgian origin. After the death of her husband in 1830, Catherine moved back to Belgium and remarried Toussaint Ouverleaux, *professeur* [high school teacher] and future principal of the Collège royal d'Ath. Ghémar studied there and had lessons at the art academy in Ath.

Ghémar moved to Brussels aged 17 in order to train and earn his living as a draughtsman. He became a pupil of the painter Paul Lauters (1806–1875). Ghémar initially came to prominence as a caricaturist, his portraits appearing in the Belgian edition of the French satirical magazine *Charivari* from April 1839 onwards. In the 1840s, Ghémar gained a reputation as a prolific lithographer, supplying views in the Romantic tradition for

series such as the *Album pittoresque de Bruges* (1840) and *La Belgique monumentale, historique et pittoresque* (1844), as well as undertaking copy work, notably the *Album du Salon de 1845*.

Ghémar moved to Edinburgh in 1849 to form a partnership with the lithographer Frederick (Friedrich) Schenck. The partners, operating from their establishment at 9 Greenside Place, communicated an innovation to the Royal Scottish Society of Arts in August 1849, enabling lithographs to be "drawn, lithographed, and cast off in three hours." They published *Portraits of the Leading Reformers* in the new process.

When exactly Ghémar came to photography is unrecorded, but his career move parallels that of another caricaturist and lithographer, Ghémar's lifelong friend Nadar. For both men, photography, making inroads into the classic graphic processes, would principally be used for portraiture. Ghémar did not practice commercially in Edinburgh, but he may well have learned photography there, since, very soon after his return to Belgium in August 1854, he advertised himself as a photographer. He opened a studio in Antwerp, at Rue Houblonnière 1474, in partnership with Robert Severin (1839–after 1883), son of Ghémar's friend, the leading Düsseldorf photographer and lithographer Wilhelm Severin (1809–1888). A visiting journalist described the studio as "…un atelier modeste de dimensions, mais littéralement encombré d'œuvres très distinguées et de portraits exquis" [a studio of modest dimensions, but literally crammed full of very fine works and exquisite portraits] (*Le Précurseur*, 23 February 1855). Ghémar and Severin organised a well received exhibition at the Cercle artistique et littéraire in August 1855, where they showed the full range of their output, townscapes and reproductions of artworks as well as portraiture.

Ghémar used his foothold on the Belgian market to secure his new reputation as a photographic portraitist and to prepare his return to the capital. The partners sold the Antwerp studio to Auguste De Bedts in February 1856 and moved into premises in Brussels at rue de l'Ecuyer 27. Using Ghémar's contacts in artistic circles and high society, Ghémar and Severin's studio enjoyed immediate success. On the occasion of Leopold I's silver jubilee in 1856, the king sat for them. One of the resulting portraits, showing the king in general's uniform, was published as a lithograph by Simonau and Toovey and became the most popular graphic representation of the Belgian monarch. The portrait also featured prominently in the partnership's submission to the photography exhibition held in Brussels in August 1856, where Ernest Lacan noted Ghémar's characteristic techniques of retouching in pastel and overpainting and concluded: "En s'associant, MM. Ghémar et Severin ne pouvaient produire que des œuvres de mérite. En effet, l'un est peintre de talent, l'autre photographe habile." [By forming a partnership, Messrs Ghémar and Severin could not but produce works of merit. One is a painter of talent, the other a skilled photographer.] (Lacan, Ernest, "Exposition photographique de Bruxelles," *La Lumière*, 27 September 1856: 149)

By 1860, the partnership had been dissolved and Severin moved to The Hague. Ghémar initially ran the studio alone, then formed a partnership with his younger half-brother Léon Louis Auverleaux (1832–1869) under the denomination *Ghémar frères*. The new partnership coincided with the introduction of the carte-de-visite, and the studio would prosper riding the wave of popularity enjoyed by this format in the early to mid 1860s. Ghémar continued to receive royal patronage and in 1864 published a set of 37 portraits of the Belgian royal family. He created another significant series when the took the portraits of all eighty guests at the dinner held in honour of the exiled Victor Hugo by his publishers Lacroix, Verboeckhoven in Brussels on 16 September 1862. This event, which has gone down in history as the "*banquet des Misérables*," shows the raffish and witty Ghémar's talents at their best, as he passes each one of the literary and artistic devotees and friends of the French novelist in front of his lens, not as a hired hand, but as an equal.

In June 1863 Auverleaux set up his own studio in Brussels, but Louis Ghémar retained the company name of *Ghémar frères*, instantly recognisable to the public at large. Ghémar formed a liaison with the younger Marie Catherine Jadoul (1844–1882) who bore him four children between 1864 and 1871; they married on 15 July 1871. During his career as a photographer, Ghémar maintained some output as an artist, and also traded in paintings and objets d'art, at the *Galerie Ghémar*, at Rue du Persil 4, open by 1865, and where he was also domiciled from 12 December 1868. A highpoint of sorts was constituted by his exhibition, the *Musée Ghémar*, a satirical but affectionate side-swipe at the art world held in 1870, and made up of 100 pastiches in oils of contemporary artists, all painted by Ghémar himself.

Ghémar exhibited infrequently and only at prestigious venues, at the universal exhibitions in London in 1862 and Paris in 1867. The reputation of his studio was secure in any case. An atypical commission for urban views of Brussels constituted his final important series. The Belgian Public Works Company, charged with redeveloping the centre of Brussels and bricking over the pestilential river Senne, entrusted Ghémar with recording the picturesque corners of the capital doomed to demolition. Ghémar produced a series of twelve full-plate views entitled *Assainissement de la Senne. Bruxelles en 1867. Vues photographiques prises à l'emplacement du nouveau boulevard…* [Sanitising the Senne. Brussels in 1867. Photographic views taken on the site of the new boulevard…].

Louis Ghémar died in Brussels on 11 May 1873 and is buried in Laeken cemetery, in a mausoleum designed by the French sculptor Ernest Carrier-Belleuse (1824–1873). The inscription refers to Ghémar as an "*artiste dessinateur*" [artist draughtsman] rather than photographer. The studio continued trading as *Ghémar frères*, much reduced in reputation and quality, until 1894, when its negatives were acquired by the neighbouring firm of *Géruzet frères*.

There are substantial holdings of Ghémar's work at the Archives de la Ville de Bruxelles, Archives du Palais du Roi, Brussels, Bibliothèque royale Albert Ier—Cabinet des estampes, Brussels, Provinciaal Museum voor Fotografie, Antwerp, and Musée de la photographie, Charleroi. The recently restored mausoleum is accessible to the public.

STEVEN F. JOSEPH

Biography

Louis Joseph Ghémar was born in Lannoy, northern France, on 8 January 1819, the first child of aspirational parents. Ghémar moved to Brussels aged 17 in order to train as a draughtsman. He initially came to prominence as a caricaturist. Ghémar worked in Edinburgh from 1849 as a lithographer. On his return to Belgium in 1854, he opened a studio in Antwerp in partnership with Robert Severin. The partners sold the studio in 1856 and moved to Brussels. Using Ghémar's contacts in artistic circles and high society, Ghémar and Severin's studio enjoyed immediate success. Following dissolution of this partnership by 1860, Ghémar formed a partnership with his younger half-brother under the denomination "Ghémar frères." During his career as a photographer, Ghémar maintained some output as an artist, and also traded in paintings and objets d'art. Ghémar formed a liaison with the younger Marie Catherine Jadoul (1844–1882) who bore him four children between 1864 and 1871; they married on 15 July 1871. Ghémar died on 11 May 1873 and is buried in Laeken cemetery.

See also: Nadar; Portraiture; and Lithography.

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GIROUX, ANDRÉ (1801–1879)

André Giroux was born in Paris on April 30, 1801. Coming from a middle-class family familiar with the artistic medium, he was directed early on towards a career as a painter. Studying initially with his father, he entered the workshop of the neo-classic landscape designer Thibault. He exhibited his first paintings at the Salon of 1819, then integrated two years later in 1821 into the prestigious School of Art, Paris. Consequently, for him the prospect opened for a traditional career devoted to painting, which was crowned by the award of du Grand Prix de Rome de Paysage historique in 1825. During his stay in Rome, André Giroux met Camille Corot, Leon Fleury, Edouard Bertin and even Theodore Caruelle d'Aligny with whom he established a long friendship. The emulation produced by these meetings strongly influenced his practice and his renderings of Italy undoubtedly count among his most accomplished pictures. On his return to Paris in 1830, Giroux continued his painting career and continued to exhibit, every quarter, at the Salon until 1846.

The first traces of his photographic activity go back to the early 1850s. Well-informed of his career as a painter, we are missing documentation of the important years that were devoted to photography. His father Alphonse Giroux celebrated commercial art and had a shop with his wife Zoé Colin on the 7 rue du Coq Saint-Honoré in Paris, which had been open since 1799. In this shop, which was to become famous, they sold objects of curiosities, marquetry, and paper but also drawings, pictures, and engravings. In 1834, on the first floor of the shop of his parents, André Giroux undertook with his elder brother, Alphonse-Gustave, the marketing of objects of curiosities and imagination. Four years later, on May 19, 1938, the two brothers repurchased with their parents the assets of Giroux et Cie of which they became sole owner. Alphonse-Gustave headed the commercial endeavors, while André simply played the part of silent partner. The following year, in the weeks

that followed the advertisement of the discovery of photography, Jacques Louis Mandé Daguerre, the inventor, signed on June 22, 1839 a franchise agreement with company, "Giroux and Co" for the construction and marketing of his photographic systems, including cameras, plates, chemicals and ancillary equipment. At the same time, André and Alphonse Giroux published on August 20 the first descriptive instructions of the daguerreotype process.

This agreement created great interest in photography for André Giroux; however nothing indicated that he tried out the technique of the daguerreotype, and if he did, none of those attempts have survived. It is not certain if André Giroux's artistic reflections found in the use of this new technique were prolonged and developed throughout his career. He waited more than ten years for the introduction of the negative-positive process on paper in France, when his taste for photography became apparent.

Compared with the production of his contemporaries who, like him, practised photography as "amateurs"—such as Olympe Aguado, Louis Robert, or Humbert de Molard—the photographic oeuvre of André Giroux can be regarded as modest. Hardly more than sixty prints have been found, spread throughout many public and private collections. This choice of paper negatives and salted paper prints determined the character of André Giroux's photographs. This choice of negative paper and the use of the positive prints on salted paper determined the esthetics of the photographs of André Giroux. During the four years of his activity—one can indeed reasonably think that he ceased his production around 1857—he used alternatively two formats of negative (22 × 28 cm and 28 × 38 cm).

With two exceptions, André Giroux took landscape and architectural pictures exclusively. Landscapes of edges of rivers, interiors of courts, views of agrarian buildings or ancient monuments constitute the main portion of his images. In contrast to the photographers who drew their inspiration from the forests in the neighborhoods of Paris, in particular that of Fontainebleau, André Giroux showed a clear predilection for more remote places. One can, however, only partially reconstitute his various voyages taken in various areas of France. In the same way their chronology remains speculative. Thanks to the titles of the works provided by the catalogues of expositions in which he took part, as well as with the indications reproduced on some of his photographs, one is able to establish that André Giroux returned to areas of Arles like the valley of the Rhone. But it is in Auvergne that he carried out, it seems, a majority portion of his captured images.

André Giroux had already experienced the tradition of the Grand Tour during his years training as a painter in Italy and later, while working in certain areas of France and Europe. He followed in the vogue of the landscape naturalist introduced in France at the beginning of the century by the theories of Pierre-Henri Valencian and relayed in 1817 by the publication *Les nouveaux voyages pittoresques en France*. There is consequently nothing astonishing to find in the photographic work of Andre Giroux in this evocation of the picturesque landscape that one frequently finds in his paintings. Some of his photographs, like *Hangar au bout du chemin*, testify to this art of the setting in scenes of the picturesque and whose audacity of composition, in particular the marked presence of the foreground, announces the style characteristic of the photographic work of Andre Giroux.

In what is known of this work, the images of Auvergne are first rate, by their number as well as by their formal diversity. The geographical situation of the regions that he crossed—Lozere, Aveyron, and to combine them at the border of Auvergne—offered to him varieties of semi-mountainous landscapes with many villages crossed by rivers. The edges of the gorges of Jonte, between Peyreleau and Meyrueis, at the border of Aveyron and Lozere, particularly seem to have held his attention. The damaged character of the landscape gave him the opportunity to emphasize the picturesque aspects of the places that he photographe: a path bordered with houses with thatched roofs, a stone bridge spanning water, a hut on the wooded and precipitous slopes of the mountains, a line of houses on side of river. The quasi-systematic reference to the painting that one can read in criticisms from the time concerning the photographic oeuvre of Andre Giroux does not show anything surprising. One finds indeed marked stylistic similarities between some of his paintings and some of his photographs.

If these landscapes were largely admired, some not hesitating to compare them with those of Gustave le Gray, no criticisms, however, failed to stress the importance of the final improvement in the photographic work of Andre Giroux. This artifice so violently attacked by Eugene Durieu, president of the Société française de photographie in 1855, for which "... to invite the brush with the help of photography under pretext of introducing art there, it is precisely to exclude the photographic art" (*Bulletin of the Société française de photographie*, 1855, t.1, p. 301). In spite of criticisms and like majority of the photographers of his time, André Giroux frequently improved his negatives. A detailed examination of each one of his prints indeed makes it possible to detect the subtle interventions to which it proceeded in a systematic way, thus giving to each one of these prints a particular character. This technique then enabled him to approach the effects that he could obtain in his paintings while creating artificially, by the means of the gouache and the scraping directly applied to negative, an effect of cloud as in *Obtevoz, Rhône* (J.Paul Getty Museum), or the transparency of water in his many photos of edges

of rivers, *Cascade dans le Massif central* (Philadelphia Museum of Art). If in some of this photography, as in *Rivière avec effet de lune* (Musee d'Orsay), the artifice seems to have been pushed to its extreme, conferring on these images the characteristic forerunners of the impressionist current, they do not remain less learnedly composed. In the same way, one finds in the images of architecture of the area of Arles, this consumed art of the final improvement giving to the vestiges a romantic atmosphere, contrary to the topographic sights of the same place of an Edouard Baldus or a Domenica Roman. This taste of the effect and formal research so present in André Giroux gives to the whole of hhis sound oeuvre a singularity not found elsewhere.

Undoubtedly, André Giroux was a painter much more than photographer, even if his technical ability in this field did not have anything to rival that of his famous contemporaries. To take again the beautiful expression the photographer Edouard Baldus used to define him, one could qualify André Giroux as *peintre photographe*. But contrary to many photographers such as Edouard Baldus, Gustave le Gray, Henri le Secq, Charles Nègre or Roger Fenton, all former painters who gave up painting for the profit of photography, André Giroux was the only one not to disavow his artistic origin. Concerned with his independence, he never hoped to be among the members of prestigious Société française de photographie, however important it was to the supporters of photographic art. In the custom of the annual Salon des beaux arts, he exhibited some of his photographs however with the exposition organized by French Société of photography in 1857 and 1870, like in Brussels in 1857, thus showing his will to subject his work to criticism. His last exposition was held with the Salon of 1874, during which three of his paintings were presented. He died a few years later in Paris, in 1879.

DENIS CANGUILHEM

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GLAISHER, JAMES (1809–1903)

Victorian meteorologist and aerial physicist

James Glaisher was born on April 7th, 1809, at Rotherhithe, England, and christened at St Mary's, Rotherhithe, on April 30th. By 1816 his father, also named James, and mother, Mary (believed born Middleton), moved to Greenwich. It is not known to what extent Glaisher received a formal education. He was introduced to the work of the Royal Observatory, Greenwich, by William Richardson, a family friend, and assistant observer there.

Appointed as an assistant to the Ordnance Survey of Ireland, Glaisher made meteorological measurements and observations in 1830–1831 on Bencorr Mountain in Galway, and at the summit of Keeper Mountain (now Hill) in Tipperary. His obituary in *The Aeronautical Journal* of April 1903 quotes him as saying, "In the performance of my duty I was often compelled to remain sometimes for long periods above or enveloped in cloud. I was thus led to study the colors of the sky, the delicate tints of the clouds, the motion of opaque masses, the forms of the crystals of snow." His interest in atmospheric phenomena may be traced from this time.

Between 1833 and 1836 Glaisher worked as an astronomical assistant at the Cambridge Observatory in England, under the direction of George Biddell Airy (1801–1892), Professor of Astronomy at Cambridge University. In February 1836 he moved to the Royal Observatory, Greenwich, where in 1835 Airy had become the 7th Astronomer Royal.

At Airy's suggestion a separate Magnetic Observatory was built in 1838, and in 1840 Glaisher became Superintendent of the Meteorological and Magnetic Department, where recordings of variations in the direction and intensity of the Earth's magnetism were measured in order to improve compass navigation, and readings from thermometers, barometers, and other meteorological instruments were taken every two hours, day and night. In 1848 a system of photographic self-registration for the instruments, devised by Charles Brooke FRS (1804–1879), was introduced. Glaisher described these activities in "The Application of Photography to investigations in Terrestrial Magnetism and Meteorology as practiced at the Royal Observatory, Greenwich" (Glaisher, 1859).

On December 31st, 1843, James Glaisher married

Cecilia Louisa Belville (1828–1892). Her father, John Henry Belville (1795–1856), was an assistant observer at Greenwich, and author of *A Manual Of The Barometer* (London: R. & J.E. Taylor, 1849) and *A Manual Of The Thermometer* (London: R. & J.E. Taylor, 1850).

Glaisher's career is representative of the transition in science in mid-nineteenth century Britain, when the study of natural phenomena became a regulated and professionalized field. He helped to establish and organize a network of people around the country, and promoted the use of accurate, standardized instruments to record the meteorological observations they supplied him with. He correlated the data into reports, which were published in *The Times* by the Registrar-General.

He was elected a Fellow of the Royal Astronomical Society in 1841, and a Fellow of the Royal Society in 1849. From the early 1850s his rise in the scientific community began. On April 3rd, 1850, he helped to found the British Meteorological Society at Hartwell House in Buckinghamshire, the home of Dr John Lee (1783–1866).

Glaisher wrote the report for the jury of "Class 10," the category in which photography was placed at the 1851 Great Exhibition. On February 4th, 1852, he gave a lecture on "Philosophical Instruments and Processes, as represented in the Great Exhibition," one of the series of lectures given at the Society of Arts, reviewing the Great Exhibition. Between December 22nd, 1852, and the end of January 1853, a large exhibition of photographs was held there to coincide with the formation of the Photographic Society on January 20th, 1853 (see Taylor, 2002, 16–20). On January 26th, 1853, Glaisher read a paper, "On the Chief Points of Excellence in the different Processes of Photography, as illustrated by the present Exhibition." The Photographic Society held its first Ordinary Meeting at the Society of Arts on February 3rd, 1853. Glaisher was elected on March 2nd, 1854.

There are references in contemporary journals to James Glaisher having made photographs of architectural and landscape views. Whilst it appears uncertain whether any of these may survive, work that does remain from this period are photogenic drawings of ferns made by Cecilia Louisa Glaisher between approximately 1854 and 1856. A project in collaboration with the fern expert and publisher Edward Newman (1801–1876), *The British Ferns—Photographed from Nature by Mrs Glaisher* was planned to be issued in a series. Newman presented a portfolio of ten positive salt paper prints to the Linnean Society in London, along with a flyer in which he explained the intention of the work. Twelve prints were shown at the photography exhibition held in conjunction with the British Association for the Advancement of Science's meeting in Glasgow in September 1855. Although the project appears to have been abandoned, two albumen prints of ferns were entered by James Glaisher in the 1885 International Inventions Exhibition held in South Kensington, as examples of "Nature-printing, taken over 30 years ago" (*The Photographic Journal*, 9:9 1885, 168). Prints from this exhibition became part of the historical collection of the Photographic Society, now at the National Museum of Photography Film and Television in Bradford.

Glaisher helped to found and was President of the Blackheath Photographic Society in 1857. He oversaw the chemical side of the production by A.J. Melhuish (1829–1895) of albumen prints for Charles Piazzi Smyth's *Teneriffe: An Astronomer's experiment*: *or, Specialities of a Residence Above the Clouds*, which was illustrated with tipped-in photo-stereographs, and published by Lovell Reeve in 1858. A member and referee of the Amateur Photographic Association, Glaisher sorted and examined the photographs submitted to the Association by its members, producing detailed annual reports on the numbers, sizes, and merits of the processes and pictures.

In 1862, on behalf of the British Association for the Advancement of Science, he began a series of experiments during high-altitude balloon ascents with the aeronaut Henry Coxwell (1819–1900). The experiments included measuring how temperature varied with altitude, examining the humidity and electrical condition of the atmosphere at different heights, recording the sun's spectrum and taking measurements of the intensity of light.

He appears to have twice attempted to photograph during balloon ascents. Describing one ascent from Wolverhampton on September 5th, 1862, he wrote: "On emerging from the cloud at 1 hr. 17m. we came into a flood of light, with a beautiful blue sky without a cloud above us, and a magnificent sea of cloud below, its surface being varied with endless hills, hillocks, mountain chains, and many snow-white masses rising from it. I here tried to take a view with the camera, but we were rising too rapidly and revolving too rapidly for me to do so; the flood of light, however, was so great, that all I should have needed would have been a momentary exposure, as Dr Hill Norris had kindly furnished me with extremely sensitive dry plates for the purpose" (*The Photographic News,* 6:210, 444, 1862). On the second occasion, his eleventh ascent, made from Wolverton in June 1863, he attempted to photograph with a camera provided by Melhuish, but was unable to do so due to strange weather conditions (see *The Times*, July 2, 1863).

Glaisher was elected President of the Photographic Society in 1869, following Sir Frederick Pollock. It's longest serving President, he held office until 1892, except for an interval in 1874–5 when he resigned and the Presidency was offered to William Henry Fox

Talbot (see *The Correspondence of William Henry Fox Talbot*, document number 03448), an offer Talbot declined. When Glaisher stood down in 1892, William de Wiveleslie Abney FRS was elected. (For comments on Glaisher's presidency, see Gernsheim, 1955, 256, and Harker, 1979, 64).

Having left the Meteorological and Magnetic Observatory at Greenwich in 1874, aged 65, Glaisher continued to be involved with, write reports for, and give lectures at many learned societies and other institutions. He was on the Executive Committee of the Palestine Exploration Fund, its Chairman in 1880–1900, and wrote reports on the meteorology of Jerusalem which were published in the Fund's *Quarterly Statement*. He was a member of the Council of the Aeronautical Society from its foundation in 1866 until his death, which occurred on February 7th, 1903, two months before his 94th birthday. His funeral took place on February 11th at St John's Parish Church in Shirley, Croydon. A report in *The Times* the following day described the arrangements as having been of the simplest nature.

CAROLINE MARTEN

Biography

James Glaisher (1809–1903), Superintendent of the Meteorological and Magnetic Department at the Royal Observatory, Greenwich, studied meteorology and atmospheric phenomena by ground-based observations and in a series of scientific experiments during high-altitude balloon ascents in the 1860s. A member of the British Association for the Advancement of Science, Glaisher was elected a fellow of the Royal Astronomical Society in 1841, and a fellow of the Royal Society in 1849. He helped to initiate the founding of the British Meteorological Society in 1850, serving as a Secretary until 1873, and President in 1867-68. He worked to organize meteorology into an exact science, promoting the use of accurate, standardized instruments. He was a fellow of the Microscopical Society, and its President in 1865–8. Elected a member of the Photographic Society in 1854, he was President from 1869–1874 and 1875–1892, interested mainly in the practical, technical, and scientific applications of photography. In 1843 he married Cecilia Louisa Belville (1828–1892), who collaborated with him on a paper about the formation of snow crystals. A snow crystal drawn by Cecilia Louisa Glaisher forms the basis of the emblem of the Royal Microscopical Society. The Glaishers had three children, Cecilia Appelina (1845–1932), James Whitbread Lee (1848–1928), and Ernest Henry (1858–1885).

See also: Negretti & Zambra; Piazzi Smyth, Charles; Reade, Joseph Bancroft; and Talbot, William Henry Fox.

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GLAISTER, THOMAS SKELTON (1824–1904)

Thomas Glaister was born 12 June 1824 in Holme Cultram, Cumberland, England. His father was a mariner who worked out of Maryport. Thomas trained as a carpenter but later became a druggist. In 1849 he married Elizabeth Gates, the widow of another mariner Joseph Metcalfe. Thomas worked as a druggist in Chicago and Woodstock, Illnois, then Burlington, Iowa before taking up photography, joining the studio of the Meade Brothers of New York. In November 1852 he landed in Melbourne and established a branch studio for the brothers in Melbourne. In 1855 after being joined by

his family Glaister moved to Sydney where he opened his own prestige daguerreotype facility in Pitt St. He photographed many eminent men and various places in Sydney and specialized in producing stereo images mounted in Mascher cases. In August 1855 John Watson opened a branch studio for Glaister in Brisbane. Daniel Metcalfe, Glaister's stepson trained in the Sydney studio and in 1864 he joined Robert Millington, the pair working as traveling photographers. In 1868 Metcalfe set up in Brisbane with his half brother Thomas Skelton Middleton Glaister. Their father operated his high class studio for 14 years but after it was destroyed by fire in 1870 he migrated to Sonoma County in California purchasing a vineyard and foregoing photography. He died there in 1904. His son "Middleton" succumbed to accidental cyanide poisoning in 1877.

MARCEL SAFIER

GODDARD, JOHN FREDERICK (1797–1866)

British photographer and popular scientific lecturer

Although little is known of his early years, Goddard developed an interest in science and became what today might be called a physicist. In 1838, he received a Society of Arts Silver Medal for his polariscope (an apparatus for experiments on polarizing light). He was a member of the British Association for the Advancement of Science in the early 1840s, by which time he was associated with two popular scientific establishments—the Royal Gallery of Practical Science, Adelaide Street (Royal Adelaide Gallery) and the (Royal) Polytechnic Institution in Regent Street—primarily as a lecturer on optics.

In 1840 Goddard became involved with photography. Richard Beard, who by that time owned the (English) daguerreotype patent, had also secured the right to use a reflecting camera invented by an American, Alexander Simon Wolcott. This did not work as well in Britain as it had in America, owing to the different climate, and exposure times were too long for successful portraiture, the main commercial application. To this end Beard sought advice from the Polytechnic Institution, and was recommended to employ Goddard, then engaged as lecturer on optics and natural philosophy at the Adelaide Gallery, who carried out the necessary scientific research at hired premises in Holborn. Goddard made good progress, though of a chemical rather than an optical nature. By September 1840, exposure times had been reduced from four minutes to one minute, but this was still too long.

He made further advances, announced in December, a day or two after Beard had completed his patent specification (incorporating Wolcott's work). Referring to his search for a way of making the daguerreotype plates more sensitive, Goddard claimed a valuable discovery; namely that when the bromide of iodine is used instead of simple iodine (as specified by Daguerre), this objective is achieved. But he did not give too much away, and the experiments continued. At the beginning of March 1841, Goddard deposited a sealed package containing laboratory notes made during January and February with the Royal Society. No doubt he did so in order to establish a priority claim for his work, should this become necessary. Other documents in the Royal Society's archives give additional practical details of his discoveries.

After assisting Beard at his London studio in 1841, Goddard took to the provinces. He was certainly in charge of Southampton's Photographic Institution by September 1842, holder of an exclusive licence for Hampshire and the Isle of Wight. What, if anything, had he paid for this? His (1847) advertisements in a little-known Southampton newspaper say: "Having for his important discoveries received of the Patentee a License for practising the science in Hampshire ...", it seems possible that he was rewarded by Beard, at least in part, by the grant of the Hampshire licence.

Goddard temporarily abandoned Southampton around July 1843. Perhaps the Photographic Institution did not support him adequately, or maybe he wanted to resume his career as a popular lecturer in London. However, he had not lost interest in photography. Although still in London at the beginning of February 1844, he was soon to be found at a new studio in Chester, where he remained for a couple of months. Goddard returned to London before the end of April, lecturing at the Royal Adelaide Gallery. However on 3 August 1844, the *Hampshire Advertiser* announced that Messrs Goddard and Mullins, from the Royal Polytechnic Institution, were taking portraits daily at No. 43, Pier Street, Ryde. Apart from an almost identical advertisement in the *Hampshire Telegraph*, this is the only evidence of what must have been another short-lived venture.

In May 1846, the *Hampshire Chronicle* announced the opening of Photographic Portrait Rooms in Winchester, conducted by Goddard and Alfred Barber, who had been the first professional photographer in Nottingham. In January 1847, Goddard was back in Southampton, though he seems to have departed by June of the following year.

There can be no doubt that Goddard fell on hard times. If he had not, probably much less would be known about him. The 1861 census finds the unmarried John F. Goddard, formerly Lecturer of Experimental Philosophy, in St. Joseph Alms Houses, Brook Green, Hammersmith. This deterioration in his circumstances was noticed by several well-established professional

photographers, including Cornelius Jabez Hughes, who drew attention to Goddard's plight in the photographic press.

The Goddard appeal launched by Hughes at the end of 1863 was not limited to the UK. One American periodical reprinted his article, sparking controversy over who had invented what, where and when. It must be remembered that, in the early, days several photographers working independently may have discovered much the same things at more or less the same time. In Goddard's case secrecy was paramount, on account of the English patent. Controversy grew to such an extent that Jabez Hughes felt obliged to address the matter again. He published articles, each in two parts, entitled "The Bromine Question and Mr. J. F. Goddard. Being two chapters connected with the early history of photography" in several journals. In the first part, Hughes reveals the existence of Goddard's sealed packet deposited with the Royal Society, printing its contents together with the latter's recent correspondence with the Society.

Goddard was not destined to benefit from his Testimonial Fund for long. Soon after his death in December 1866, controversy arose over what should become of the money raised on his behalf. Goddard had made a will in 1864, when the fund stood at not far short of £400, and his executor wished to dispose of the remaining money in accordance therewith. However the Committee administering the fund took the view that the balance should be returned to the original subscribers, and this view prevailed.

The intention had been to provide Goddard with an annuity, there being insufficient confidence in his judgment and prudence for him to be entrusted with the capital. Goddard resisted the annuity, although he did receive a small income from the fund (previously, a few well-wishers had supported him to the extent of each subscribing a guinea a year). As one commentator put it: "Whatever ability he may have possessed as a teacher of science, it is certain that he was weak in commercial matters."

RAYMOND TURLEY

Biography

According to the Parish Register of St. George, Bloomsbury, John Frederick, son of Thomas and Ann Goddard, was born on 8 December 1797, and baptized on 28 January 1798. His mother is probably the Ann Goddard who died at Chatham, Kent, on 16 November 1828. His father, Thomas (who died in 1842), was for many years Postmaster there, and had at least three other sons. John Frederick Goddard died on 28 December 1866, at the Middlesex Hospital, suffering from acute bronchitis.

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GODDARD, PAUL BECK (1811–1866)

American physician and photographer

Credited with being the first to introduce bromide in the sensitizing of daguerreotype plates, Goddard's improvement greatly reduced exposure times and enabled the use of daguerreotypy for portraiture. While working as an assistant in the chemistry department of the medical college at the University of Pennsylvania, Goddard collaborated with Robert Cornelius, a metallurgist and lamp manufacturer, in conducting daguerreotype experiments in the fall of 1839, and by early December of 1839 the two were producing portraits using bromide as an accelerator. Goddard was Cornelius's silent partner in first commercial portrait studio in Philadelphia which opened in May of 1840, and continued in operation until 1842. Born in Baltimore on January 26, 1811, Goddard graduated from Washington College (1828) and the medical college of the University of Pennsylvania (1832). He practiced in Philadelphia as a physician and surgeon in addition to serving as professor of anatomy at Franklin Medical College 1847–1852. He is best known as an editor of numerous medical books. Goddard was a member of the American Philosophical Society and the Academy of Natural Sciences, as well as medical societies at the local, state and national level. He served on the Philadelphia Board of Health 1859–1863, and as a surgeon in the Civil War 1863–1865. He died at his home in Philadelphia on July 3, 1866.

JENNY AMBROSE

GOERZ, CARL PAUL (1854–1923)

His name stood for some of the most advanced technologies in photographic trade at the end of the 19th century, and yet he was neither an inventor nor a scientist. Carl Paul Goerz, born in 1854 in Brandenburg,

two hours north of Berlin, was seen as a typical German enterpriser of the late 19th century. He installed financial framework, erected production lines, secured transport and trading facilities, and finally, found the right products to sell. Accoriding to him, anything else was a matter of expertise for which one could hire specialists. However, Goerz had the touch of King Midas, and nearly any optical or photographic good his eye fell upon often became, under his influence, a necessity for the industry.

Carl Paul Goerz was born in the small town of Brandenburg north of Berlin where he grew up. Around 1870, after middle school, he became an apprentice in merchandising with the optical company of Emil Busch in Rathenow, then one of the best known companies in this field. During the four years of his apprenticeship in Rathenow, Goerz learned everything he needed for setting up his own business. From the mid 1870s to the mid 1880s Carl Paul Goerz worked throughout Europe, mainly in Paris, as a sales agent for a number of German companies including Busch. The latter part of this time, he held shares of Eugen Kraus' agency, then well known for its distribution of optical instruments in astronomy and industrial use. In 1886 he returned to Berlin and opened up his first wholesale venue for optical instruments, presumably mostly selling Busch's products. When Emil Busch passed away in 1888, Goerz saw his chance for establishing his own ventures of production and assembly of pre-fabricated goods.

From the beginning his partnerhsip was with a friend, the photographer and inventor Ottomar Anschuetz, who not only provided Goerz with the economic use of his patent for a focal-plane shutter but with numerous advices as well for building easy-to-handle and simple-to-use cameras. In September 1888, Goerz worked with the Swiss theoretical optician Carl Moser who calculated the famous 'Lynkeioskop' lens shortly before his untimely death in 1891. He was followed bei Emil von Höegh, the inventor of the even more successful 'Dagor' lens and 'Hypergon' mentioned above. Anschuetz and Moser / Höegh each were the first of a long line of inventors, engineers, and physicists to work for Goerz; some of the best renowned theoretical opticians in Germany had at least been involved with this company as an important part of their career.

Goerz's cameras and lenses were part of every major development in photography between the 1890s and World War I. The miniaturisation of plate and film formats, from 9 × 12 cm in 1890 to 4.5 × 6 cm in 1908, was accompanied with both acclaim from photographic amateurs and fierce rejection by the critics in the papers. Easily transportable and designed for hand-held use, folding cameras were a special item of the Goerz company, and in 1910 it released the first type of camera with a lens pre-focused on it. Similar developments were encouraged by Goerz in the construction of lenses; from 1890 onwards a-planatic lense like the 'Lynkeioskop' were severe competitors to Voigtlaender's, Dallmeyer's, and Busch's similar products. The Daguerreotype lens was introduced in 1893 and became an instant success: 30,000 units sold in three years, and by 1911 the output increased to 300.000 pieces. In 1900, the Goerz company brought out the Hypergon lens which is sometimes remembered as one of the most remarkable constructions in photographic history consisting of an a-planatic lens with a wide angle of 110°, without any distortion or spherical aberration. At the same time, Goerz found world-wide acclaim and success for its large scale reflectors, projection devices, and panoramic binoculars which were mainly used for military purposes.

The company was open to any invention dealing with photography. From its earliest days in 1888, it produced exposure meters. From 1890 onwards, it was the first supplier of the Anschuetz type focal-plane shutter and, of course, there was a full production line of cameras furnished with this device; its brand name was Ango, made of Anschuetz and Goerz. In 1905 the first colour slide projector after Adolf Miethe's three plate system was built and sold, succeeded by a long line of similar devices. In 1907, Goerz launched the first industrially produced yellow glass plate as filter for landscape photography. By 1908 and the start of the company's partnership with Joseph Arthur Berson, a long line of balloon cameras started to be produced, to be followed by a number of air survey cameras after 1913. And in 1910, Goerz built one of the earliest so-called 'night cameras' with especially designed lenses and shutters for journalistic uses. Considering all of these successes and novelties in one company history, it is remarkable to note that its founder and all-time leader was neither a chemist nor a physicist, and by no means a scientist but instead an entrepreneur par excellence.

Goerz knew what he owed to his workers and employees, and he gained a certain fame with the early introduction of social benefits for them. In 1894, the company inaugurated the average working week of 48 hours; and in 1897, all of his company men received two weeks of fully paid holidays each year. The company later moved to new buildings in 1898, which had a statue five meters height in front of the building, honoring photography. By this time, the name Goerz incorporated glass and film production as well as cameras, lenses, and binoculars. With the launch of several products for military use after 1905, the necessity arose for opening a number of branches in Europe, the United Kingdom, and the United States which included production lines as well as distribution offices. In 1917, the company was at its largest size with more than 10.000 employees, and it even survived both the German revolution of 1918 and the depression of the early 1920s.

Carl Paul Goerz passed away in January 1923. Three years later, his company was one of four to form Zeiss-Ikon. In the year of Goerz' death a cheap box camera was launched under the brand name Tengor which was the first one to be completely transferred into the new company's name—and produced until the late 1950s. Other Goerz products are more difficult to trace but still earn a high reputation for both the company and its founder for being at the very top of industrial quality and technical innovation for their time.

ROLF SACHSSE

Biography

Carl Paul Goerz, born in Brandenburg, Havel, July 21, 1854. Apprentice as merchant in Emil Busch's Company of Optical Instruments at Rathenow, Berlin, 1870–74. Sales agent for German optical and mechanical instruments companies in Europe, mainly in Paris; several years as participant in the company of Eugen Kraus, Paris, 1875–86. Return to Germany and opening of a wholesale agency for optical instruments and drawing aids in Berlin-Friedenau, 1886-88. Producer of cameras and lenses in his own company from 1888. Opening of subsidiary companies in the United States, the United Kingdom, France, and Italy, 1905-09. Died in Berlin, January 14, 1923. The company was one of four to form the Zeiss-Ikon Company in 1926. Since then the brand name Goerz has been used for several venues of minor importance.

See also: Busch, Friedrich Emil; and Daguerreotype.

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GOLDENSKY, ELIAS (1867–1943)
American photographer

Elias Goldensky built his reputation as one of America's eminent portrait photographers by producing artistic prints that were as individualized as his sitters, many of whom were celebrities. Born on September 9, 1867 in Ukraine to a Russified Jewish family, his father was an oculist and photographer. Immigrating to Philadelphia, Pennsylvania in 1891, Goldensky opened his first portrait studio in 1895. He briefly associated with fellow Pictorialists Alfred Stieglitz and F. Holland Day after exhibiting work at the National Academy of Design in New York and the Pennsylvania Academy of the Fine Arts in Philadelphia in 1898. An early practitioner of color photography, Goldensky used the gum bichromate process and different papers to lend color and texture to his personalized prints, characterized by soft tones and intimately depicted sitters. Recognized as both a commercial and artistic photographer, he received numerous international awards and widely demonstrated and lectured on his techniques. Goldensky served on the board of directors of the American Museum of Photography and was a member of the Photographic Society of Philadelphia, the Camera Club of New York, and the Salon Club of America. He died in Philadelphia on March 10, 1943. The George Eastman House holds the largest collection of his work.

CHARLENE PEACOCK

GONNET, ESTEBAN (1830–1868)
French surveyor and photographer

This French man appeared in Argentina by 1858, receiving a license of surveyor by 1859. In 1864 he announced at the newspapers his photographic activity from a studio in downtown Buenos Aires.

During the rest of his short life he worked both as photographer and surveyor.

His studio Fotografía de Mayo was located at 25 de Mayo street, where he make portraits. He also produced very early albums of views from Buenos Aires urban and rural views, titled "Recuerdos de Buenos Aires" and "Recuerdos de la campaña de Buenos Aires."

His activity as surveyor gave him the opportunity to visit estancias, being an early the recorder of rural scenes. He traveled along a large part of province of Buenos Aires, working in many small cities.

He passed away very young, in 1868.

All known production is in albumen prints, never signing them, except by his rubber stamp "Fotografía de Mayo."

Many of his early photo historical studies attributed wrongly to Benito Panunzi.

ROBERTO FERRARI

GOOD, FRANK MASON (1839–1928)
English photographer

Good was a professional photographer who lived at Hartley Wintney in Hampshire. He joined the Photographic Society of London in 1864 and showed several landscape studies at that year's annual exhibition. Most of the works exhibited were made in the southern English counties of Hampshire, Surrey, Dorset and Devon. Along with his landscapes he also produced flower

and tree studies. Many of his views were published in early photographically illustrated books and as stereo cards.

He made up to four trips to the Near and Middle East in the 1860's and 1870's, producing whole-plate prints and stereo views, many of the images being signed Good or monogrammed FMG in the negative. His Middle Eastern views were published by both Francis Frith and W.A. Mansell & Co. Frith commissioned Good's first trip to the Near East and later published his views of Malta, taken during his return from Constantinople and Egypt in the winter of 1871/2.He may have been Frith's assistant at one time.

Good's output, particularly his Middle Eastern work, is distinctive and of high technical and artistic merit, especially when the difficulties of working with wet-collodion in remote areas is taken into consideration. He has been generally overlooked as a photographer.

IAN SUMNER

GOODWIN, HANNIBAL (1822–1900)

American photographer and inventor

"His experiments culminated in 1887 in the invention of the photographic film. As a memorial to the inventor of the device that has proved so potent for the instruction and entertainment of mankind this tablet is erected." So reads the memorial tablet to Hannibal Goodwin, the inventor of celluloid rollfilm.

The Reverend Hannibal Goodwin, born in Tompkins Country, New York, and an Episcopal rector in Newark, New Jersey from the mid 1860s, turned to photography as a means of illustrating the talks he gave to children and local organisations. From 1867, until he retired from church life in 1887, his illustrated talks were a regular part of his Sunday Schools.

Using gelatin dry plates, he became interested in the idea of reducing the weight of materials he had to carry with him on location. His experiments led him to the creation of a celluloid film "especially in connection with roller cameras" and he applied for a patent for it in May 1887. For unexplained reasons—although some writers hint at a sustained campaign of obstruction by George Eastman—final patent protection was not given until 1898, by which time Eastman had already introduced his own flexible celluloid rollfilm.

Goodwin was almost ready to go into production with his roll film when he was killed in a traffic accident. His business interests were sold to Anthony & Scovil (Ansco), and courts eventually ruled that Eastman had infringed his (rather loosely specified) patents, resulting in a multi-million dollar payout.

JOHN HANNAVY

GOUIN, ALEXIS-LOUIS-CHARLES-ARTHUR (d. 1855)

French photographer

Gouin was supposedly born in New York at the end of the 18th century. His exact birth date remains unknown like the details about his parents and childhood. After his arrival in Paris, he studied painting at the Fine Arts Academy where he received the teaching of Jean-Baptiste Regnault, admirer of Raphaël and creator of many important historical paintings. Next, he worked in Anne-Louis Girodet's (1767–1824) studio, a pupil of David, both neoclassical and romantic painter, who excelled in lighting effects and in disrupting contemporary norms of sexuality. The production choices and fine colourings of Gouin's negatives ilustrate this pictural legacy without being a strict imitation.

Gouin assessed the value of this new medium, so, such as attests the obituary published in the *Humphrey's Journal*, he was one of the first to engage in photography after the daguerreotype process became public knowledge. However, his name only appeared in the Bottin, the Parisian Business register in 1849 (at rue Basse-du-rempart, 50). Working with his wife and his daugther, Laure (the dates of his wedding and daughter's birth are unknown), who hand-coloured his photographs, he met Bruno Braquehais, who was previously a litographer in Caen, around 1851. Gouin moved to rue Louis-le-Grand, 37, and invited Braquehais to join his studio (until 1852). The same year, he created a machine for polishing daguerreotype plates—the photographer Bertrand affirmed at its subject that if he could do 150 plates per day, it was only thanks to the Alexis Gouin's remarkably fast machine—and a photometer, which was a precision instrument that measured luminous flux and intensity. He received a medal of honourable mention for his coloured daguerreotypes at the London Exhibition. Nevertheless, his inventions were never mentioned. In September however, his name appeared among the souscriptors list to erect a memorial in remembrance of the heliography inventors, Niepce and Daguerre.

Then he began producing stereoscopic daguerreotypes of female nudes. Other photographers such as Belloc, Derussy, D'Olivier, Duboscq-Soleil, Moulin and of course Braquehais, also used this process to create women Académies and erotic studies. These images were often anonymous or secretly diffused because of the "good taste" and the censorship that judged them too "natural" or too "real," the hand-coloured stereo nudes particularly. But with this process, Gouin signed as well quite famous portraits of several personalities of the period. Among them, those of Camille Saint-Saëns, that Gouin presented with some bright hair, a lively and inspired eye, a quill in the right hand, and in the left, the Berlioz score "Lélio" for which the french composer made the piano reduction.

He also portrayed the sculptor James Pradier, his sister, and the *Trois Mousquetaires* author, Alexandre Dumas, who seemed to be young and laughing.

Alexis Gouin produced a major part of his known images from this time until his death in 1855. According to an obituary column written by Lacan in *La Lumière*, Gouin succumbed to death "after one of those cerebral affections that struck like lightening." Gouin's widow, and daughter Laure, who became Braquehais' wife, all inherited the studio.

Afterwards, Mrs Gouin maintained her miniaturist skills and put Gouin colours up for sale and placed an advertisement, which was frequently published on the last page of *La Lumière* from 1856 onwards: "Gouin colours. Colour of such great reputation that Mrs. Gouin has decided to put them on the market. 75c for each tube, 1fr for carmine. Box of colours with compartments and drawers, consisting of an assortment of 12 tubes of colour, a gold and a silver receptacle, and 6 brushes, all for the price of 15fr. A special depot has been set up with Alexis Gaudin & Bros. At rue de la Perle, 9."

The "Gouin's firm" continued creating images during the decade and the pictures produced were quite similar so much so that Lacan underlined Laure and her mother's talent which didn't keep him from wondering about Alexis Gouin's real part in the work. Mrs Gouin died in 1863 and the studio was transferred at Boulevard des Italiens, 11, where the Braquehais couple worked for several years.

Gouin's negatives were recognized for their quality and poetry, and several contemporaries' statements proved it, particularly the discussion of a meeting at Lacan's, 15 days before Gouin died, which was published in *La Lumière*: "…. It is inconceivable to come closer to perfection. His bodies are alive, their flesh throbs before our eyes. Nature has been captured on the spot and translated into poetry through the talent of a painter." He was praised too with the descriptive phrase "The French Claudet" or "The Claudet of Paris" and according to E. Lacan, "this comparison is very natural." Indeed, as well as Antoine Claudet, Gouin was commonly considered a master of the stereoscopic images. But their works differienciate themselves, especially in the field of colour use. While Claudet's portraits contain very few colors (some plates are even uncolored) which the major part is not modified, Gouin's show the use of a large number of colours often mixed with white and neutrals. In her book, Janet E. Buerger affirms for that matter even a black pigment was found on one Gouin's plate, extremely unusual thing on daguerreotype where the polished surface of the plate naturally produced deep black effects. Therefore Gouin is above all received as a fine colourist caring on effects and composition and Claudet as a technician with a classical making, nearer from the Victorian style.

Gouin's photographs reside at the Musée d'Orsay (Paris), George Eastman House International Museum of Photography and Film (New York), Agfa Foto-Historama (Cologne) and in several private collections like Derville (Paris) Nazarieff (Geneva), Van Keulen (Amsterdam), Auer,(Geneva) or Briechle (Munich).

At present, although he was absent from most of the great books on the subject, his work is shown in texts and in daguerreotypes and photography exhibitions. The last exhibition where appeared his pictures took place at the Metropolitan Museum of Art in New York from September 23, 2003 to January, 4, 2004.

FRÉDÉRIQUE TAUBENHAUS

Biography

Gouin was born in New York at the end of the 18th century. Pupil of Regnault and Girodet, he was one of the first photographers to use the daguerreotype process. Working with his wife and daugther, who hand-colored his negatives, from 1849 (date of his inscription in the parisian business register), he met Bruno Braquehais towards 1851 and invited him to join his studio (until 1852). From this time to his death in 1855, Gouin devised a photometer and a machine polishing daguerreotype plates. He get a honourable mention at the London Exhibition and portrayed, among others, Alexandre Dumas, Camille Saint-Saens and James Pradier. With the stereoscopic daguerreotype process, he made series of female nudes. His contemporaries praised his photographs for their subtility and quality so that he was called "The French Claudet." His daughter married Braquehais in 1856 and the Braquehais-Gouin's firm produced colours and images during a decade.

See also*:* Braquehais, Bruno; Claudet, Antoine-François-Jean; Daguerreotype; Stereoscopy; and Nudes.

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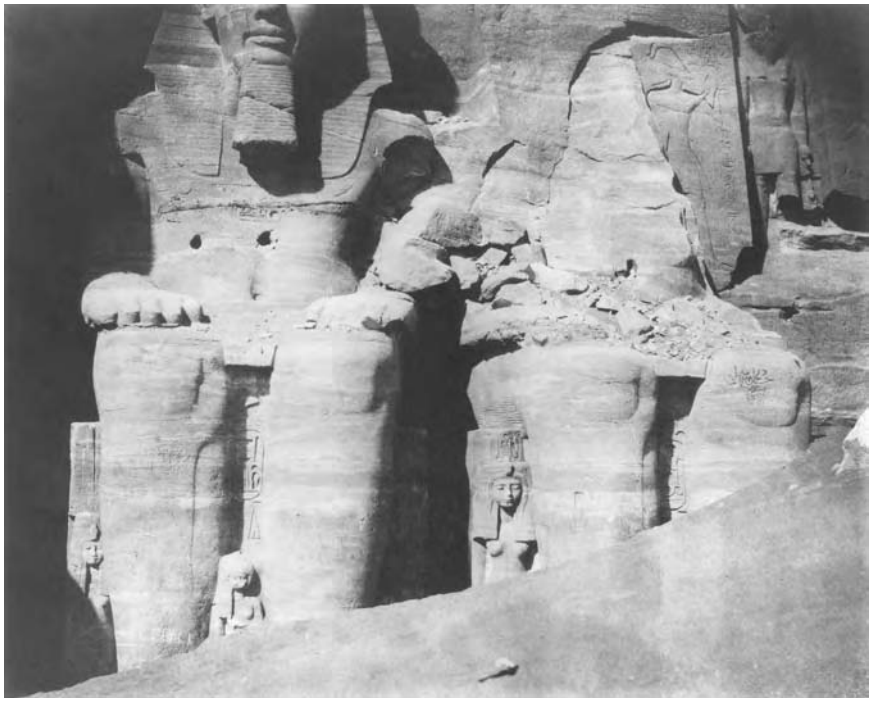

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GOUPIL & CIE (active 1850–1884)

French art publishers and art dealers

Henry Rittner (1802–1840), a young German immigrant with experience in the London print trade, opened a print establishment in Paris in 1827. This was the beginning of what was to become the most powerful art-publishing company of the nineteenth century. Two years later, Rittner formed a partnership with Adolphe Goupil (1806–1893), second son of a pharmacist and, through his mother, a collateral descendant of the rococo painter, François-Hubert Drouais. The Maison Goupil—Rittner & Goupil and its successors—remained in business for almost a century, until the ultimate successor, Manzi, Joyant & Cie, ceased active operation in 1917. In 1921, a print dealer from Bordeaux, Vincent Imberti, acquired all of the remaining stock: hundreds of thousands of prints, photographs, engraved copper plates, glass-plate negatives, illustrated books, and archival documents (although in this last category there were many gaps). In 1987 and 1990, Guy and Gabrielle Imberti ceded what remained from this ensemble to the City of Bordeaux, which placed it in a new museum, the Musée Goupil.

From 1829, Rittner & Goupil published as well as sold prints from their premises in the Boulevard Montmartre and distributed them through correspondents in Europe and the United States. After Rittner's death, Adolphe Goupil admitted two new partners, Théodore Vibert and Alfred Mainguet. During the 1840s the three partners built a vertically integrated business with its own printing facilities and, as of 1846, an art gallery. After buying original artworks (including copyrights), the firm commissioned every kind of relevant reproduction, finally selling both the original work (usually retaining the copyright) and its various reproductions at a substantial profit. To expand distribution, they opened branches abroad, beginning with New York in 1848, then London, Berlin, The Hague, and Brussels. By the 1860's, a multinational empire was in place. Goupil & Cie was at the very heart of an informal, international network of art dealers and publishers, all of whom distributed one another's merchandise—paintings, prints and photographs. Apart from Goupil, this network, constituent parts of which remain in existence today, included Colnaghi, Agnew, and Gambart in England, Sachsé in Berlin, Van Gogh in The Hague, and Knoedler in New York. Michael Knoedler had been Goupil's New York manager, arriving in the city in 1852, and although he purchased the branch for his own account in 1857, his house remained intimately allied with the parent firm until the end of the century.

Because they made it possible to generate multiple prints from a single negative, William Henry Fox Talbot's discoveries were highly applicable to publishing. The Maison Goupil first showed interest in photography when they co-published the groundbreaking *Excursions daguerriennes*, completed 1842. In May 1853, the company released the first installments of major photographic publication: Félix Teynard's *Voyage en Égypte et en Nubie* (160 plates in total), Benjamin Delessert's *Notice sur la vie de Marc-Antoine Raimondi* (67 photographs mounted on 59 plates in total), and, as a single plate, Gustave Le Gray's *Portrait of Napoléon III*. Though not attributed in Goupil's catalogue, the series

Paris photographié (30 plates) was due to François-Auguste Renard. This initial releases also included a series of views, monuments, landscapes, seascapes, and gothic architecture entitled *Excursions photographiques* (30 plates, and "more each day") by Le Gray, Henry Le Secq, and others referred to as "the most distinguished photographers." In October 1853, Edouard Baldus' eleven plates reproducing the stained-glass windows for Sainte Clotilde church in Paris appeared. Goupil's catalogue of that date advertised that: "One can find at Messrs. Goupil & Cie all of the most remarkable achievements that were obtained in photography of all genres; views from Italy, Switzerland, Spain, studies of landscape, architecture, and figure, etc., by the most distinguished artists. Each photographic plate can be sold separately, price range is from 2 to 25 francs, according to the size and importance of the subject." The next catalogue (June 1854) featured Baldus (*Monuments, vues générales et tableaux*, 25 plates), the Bisson brothers (*L'œuvre d'Albert Dürer*, 104 plates, and *Vues de Paris*, 16 plates), Giroux, (*Vues d'Auvergne*, 32 plates), Grillet (*Vues de Pompéi*, 17 plates), Kier, (*Vues de Venise*, 32 plates), Le Secq (*La Cathédrale de Reims*, and *Études de paysage*, 32 plates each), Le Gray (*Études diverses*, 40 plates), Friedrich Martens (*Vues de Suisse*, 36 plates), and Joseph Vigier (*Vues des Pyrénées*, 38 plates).

The catalogues hardly mention photography again until 1858 but the June 1854 stated: "Our collection of photographs contains everything remarkable which has been made until now in France and abroad. It is impossible to list in our catalogue all the sheets from this collection, hence we will only quote some of the most important." Some of Goupil's important publications (such as Charles Nègre's *Midi de la France*, 1854, 10 plates) are not listed, which makes analysis difficult. However, this first incursion in the realm of photography showed the extent to which Goupil considered the new medium merely a tool applied to a general publishing policy. Photographs had their own section in the catalogues, beside "Engravings," "Lithographs," "Collections," and "Studies." Names of the photographers usually appeared, and prices were comparable to those for prints—less than for engravings, but more than for lithographs, on average. The format itself mimicked the formulas used in the print trade, with carefully designed and printed letters, bearing all the customary information and the publisher's address. Appropriating the tradition of printmaking was not specific to Goupil but was a general trend in photo-publishing's early years. Martens' *Vues de Suisse* epitomized these intricate relationships between photography and printmaking. Not only was Martens a successful engraver, published by Goupil since the 1840's, but his Swiss photographs were interpreted as color lithographs by Eugène Cicéri, in two sizes, both published by Goupil (1859–1864). Though representing the same subjects, the photographs and lithographs were not aimed at the same market. Goupil's marketing talent was to identify various distinct clienteles and to tailor publications to their specific needs.

The subjects of Goupil's early photo publications were consistent with their print publications. The only portrait, Le Gray's *Napoleon III* ("in civil costume") fitted into the long sequence of official or more casual portraits of the emperor that Goupil published in every possible size and technique, and with a wide range of prices. The emphasis on topographical and picturesque views, architecture and travels echoed the numerous views published by the Maison, especially as lithographs. Reproduction of works of art formed the other important category, with Delessert's celebrated reproduction of Raimondi's prints, and Baldus' photographs of stained-glass windows. Goupil would eventually specialize in fine-art photographic reproductions capitalizing on his experience as a print publisher.

After the first wave, photographs re-appeared in 1858, when Goupil created the *Galerie photographique*, the first of his extensive series of reproductions of works of art. The *Galerie photographique* grew to 1,779 items by 1894. Five other series would follow: *Musée Goupil & Cie* (1860), *Cartes de visite* (c. 1863), and *Cartes album* (Cabinet cards, 1872) amounted to more than 1,100 items each by the end of the century. Less important, *Photographies d'après les grands maîtres* and *Album de photographies* appeared in 1860 and c1863, respectively. For the most part, the six major Goupil photographic series were devoted to contemporary art (almost exclusively painting), carefully selected at each Salon. Though Goupil installed a semi-clandestine photographic studio in the Louvre in the 1880's (*État des lieux* 2, 1999, 129), reproductions of old masters were the province of other firms, such as Braun. From the constant flow of Goupil art reproductions would only emerge few "direct" photographs, such as Louis Rousselet's *Voyage dans l'Inde* (c. 1870, 160 plates) or Auguste-Rosalie Bisson's *Vues d'Italie* (c. 1870, 56 plates).

In the beginning, Goupil had no photographic facility but commissioned the printer, H. de Fonteny (responsible for printing Teynard and Nègre portfolios), and professional photographers, chiefly Robert Bingham, but also C. Michelez and Henri Voland, all specialists in art reproduction. An in-house photographic studio opened in 1860, directed by Henri Rousselon (1822–1902), an engineer. Initially limited to the production of albumen prints, this facility soon made the wet collodion negatives itself, and by 1862, Goupil's flourishing photo-publishing activity was autonomous. In 1869, the firm opened a large factory in Asnières, thereby gathering under one roof all its technical and

manufacturing activities, be they related to photo or print publishing. Driven by steam and electricity, the Asnières plant embodied modernity—but not from a social viewpoint: in 1880, of the 107 persons working there, nine were children.

In the most logical way, considering its experience in print publishing, the firm's interest in photomechanical processes began early. In 1853, it was part of the photolithography venture and co-published the *Premier Cahier de Lithophotographie* (6 stunning plates obtained with the Lemercier, Lerebours, Barreswil and Davanne process, from negatives by Le Secq). In 1867, Goupil bought from Walter Woodbury an exclusive license for the exploitation in France of the Woodburytype process. In 1870, he sold back secondary licenses to Lemercier and Braun. Meanwhile, the Asnières factory produced Woodburytypes on an industrial level. A single worker could print 500 copies of the same image in one day. Surprisingly, Goupil did not advertise the process in his catalogues, whereas he could have promoted its permanency, which was a major issue at the time. For Goupil, Woodburytype was more a step forward industrialization than a victory over the self-degradation of albumen silver prints. Both processes always co-existed, and the same reference in the *Carte de visite* or *Galerie photographique* series may often be found both as albumen prints and Woodburytypes. The selection of the process probably depended upon the quantity of prints needed at a given time. The excellent quality achieved at Asnières led other publishers to commission Goupil for their own productions—as was the case for Baschet's famous *Galerie contemporaine* (1876–1884).

Goupil stopped producing Woodburytypes at the beginning of the 1880's. Meanwhile, Rousselon had perfected another photomechanical process, the photogravure. This was another demonstration of Goupil's modernity: constant experimentation and refinement of technologies, developed in-house. Rousselon was encouraged to work on a photomechanical process compatible with intaglio printing. Capitalizing on Woodbury discoveries, he found a way to obtain a special grain on the dichromate gelatin, suitable for retaining ink. This grain appeared on the subsequent lead mold, which was itself copied on a copper plate by electrotyping. Rousselon presented his process at the Société Française de Photographie in 1872 (seven years before Karel Klič's process), and Goupil released his first photogravures in 1873. The results were superb; no other firm ever achieved such quality and accuracy, neither in Europe nor in the United States. The process earned many awards in international exhibitions throughout the decade. Thousands of photogravures reproducing artworks were mass-produced, along with a few topographical photographs, such as those illustrating Auguste Mariette's *Voyage dans la Haute Égypte* (1878). Other publishers, especially Americans (Gebbie & Barrie, and Appleton), commissioned photogravure printing from Goupil; in the United States, the process was often called "Goupilgravure." As with any intaglio plate, these could be printed with several colors (up to 20), offering dramatic results. This was the case for the luxury portfolio *Les Dessins de Auguste Rodin* (1897, 125 copies).

Rousselon retired in 1884, to be replaced by a young Italian engineer, Michel Manzi (1849–1915), who, from 1897 to his death, co-directed the company with Maurice Joyant (1864–1930). Manzi introduced a photomechanical process of his own: *typogravure*. Based upon block printing, similar to half-tone processes, it allowed simultaneous printing of photograph and text. Thenceforward, the Maison Goupil published photographically illustrated books and magazines: *Le Figaro Illustré* (1890), *Les Sports Modernes* (1898), *Le Théâtre* (1898), *Les Modes* (1901), *Les Arts* (1902), and *L'Hygiène* (1909). However, in spite of this shift in its publishing policy, the firm slowly declined and failed to survive World War I and Manzi's death. Both the academic art they promoted and the very products they manufactured were out of fashion. After forming the most significant part of the media explosion of the 19th century, reproductive prints and photographs, sold either as individual plates, or in series or portfolios, had virtually disappeared, a circumstance fraught with consequences for the dissemination of art, as well as for its production.

Pierre-Lin Renié

See also: Copyright; Colnaghi, Paul and Dominic; Agnew, Thomas, and Sons; Talbot, William Henry Fox; Teynard, Félix; Delessert, Edouard and Benjamin; Le Gray, Gustave; Le Secq, Henri; Baldus, Édouard; Bisson, Louis-Auguste and Auguste-Rosalie; Giroux, André ; Martens, Friedrich ; Vigier, Vicomte Joseph; Nègre, Charles; Cartes-de-Visite; Cabinet Cards; Braun, Adolphe; Bingham, Robert J.; Albumen Print; Wet Collodion Negative; Photolithography; Davanne, Louis-Alphonse; Lemercier, Lerebours, and Barreswil; Woodbury, Walter Bentley; Woodburytype, Woodburygravure; Galerie contemporaine (1876–1884); Photogravure; Société Française de Photographie; Half-tone Printing; Archaeology; Architecture; France; Permanency; Photographic publishers; Photography of paintings; Photography and reproduction.

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GOVERNMENT PRINTERS

The 19th century saw the rapid growth in the establishment of government printers required to supply public documents. A number of these printing offices were also centres of technological experimentation and played a significant role in developing and exploiting photographic and photomechanical processes.

The most influential Government printer during the majority of the 19th century was in Austria. The Kaiserlich-königliche Hof- und Staatsdruckerei (Imperial and Royal Court and State Printers) was founded in 1804. By the end of the 1840s it had a photographic department founded by its Director, Alois Auer (1813–1869) who placed Paul Pretsch (1808–1873) as a manager of the department. This state printer also heavily influenced the Russian State Printing Office.

As Director-General of the British Ordnance Survey, Colonel Sir Henry James (1803–1877) successfully exploited photozincography to save thousands of pounds a year in the reproduction of maps. James used photozincography to reproduced important national manuscripts, particularly the 11th century Domesday Book published from 1861–1863. In 1867 James used the Albumen print process to create illustrations to *Plans and Photographs of Stonehenge, and of Turusachan in the Island of Lewis.*

The königlich-preußischen Staatsdruckerei (Royal Prussian State Printer) was founded in 1852 and was incorporated into the Reichsdruckerie in 1879. In 1883–4 a new 'Chalcographic Department' was established for the photomechanical reproduction of works of art, using photography, heliography, collotype, lithography, chemography, copper engraving and electroforming.

ANTHONY HAMBER

GRAF, HEINRICH (active 1860s–1870s)

Little is known about Heinrich Graf, to the degree that sometimes his name also appears as Graff. There is evidence that he came from Berlin, worked in several German countries, most prominently in Altona near Hamburg where his photographs are collected now. Besides being a portraitist of some fame and good quality, he covered the Prussian-Danish war in 1864-65 alongside to the Swiss Charles Junod and Friedrich Christian Brandt. His war photographs concentrate on portraits of staff officers in ambient settings. What has survived of his work are albumen prints made after the wet collodion process.

The spelling Graff came from some etchings made after his photographs in German newspapers. These photographs show members of the Prussian Royal Court in Berlin throughout the 1870s, mostly at military parades

and official occasions. There is no record of Graf/Graff after these years.

ROLF SACHSSE

GRAFF, PHILIPP (1814–1851)
Berlin daguerreotypist

Philipp Graff, born 1814 in Berlin, was like his father Philipp Graff senior, an optician. Early on, he was engaged in the construction of photographic apparatus, and in 1840, he began daguerreotyping opening a portrait studio, in which he also received commissions from the Prussian royal family, in 1843. Graff was famous for his painted city views, which he used as a backdrop and was one of the first daguerreotypists to advertise by putting photographs in his shop window instead of, in the usual way, by advertising in the papers. He trained many photographers, of whom the best known was Richard Scholz. Graff is well known for his *Graffsche Mischung* [Graff's mixture]—a method to heighten the sensitivity of the plates which was very popular. After Graffs death on 7 March 1851 his widow continued the business until it was taken over by August Beer in 1854 who then employed Leopold Ahrendts. Most of his daguerreotypes are kept in the *Kupferstichkabinett* Dresden, the *Stiftung Stadtmuseum* Berlin and the *Museum Ludwig/Agfa Photo-Historama* Cologne.

STEFANIE KLAMM

GRAHAM, JAMES (1806–1869)
Scottish itinerant photographer

James Graham's photography provides a more accurate account of the personal journey of the traveller of that time than any of the bought 19th Century albumen prints, purchased as souvenirs, because they are unhindered by notions of commercial, and possibly even artistic success. They can be contrasted with the new commercial travel photograph, the albumen print, which depicted known stage sets for a knowing public; rather, Graham's images are often private and personal. Yet while they provide a unique document of precise moments, even to the extent of tracing a walk through the landscape on a particular day, they intriguingly do not reflect the life and harrowing times that Graham lived through and took part in, especially in Jerusalem. They are, instead, desired realities. He was to ignore the remarkable detail embedded in his waxed paper negatives in favour of tone, characterised by a deep, rich yellow or brown which produced a brooding melancholy, as befitted this argumentative and principled Scot. They included some of the earliest photographs of Jerusalem and the Holy Land

James Graham (1806–1869) was the sixth and youngest son of Alexander Graham of Lymekilns and Fereneze in Scotland and Margaret, daughter of John Cochrane, banker. He was the younger brother of Elizabeth and Agnes, and he succeeded to part of the family estate near Barrhead, Renfrewshire, after the death of his eldest brother Patrick Graham Barns (1793–1867). Graham remained a bachelor and none of the family appears to have had any issue. After the failure and loss of his money as a banker, perhaps associated with the notorious and long running collapse of the Western Bank of Glasgow which finally closed in 1857, Graham took up a new career as a lay missionary. He became the Lay Secretary of the London Society for the Promotion of Christianity amongst the Jews (The London Jews Society) and joined the Mission in Jerusalem in 1853, aged 47. He stayed 5 years and departed in 1857.

Elizabeth Finn (1825–1921) and her husband James Finn (1806–1872), British Consul in Jerusalem (1846–1863), founded the Jerusalem Literary Society in 1849 where the 'only subject excluded was religious controversy.' This Society no doubt helped to bring about the foundation in London of the Palestine Exploration Fund in 1865 with the support of the Archbishop of York and the Dean of Westminster, 'for the purpose of investigating the archaeology, geography, geology and natural history of the Holy Land.' The aim was to 'illustrate the Bible,' that is, obtain documentary evidences of the scriptures. Elizabeth Finn contributed frequently to the Palestine Exploration Fund's publications between 1869 and 1892 and later donated to them her collection of photographs, which included a substantial collection by James Graham. She had been shown the use of the calotype by the Rev. George W. Bridges (1788–1863) on his visit to the Holy Land in 1850 and thought it would be a useful addition to fund-raising by selling photographs to itinerant Christian travellers in the Holy Land and also sending them back to Britain. Graham took up calotype photography just before his arrival in Jerusalem in order to aid this mission work. A Jewish convert from the American Baptist Church, Mendel John Diness (1827–1900), became his helper and pupil, and Graham subsequently sold Mrs Finn's unused camera equipment to him. Thus James Graham reputedly became the first resident photographer in Jerusalem and Mendel Diness became the first indigenous Jewish photographer in Palestine, although he may have also helped in that capacity the Rev. James Turner Barclay, physician and also photographer, who founded the American Christian Mission in Jerusalem in 1851 and employed the converted Diness as his translator. Barclay had an 'excellent French photographic apparatus' and could have been photography before Graham's arrival. Diness was to practice photography after Graham left,

eventually emigrating to the United States in 1861, firstly as a photographer, then he became a lecturer and finally an evangelical minister.

James Graham became a travelling companion to British and American visitors and entered the world of art in 1854 and 1855 when he chaperoned, accommodated and befriended two Pre-Raphaelite painters: Thomas Seddon (1821–56), the first Pre-Raphaelite painter to enter a national collection with '*Jerusalem and the Valley of Jehoshaphat from the Hill of Evil Counsel'* (1854, bought by the National Gallery, London 1857), which much resembled a Graham photograph of the same view, together with Holman Hunt (1827–1910). Both Seddon and Hunt used Graham's photographs, including Graham photographing the goat for Hunt's famous painting '*The Scapegoat*' (1855). In his diaries Hunt described Graham as 'a churchman with a strong tendency of Presbyterianism' and that he was 'prosy and an incorrigible procrastinator.' He was a man of rigid principles but also outspoken against injustice. Hunt was to join Graham in his growing criticism of the treatment of the Jewish Christian converts and their appalling conditions under the bishopric of Bishop Samuel Gobat (1799–1879); both were to issue protest pamphlets in Britain. Jewish converts were totally economically dependent on the Christian community for work or charity as the Turkish rulers had as much contempt for them as the Jews. Like the Finns, Graham befriended the Christian Jews and became increasingly criticised by the church for 'indulging too much in the society of worldly people.' Such complaints to the British establishment resulted in his dismissal in 1856 and later brought down the Finns who were recalled. Throughout, Graham had a peculiar access to those of importance but little is known of his activities after leaving Jerusalem: he is known to have travelled to Syria, Rhodes, Egypt, and frequently to Naples, where he photographed extensively, at least for seven years between 1857-1864, but probably until c.1868. He died in Paris in 1869 on his way from Scotland to winter in Naples. He made an extensive tour round the Gulf of Naples using waxed paper negatives and produced a remarkable set of photographs which included probably the earliest calotypes of Capri, Ravello and Scala, and some of the finest of Pompei. In Naples he assisted the Anglican community with the building of Christ Church (1865), the first Anglican church allowed in Southern Italy. This including negotiating with the Italian government over the site for the church promised by Garibaldi to the Anglican community in 1860 when he 'liberated' Naples.

Although Graham began to copyright his images from 1862 onwards, his photographs are extremely rare as he never became a commercial photographer, although, in later life, some of his prints were used for reproductions, particularly Biblical texts; rather he appears to have used them to put into albums for presentation to family and friends. Throughout he remained with the 'out of date' paper negative. Not particularly known in the annals of photography, he nevertheless exhibited in exhibitions at Crystal Palace (1855 and 1864) and in 1859 in Paris (where he had an address) where his *'Voyage à Jerusalem'* of some 50 images found much favour.

Alistair Crawford

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GREAT BRITAIN

Composing a national survey is a difficult task; it requires attention to a wide range of practices and can induce an excessive focus on canonical pictures and 'inventions.' More significantly, it is hard to avoid the ideological assumptions embedded in a 'national tradition.' During the nineteenth century the British nation was in the making and there were plenty of Brits abroad whose images count among the highpoints of 'British photography,' while quite a few photographers working in the British Isles were emigrants or passage migrants without whom 'British photography' would be very different. The story is further complicated, because at the time Britain was the foremost Imperial power. The photographs produced in parts of the globe coloured pink, appear in some accounts as British images, but they also figure in the history of other social formations—'Indian photography' or 'photography in Burma.'

Accounts of origin are also notoriously problematic and photography provides no exception. One place to start is with the fact that some people were looking for a cheap and reliable copying technique in the later eighteenth century. In 1802 Thomas Wedgwood and Humphrey Davy published a paper in the *Journal of the Royal Institution* giving details of how to copy existing images on paper, or pale leather, treated with silver nitrate. The veracity of these early experiments is open to dispute, but Wedgwood and Davy probably produced images that they were unable to 'fix.' Following Arago's announcement of Daguerre's process in 1839, William Henry Fox Talbot came forward to contest priority of invention, having independently discovered 'light drawn pictures.' Talbot, a landed gentleman with interests in mathematics, ancient languages and other things, wrote in the introduction to *The Pencil of Nature*, that in:

> …1833, I was amusing myself on the lovely shores of the Lake Como, in Italy, taking sketches with Wollaston's Camera Lucida, or rather I should say, attempting to take them: but with the smallest possible amount of success.

Dismayed by the transitory nature of the 'natural images' he saw with the aid of the camera lucida and the camera obscura, he claims to have considered ways of rendering permanent the fleeting scenes. On returning to Lacock Abbey he began experimenting with pictures made with light sensitive chemicals. In this account, photography emerged from the gentlemanly aesthetic of the picturesque (a proviso is that the landed class was not somehow outside capitalist social relations). However, there is a contradiction here because his first public showing of his photogenic drawings at the 1839 British Association for the Advancement of Science meeting in Birmingham was dominated by copies of lace, prints and textiles. From the beginning, Talbot may have imagined photography as a reproductive technology.

Talbot called the images he made from 1833 'photogenic drawings.' In 1835, he realised that the process could be repeated, using this first image as a "negative" for generating a "positive" print. (The terms 'negative' and 'positive' where suggested by Sir John Herschel, who is also usually credited with the term 'photography'). At this stage, Talbot's negatives were insufficiently dense to produce strong positives. In 1840 he discovered a second process, which he called the calotype (from the Greek word *kalos* for beautiful and useful). Also sometimes called 'Talbotypes' in honour of their creator, calotypes gave a latent image after a few seconds exposure, creating a negative strong enough to print from.

Photography in the 1840s was slow and required good light. However, the main restrictions on its development were legal rather than technical. In exchange for a pension from the French state, Daguerre allowed free use of his process—except in the lucrative British market. He sold the right to licence his process in England, Wales and the colonies to the coal merchant Richard Beard, who opened the first commercial photographic portrait establishment in Britain. Beard is sometimes represented as a pioneer photographer, but he was a proprietor and employed Jabez Hogg as his 'operator.' Professional licenses were expensive and Beard sold very few. Antoine Claudet, a Frenchman based in London, obtained a separate licence from Daguerre and also opened a commercial studio. In 1841 Talbot sought and was granted a patent on the calotype process, which he further extended in 1843. The result was that licences were required for paper photography too.

Nevertheless, during the 1840s the first tentative employments of photography began. Talbot had an eye on the mass image market**.** In 1843 he founded an establishment in Reading, run by his manservant Nicholas Henneman, to print negatives and produce books as well as teach photography. In 1844 Talbot issued the first part of *The Pencil of Nature*; printed at Reading it was arguably the first photographically-illustrated book. Produced in six parts, between 1844 and 1846, the twenty-four calotypes are a mix of picturesque views, botanical specimens, facsimiles of documents, reproductions of art works, and records of possessions. *The Pencil of Nature* was probably a demonstration album anticipating uses for the new process. In 1847, he opened the Sun Picture Rooms in Regent Street, London to make portraits and topographic and picturesque views. Talbot also entered a venture to establish the French *Société Calotype* for the commercial production of paper photographs; later, in 1852, he patented photoglyphic engraving, a method for producing photographic engravings on steel plates (he had intended to establish a factory to manufacture these images, until ill health intervened).

In the early years three groups were concerned with photography. Firstly, there were a small number of licensed commercial portraitists including Claudet.. Henry Collen obtained a licence from Talbot in 1841 to make calotype portraits, but had little commercial success and folded in 1844; Claudet then took over (he also proved unsuccessful). At Talbot's instigation, Henneman briefly established a calotype studio in London, before running the Sun Picture Rooms. Despite its fragile character and the single image that resulted, the daguerreotype was favoured for commercial portraiture, partly because it proved practicable before Talbot's process, partly for its incredible detail. Portrait work rapidly assumed a routine appearance, drawing on stock poses and settings from conventional painting. There were some exceptions to this rule, notably the partnership of David Octavius Hill and Robert Adamson, active in Edinburgh between 1843 and 1848. Hill was commissioned to create a large painting commemorating the founding of the Free Church of Scotland in 1843 and employed Adamson to make photographic studies of the churchmen. The resulting photographs are less formal than most contemporary portraits and the grain of calotype adds to the chiaroscuro effects. Hill and Adamson also made picturesque portraits of masons working on the Walter Scott memorial, soldiers and Newhaven fishing workers. Hill intended to market albums of pictures, but this came to little.

The second group were the men of science who were interested in photography as a chemical phenomenon and as a means to document nature. Talbot's account of photography posited images generated "without the aid of the artist's pencil." This 'objective' vision supposedly allowed things or phenomena to be recorded without the subjective intervention of artists. In this way, photography was significant in bolstering the emerging ideologies of science. This conception was extended by Sir David Brewster and Robert Hunt, who developed

the idea of the photographic record or document. Hunt made "nature prints" at this time, as did the amateur botanist Anna Atkins.

Thirdly, there were wealthy amateurs engaged in photography for their own amusement, though some also attempted to market pictures. Talbot's own circle was prominent in the early exploration of photography: Christopher Rice Mansell Talbot (a cousin), John Dillwyn Llewelyn (who married another cousin), Nevil Story-Maskelyne (Llewelyn's son-in-law), and their friend Reverend Calvert Richard Jones, all made picturesque calotypes. Particularly interested in the maritime scenes provided by the Welsh ports, Jones and Llwelyn intended to contribute 'Marine Talbotypes' to *The Pencil of Nature*. Jones sympathised with Talbot's attempts to exploit his invention commercially, and between 1845 and 1846 made calotype's in Italy and Malta marketed through the Sun Rooms. Work for Talbot's venture subsequently passed to the Reverend George Bridges who produced about 1,700 negatives in seven years, working in Italy, Greece, Egypt and the 'Holy Land.' Talbot lost interest and Bridges produced a prototype album: *Illustrations of the Acropolis of Athens*; and in 1858 published *Palestine as It Is*. In 1845, Talbot issued *Sun Pictures of Scotland*, comprising of twenty-three calotypes from subjects drawn from the life and writings of Scott. Photography in the 1840s was by no means restricted to this circle. Horation Ross, one time MP for Aberdeen, worked with both the daguerreotype and calotype, producing family portraits and sporting pictures. In 1847 a small group of interested photographers (including, Hunt, Frederick Scott Archer and Dr Diamond) established the Calotype Club; renamed the Photographic Club in 1848. This group provided the nucleus for the next phase of photography in Britain.

Photography received a significant boost from Archer's wet-collodion process, introduced in 1851. Glass-plate negatives where already in use, but collodion plates, exposed and processed while wet, were faster and gave quite fine detail. This process effectively killed the daguerreotype. Archer's process was represented by only one picture at the Great Exhibition of 1851. Ten years on, at the International Exhibition of 1862, photographs *not* made with collodion were singled out.

In the early 1850s Talbot engaged in a series of legal defences of his patent. In 1852 he obtained an injunction to restrain Richard Colls from trading without a licence and in 1854 the court upheld Talbot's claim against John Henderson who was "restrained under penalty of five thousand pounds" from selling calotype portraits. The same year he was also involved in the celebrated lawsuit of Talbot v. Laroche. This case was so significant because it tested Talbot's claim that Archer's process was covered by his patents. The court reasserted Talbot's calotype patent, but rejected any claim over Archer's process. Effectively, this ended Talbot's legal restriction and he subsequently allowed his patents to lapse. It has been estimated that Talbot recovered less than half of the £5,000 he spent on photography, but at a time when opposition to patents was central to liberal political economy, his reputation suffered considerably. In contrast, Archer did not patent his process and was acclaimed for his decision.

In response to photographic display at the Great Exhibition some suggested that English photographers had slipped behind the French. This argument gave impetus to the development of photographic societies and specialist journals. The first society appeared in Leeds in 1852, whereas the Photographic Society came into being in London in 1853. Initiated by Fenton and Claudet, it held regular meetings, discussed papers; from 1854 an annual exhibition was mounted. The society's periodical—*Journal of the Photographic Society of London* (subsequently the *Photographic Journal*)—appeared in 1853. Also in 1853 Queen Victoria and Prince Albert became the patrons (the title of Royal Photographic Society being adopted in 1894).

Societies spread rapidly throughout mainland cities and further a field. The Liverpool Photographic Society was established in 1853; Dublin in 1854, Manchester in 1855 and the Photographic Society of Scotland founded in Edinburgh in 1856. In the mid-1850s there were three societies in India. Many of these societies published proceedings and occasional papers in the *Journal of the Photographic Society*; some of them also organised exhibitions. In 1874 the Photographic Society was renamed the Photographic Society of Great Britain in recognition of its umbrella role. Two other journals of note emerged during this period: *The British Journal of Photography* was launched in 1860, but had existed under various names since 1854; and *The Photographic News* was founded in 1858, running until 1908. From the 1860s these groupings and their publications provided the armature for professional photography, however, they initially represented mixed interests. The early years of the Society saw tensions between amateurs, who favoured a gentlemanly organisation unsullied by trade, and those engaged in commercial photography. Fenton was in the later camp. Grace Seiberling argues that this wrangle dragged on until 1858 (Sieberling, 73).

The exchange clubs in the Society—the "Photographic Society Club" (established 1856), and the "Exchange Club of the Photographic Society" (sometimes called the "Photographic Club")—were probably vehicles for amateur hegemony. According to Seiberling, no more than forty people were involved in these clubs and the related the Photographic Exchange Club (9–10). The work produced was shaped by antiquarian-amateur interests with picturesque landscapes featuring dilapi-

dated rural buildings or ancient ruins occupying pride of place. Benjamin Brecknell Turner produced picturesque calotypes of English scenes throughout the 1850s; Llewelyn continued making picturesque views of Wales; Diamond, Edward Kater, George Shadboldt and others worked in this mode. Not all picturesque photography was conducted by amateurs: Edward Fox—"Landscape and Architectural Photographer"—worked in Brighton and Sussex; James Mudd, a portrait and industrial photographer, had a sideline in picturesque scenes of the Lake District. In the late 1850s Francis Bedford made an extensive record of picturesque Britain; Fenton was also particularly active in producing picturesque and topographical photographs throughout the mainland. Even during this period the hegemony of amateurs was incomplete. Commercial portraitists were involved in the Society and Fenton's Crimean war pictures of 1855, or Frith's tours of Egypt and the Holy Land, from 1856, were commercial speculations. In 1853 prominent early 'amateurs' founded the Photographic Institution, trading in photographic equipment, selling photographs and charging for lessons; Fenton and others temporarily left the Society to found the (unsuccessful) commercial Photographic Institution in 1856. Robert Howlett, one of the Institution's partners, documented the making of the Great Eastern steam ship in 1857. Unusual in capturing the industrial transformation of Britain, nine engravings from this series of pictures were published in *The Illustrated Times* in 1858. Philip Delamotte was one who made the successful transition from amateur to professional photographer, producing among other things, pictures of the rebuilding of the Crystal Place in Sydenham. By the later 1850s the trade in views—British and foreign—had become a viable business. In 1859 Frith opened an establishment to produce albumen prints, which expanded to become an extensive photographic emporium (in 1862 he purchased Fenton's archive). George Washington Wilson also ran a significant studio trading in Scottish scenes, producing an estimated 400 prints a day. While he continued to issue picturesque Scottish subjects, his business developed into a merchant house distributing views.

However, during this period the predominant accounts of photographic pictures did not come from professional photographers. Sir William J. Newton, Elizabeth Eastlake and William Lake Price who all tried to account for the new image were artists or, in Eastlake's case, closely associated with Fine Art; they rejected the idea of "art-photography." In the first issue of the *Journal of the Photographic Society* Newton argued that photographs were more 'artistic' when taken a little out of focus, he had in mind studies for artists, not independent photographic pictures. Subsequently, a debate raged on this subject with the men of science advocating optical sharpness while artists supported Newton: neither side imagined they were addressing artworks. In her much cited 1857 review of photography and political economy, Eastlake championed, what she called Newton's "heresy." She insisted that photography was not a fine art, but a "new medium" that could serve artists. Price's essays "On Composition and Chiaroscuro," which appeared in 1860, were among the most significant assessments of photography during this period. His account drew on the ideas of Academic artists like Reynolds, while refusing to sanction the photograph as independent artwork. The Academic tradition stressed idealisation and the importance of following artistic rules, rather than imitating nature's particularities. While he was certainly not alone, Price played an important role in introducing the antimonies of the Academic tradition into photographic discourse: hands and minds, mechanical and liberal, workers/slaves/servants and gentlemen, details and broad effects and low and high genres. Copies and copyists were 'base,' 'servile,' and 'mechanical.' He believed photographers must impose their intellect on the subject, rather than imitate it. This account cast a long shadow over the medium.

Photography really developed as a significant profession when the *carte-de-visite* arrived from France. Cartes probably appeared during the mid-1850s, but the carte craze dates from 1859. There were a mere 66 photographic firms in London in 1855; by 1864 this number had shot up to 284. Proportional increases are seen in most major cities. Estimates vary, but one suggests that between 1861 and 1867 some 300 to 400 million cartes were sold in Britain (Darrah, 4). Carte portraits usually sold at half a crown a dozen, and while the format resulted in virtually interchangeable images they extended portraits to the middle class. The carte trade operated in very different 'economies.' Camille Silvy, Oliver Sarony, J.J.E. Mayall and Williams catered to the luxury trade. Operating from lavish studies, they employed a range of assistants: receptionists, printers, colourists, even an operator who took the photograph. It was a mark of Silvy's distinction that he arranged poses and operated the camera. Nevertheless, his establishment was a portrait factory employing 50 people; Andrew Wynter suggested that by 1862 Silvy had produced 700,000 carte portraits (Wynter, 173). However, the main body of photographers were petit-bourgeois traders who owned some capital, but worked in the business, sometimes alongside family members and perhaps an assistant. Then there were the "cheap workers" who scandalised the champions of photography. The photographic press was full of stories of "photographic dens" employing "touts" in Bermondsey, Cheapside, the New-Cut, and Whitechapel. The pictures made in these studios could be rudimentary.

In addition, celebrity cartes featuring Royalty, clergymen, politicians and actresses became a lucrative

business. George Bishop, manager of the carte wholesale-company Marion & Co., claimed by 1862 they were monthly printing 50,000 cartes ('Mason v. Heath,'116). These merchant houses, and large companies like the London Stereoscopic Company, were not universally applauded. Stephen Thompson complained of "tradesmen or capitalists" who "hold much the same position in the trade with regard to their *employees* as what are termed 'sweating houses' do in the slop-trade. Everyone is under-paid and over-worked on the one hand, and the public over-charged on the other, and thus profits are made at both ends." (Thompson, 'The Commercial Aspects of Photography,'407). The large concerns increasingly drew smaller studios under their control. The corollary of success with celebrity portraits was the growth of 'photographic piracy'—the illegal copying of pictures. One report recorded wholesalers possessing between 500 and 700 illegal images: it claimed one dealer held a stock of 100,000 (Anon., 'Photographic Piracy,'566–7). Although this issue was not clearly resolved, the Copyright Act was extended to photography in 1862, largely to protect producers of celebrity cartes.

The rise of professional photography was important for the aesthetics of the medium that developed in the 1860s. The central event in this transformation was the International Exhibition of 1862. In 1861 commissioners for the exhibition announced their plan, categorising photography with machinery. In a long running dispute, the Photographic Society mounted a campaign to see their worked reclassified as Fine Art. Eventually, a compromise was struck and photography appeared in a "separate apartment" within the Machinery Court. This was a pivotal moment because for the first time a significant number of photographers began to view their work as a Fine Art.

The development of professional photography provides the context for the aesthetics of photography. This was an aesthetic of distinction designed to assert the respectability of photographers. During this period important figures like Alfred H. Wall and Henry Peach Robinson built on Price's ideas, but claimed that photography now constituted a Fine Art. These men retained central categories from Academic theory, but in line with wider trends in English art, they suggested that photography was best suited to pictures in the lower genres: portraiture, picturesque landscapes and moralised genre scenes in the tradition of Wilkie and Hogarth; they also emphasised the importance of nature. The pictures that resulted took three forms, all typified by a distance from the copy or document. Firstly, there were genre scenes, sometimes made with allegorical intent, sometimes depictions of "everyday life." Price, Robinson, Rejlander and Cameron all worked in this vein; which could take the form of posed tableaux or 'combination prints' (pictures assembled from multiple negatives): examples of the latter include Rejlander's *The Two Ways of Life* (1857) and Robinson's *Bringing Home the May* (1862). The extensive labour involved and the reliance on accepted subjects and compositional arrangements emphasised the role of the photographer. Combination prints met with a mixed reception and the tableau gradually assumed precedence. Secondly, the picturesque landscape tradition provided a great deal of scope for photographers, because it combined attention to nature with formal rules. The trick was to demonstrate taste in finding suitable arrangements. Robinson's *Pictorial Photography* is an important statement of this trend and he, along with Mudd and many others, worked in this tradition. Thirdly, there were tasteful portraits, often made by the elite studios, which placed a premium on poses, arrangements and backgrounds derived from painting. To some extent, Cameron broke with the established consensus by employing a "soft" focus equally across the picture.

While British colonial photography was not restricted to India, the 'jewel in the crown' occupied a central place in the Imperial imagination. Many photographers working in the sub-continent from the 1850s were army officers or employees of the British East India Company, or both. From 1853, John Murray, a Scottish army doctor and employee of the Company, focused on exotic and picturesque subjects; his pictures were distributed by the Dehli School of Industrial Art and *Picturesque Views in the Northwestern Provinces of India* appeared in 1858. Linnaeus Tripe, an army captain, published 300 views of Burma and under commission for the Company recorded objects of interest to antiquarians and architects as well as documenting the 'races' in the southern provinces of India. In 1862 Samuel Bourne visited the 'Holy Land' and was allowed to photograph previously restricted sites. In 1863 he travelled to India to work as a professional photographer producing 800–900 negatives; in the mid-1860s he made three tours of the Himalayas, resulting in images, which Haworth-Booth characterised as 'imperial picturesque' (104). The Bombay government employed a number of army officers to photographic ancient sculptures and inscriptions. Among the most ambitious colonial photographic projects was *The People of India*, edited by Dr. John Forbes Watson and Sir John William Kaye, which appeared between 1868 and 1875. This government-authorised pseudo-scientific study of "the Races and Tribes of Hindustan" contained 468 albumen prints by fifteen photographers. From about 1870 a booming trade developed in Indian views, to which some indigenous Indian photographers such as Lala Deen Dayal contributed. After a British military invasion in 1840, China surrendered Hong Kong and subsequently opened coastal cities to colonial adventurers: photographers followed in their wake. Felice Beato worked for the army

producing images of military positions, temples and palaces. He also worked in Japan and issued the albums *Photographic Views of Japan* and *Native Types of Japan* in 1868; John Thompson photographed in Malaysia and Indochina, Cambodia, Hong Kong and China from the mid-1860s. His *The Antiquities of Cambodia* appeared in 1867 and *Illustrations of China and its People* was published in 1877/78.

The carte trade was hit by a crisis of profitability in 1863/64 and never regained its previous giddy heights. While the portrait business was precarious, some studios thrived and expanded. During the 1870s W. & D. Downey and A. & G. Taylor developed businesses with multiple branches selling through a club system on credit, causing further anxiety to the smaller 'respectable' proprietors. Cameron, Robinson and others continued to make exhibition pictures, but on the whole the 1870s saw a lull in art activity. The development of the gelatine bromide dry plate by Dr Richard Leach Madox in 1871 facilitated outdoor work and photography in difficult spaces. Dry plates could be prepared in advance and developed much later; they were also more sensitive than collodion negatives. By the end of the decade their use was widespread. In 1873 Walter B. Woodbury introduced a form of photographic engraving—the Woodburytype—which contributed to the wider dissemination of images.

The key change during this decade was the increased role photography played in state and private institutions of social investigation and regulation. In the early 1870s experiments were conducted with penal photography; photography also came to play an important role in anthropology and colonial administration. During the later 1860s and 1870s photographers also turned their cameras on the poor and the working class. Along with other social investigators—journalists, urban missionaries and social reformers—they voyaged into 'unexplored' urban slums, often drawing on colonial imagery. Thomas Annan was hired by Glasgow City Improvement Trust to document slum conditions in some of the city's courtyards and alleyways, prior to their demolition. He produced thirty-one albums for the City Council. In 1878-9 a small edition of these prints appeared as *Photographs of Old Closes, Streets, Etc*. Perhaps the best known of all these projects was John Thompson's *Street Life in London*, which appeared in twelve parts between 1877 and 1878 and was subsequently issued as a book. Thompson's work was distinctive because each of the thirty-seven Woodburytypes focused on one individual engaged in some aspect of the metropolitan street economy. Each plate was accompanied by a commentary written by Adolphe Smith. This individuation amplified the evidential mode of investigators like Henry Mayhew and provided a central feature of subsequent documentary. "Street life" was often depicted through the filter of the urban picturesque, rendering dilapidation and ruinous dwelling conditions fascinating yet safe for middle-class viewers. The Society for Photographing Relics of Old London was founded 1875 to combat the proposed demolition of a sixteenth-century coaching inn. Henry Dixon and Alfred and John Bool were commissioned to record this building and many others. In 1868 Archibald Burns published fifteen albumen prints in his *Picturesque Bits of Old Edinburgh*.

We have a good picture of the top end of the trade during the first half of the 1880s due to H. Baden Pritchard's surveys. In this period photography became a large, concentrated industry. The Autotype printing works employed 80 people and daily processed 1,000s of feet of carbon tissue; A & G Taylor employed between 500 and 600 workers (their Forest Hill establishment printed for scores of regional branches). In the early 1880s, in addition to their Liverpool base, Brown, Barnes & Bell conducted two London studios and twelve regional ones. The provincial branches sent their work to Liverpool for printing: Pritchard reports that every day 2,000 impressions ran through the toning bath. The Woodbury Permanent Printing Company produced extensive runs of pictures for parliamentary candidates and Royal weddings. Allegedly, anything with a print run of less than 100,000 was not worthwhile. James Valentine and Son of Dundee, the largest Scottish studio, employed forty workers and made 3,000 prints a day. Alexander Bassano, Valentine Blanchard, William England, Hughes, Mayall, Robinson and Sarony all conducted grand studios in London and fashionable towns. Of course, there were still plenty of studios trading in cheap work.

By this point photography was embedded in a wide range of social institutions. It was, for instance, an important plank in the penal system. Prisons increasingly included studios on the premises; the practice was regulated by formal rules and an archive was established at Pentonville Prison, centralising photographs of all British prisoners. Francis Galton also developed his pseudo-scientific composite portraits which claimed to reveal the underlying characteristics of the 'criminal type.' According to Pritchard, by the mid-1880s photography was employed by astronomers, meteorologists, surgeons, physicians, geologists, chemists, physicists and botanists. (Pritchard, *Photography and Photographers*, 83) By the middle of the 1880s, the half-tone printing process was capable of reproducing photographs and combining them with type, although it was not until the 20th century that publications routinely featured photographs.

The last twenty years of the century saw a range of technical innovations that lead to capturing motion and more casual compositions: these included faster lenses and shutters and materials tolerant to flash powder. However, the most fundamental change occurred when

George Eastman introduced the Kodak camera in 1888. Rather than a technical innovation, Eastman's revolution turned on a marketing and business reorganisation typical of monopoly capitalism. The Kodak was a small box camera without a viewfinder, which came pre-loaded with celluloid roll film. When the roll was finished the camera was sent to Eastman's company, who processed the film and returned the prints complete with a newly loaded Kodak. As *The Kodak Primer* made clear the effect was to: "furnish anybody, man, woman or child, who has sufficient intelligence to point a box straight and press a button" the means of making photographs without "exceptional facilities or, in fact, any special knowledge of the art" (Coe, *George Eastman and the Early Photographers*, 67). Professional studios lingered on, but Eastman's system decisively shifted photography onto the terrain of the new mass amateur. This new amateur photography took off because it dovetailed with wider social changes, including, for some, increased leisure time and an improved standard of living. In the early years of photography amateurs had been wealthy gentleman, but the new amateur was a lower middle-class hobbyist with a little free time and some spare cash. Small folding cameras also became increasingly popular during 1890s. The result was a wider range of subjects and an increasing casualness in framing and composition. The people who made these images were primarily interested in recording rights of passage and fun moments and were largely unconcerned with the 'rules of art.' Paul Martin's pictures of high days and holidays, made after 1892 with a hand-held camera, are probably the best know.

The rise of the mass amateur and the preoccupation of the Photographic Society with representing a range of interests lead to a number of photographers committed to art increasingly taking a separate path. In 1885 P.H. Emerson, with Captain Abney, George Davison and others, founded the Camera Club of London as a forum for 'serious' amateur photography (in the earlier sense of 'amateur'). After meeting the painter Thomas Frank Goodall, Emerson became committed to 'Naturalism,' a supposedly truthful depiction of nature that emphasised rural labour. He also employed a selective focus, which he believed was closer to actual perception. Emerson's photographs typically consist of formally composed genre subjects from rural Norfolk; important examples appeared as platinum prints in *Life and Landscape of the Norfolk Broads* (1885). His influential manifesto *Naturalistic Photography for Students of the Art*, was published in 1889. Frank Meadow Sutcliffe worked in a less self-consciously artistic mode photographing Whitby, but related concerns are visible in his pictures.

In the middle of the 1880s W. Jerome Harrison established a number of photographic surveys of rural Warwickshire with the aim of recording old buildings as well as declining folk traditions. The photographic survey movement rapidly spread and Harrison, in collaboration with the industrialist Benjamin Stone, attempted to establish a national organization. However, Harrison's strident challenge to the photographic establishment proved his undoing, and Stone—who had become Tory M.P. for Birmingham—set up the National Photographic Record Association in 1897, which generated thousands of images of rural Britain. The international movement known as Pictorialism, which developed in the final decade of the century was, in the main, equally anti-urban in orientation, though it followed a different aesthetic path to either Emerson or the surveyists. In the wake of the Vienna Camera Club exhibition of 1891, a number of photo-associations split from the established societies. The Linked Ring Brotherhood broke from the Photographic Society in 1892, conducting a single-minded campaign for Pictorialist or artistic photography. This organisation restricted numbers, members, who had to be elected, never exceeding seventy five. Key figures include: Robinson, James Craig Annan, George Davison, Frederick H. Evans and two Americans domiciled in England—F. Holland Day and Alvin Langdon Coburn.

Pictorialism developed existing aesthetic concerns, but these photographers chose to pursue art-photography with vitality. Adopting conventional subjects and compositional modes from the existing pictorial arts, Pictorialists often gravitated to specialist photographing printing techniques that gave their images the appearance of drawings in ink or chalk and etchings. They tended to do extensive work on negative and print, giving the final image a unique and handcrafted appearance; they adopted a soft-focus approach and worked to suppress detail. Some were wealthy amateurs; others were professionals with a sideline in exhibition pictures; yet others still occupied a specialist niche in the amateur leisure market for photographic commodities, but their work entailed a common strategy of distinction, separating its proponents from 'mere' hobbyists. *Amateur Photographer,* a journal promoting a softer version of this Symbolist aesthetic, appeared between 1884 and 1918. The ethos of Pictorialism dominated photography until the rise of photo-journalism and modernism after WWI, but it survived much longer as a camera-club aesthetic; arguably, it still does.

STEVE EDWARDS

See also: Wedgwood, Thomas; Davy, Sir Humphry; Daguerre, Louis-Jacques-Mandé; Daguerreotype; Talbot, William Henry Fox; *Pencil of Nature;* Herschel, Sir John Frederick William; Calotype and Talbotype; Daguerre, Louis-Jacques-Mandé; Beard, Richard; Hogg, Jabez; Claudet, Antoine-François-Jean; Henneman, Nicolaas; Hill, David Octavius,

and Robert Adamson; Hunt, Robert; Brewster, Sir David; Atkins, Anna; Llewelyn, John Dillwyn; Jones, Calvert Richard; *Photographic Exchange Club and Photographic Society Club, London;* Prince Victoria, Queen and Albert, Prince Consort; Fenton, Roger; Rigby, Lady Elizabeth Eastlake; London Stereoscopic Company; Robinson, Henry Peach; Rejlander, Oscar Gustav; Tripe, Linnaeus; Cartes-de-Visite; Woodbury, Walter Bentley; England, William; Eastman; Kodak; and Brotherhood of the Linked Ring.

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GREAT EXHIBITION OF THE WORKS OF INDUSTRY OF ALL NATIONS, CRYSTAL PALACE, HYDE PARK (1851)

The Great Exhibition of the works of Industry of All Nations (the Great Exhibition) continued the series of the exhibitions of the products of the industry introduced in France to the end of the eighteenth century; those presented in Paris in 1844 and 1849 were the first great official demonstrations where one could see specimens of the new medium (daguerreotypes and photographs on paper). The first World Fair, organized by Prince Albert, opened in London from May 1 to October 11, 1851; it accommodated 17,000 exhibitors and 94 nations. This demonstration began a period of prosperity and economic stability after the political and social turbulences of the 1840s. If the previous decade had seen the birth and the rise of photography, the 1850s saw the processes diversify then and industrialize themselves. The new medium was used as much to emphasize the richness of two powers in full colonial expansion, the Victorian reign in England and the Second Empire in

France, as to restore the effigies of the newly triumphing middle-class.

The exhibition was presented in the 'Crystal Palace' built by Joseph Paxton, a palace of glass and cast iron, which was noted in the history of architecture for its vast metal structure which made it comparable to a greenhouse. Large workshops were built in the following years in the centers of London or Paris, the light entered in abundance; it made it possible to capture interior scenes, as a very beautiful daguerreotype of the Baron Gros (Paris, BNF) attests, which showed a part of the exhibition and made it possible to have an idea of the interior space and the arrangement of the objects and decoration. The effect of transparency and space was not the only contribution to the idea of the erasure of hierarchy among the exhibited products.

The Great Exhibition excluded painting; sculpture, engraving, and architecture were allowed there because of the roles they had in industrial creation. Photography did not constitute a section in itself: it was included in class X (instruments, clock making, surgical, musical, philosophical), and in the department of the "machines and instruments," in a relatively narrow space. One could also see photographs from various sections of the country. Three photographers had the honor of the court of the fine arts: Thomas Craddock, David Octavius Hill, and Samuel Buckle. It was the first great exhibition of photography on the international scale, opened in a fertile period in inventions (collodion by Scott Archer, stereoscopy by Brewster, on the English side) and in photographic foundations of all kinds (société heliographique, Blanquart-Evrard printing works, Missions heliographique, newspaper *La Lumière*, on the French side); *La Lumière* published two reports on the Great exhibition, one of which was signed Jules Ziegler, painter, photographer, and critic of art.

Approximately 770 photographic images were presented by six countries. Those shown might have seemed weak compared to what was then being produced in the rest of the photographic world, but only major studios, manufacturers, or photographers could take part because of the very high cost of transportation and insurance and of the risks of losses or accident during the voyage; moreover, the foreign participants needed an agent on the spot. In fact, three nations provided most of the exhibited works: England, the United States, and France. The three others were Germany, represented by William Albert and Frederic Strauch, both of Frankfort am Main (the first exposed reproductions of objets d'art); Austria was represented by Paul Pretsch, with views of Vienna, of Schoenbrunn, and reproductions of sculptures; Italy was represented by F and G Vogel, of Milan, with portraits based on paper negative.

All the techniques practiced since 1839 were shown; the two dominant processes were the daguerreotype and the paper negative, for which it was necessary to add negative glass to albumen. Wet collodion negative, developed at that point by Scott Archer in 1849, was introduced in 1851, the year of the exhibition; for this reason, it was hardly present (whereas in 1855, in Paris, collodion dominated the whole of the exhibited works). The daguerreotype was still well represented, especially by the Americans, who were honored by the panel: portraits by Brady, portraits by Meade, a Sight of the moon by Whipple, a Panorama of Cincinnati by Fontayne and Porter. Jules Ziegler criticized the presentation of the American daguerreotypes, which were placed under a platform that darkened the room considerably and accentuated the mirror effect of the plates, which made viewing difficult. The English Martin Laroche and John Mayall showed, on daguerreotypes, reproductions of sculptures. The French daguerreotypists included Amédée Thierry, of Lyon (self-portrait, scene of Lyon), Vaillat, Sabatier, Victor Plumier. Others who exhibited little afterwards are less known today: the manufacturer Christofle (a daguerreotype), A. Gouin (ten portraits with the daguerreotype including eight colored), Maucomble, present in Paris in 1844 (five portraits with the daguerreotype). The Schiertz manufacturer sent apparatuses. The technique of the stereoscopy, published a few months earlier by David Brewster, its inventor, constituted one of the innovations of the exhibition; Queen Victoria was fascinated by the stereoscope and Brewster sent one to her only a few days later, built in Paris by Duboscq. The photographers Claudet and Mayall showed stereoscopic daguerreotypes. French photography included work by several leading pioneers in early paper photography: Hippolyte Bayard (three frames containing 17 prints if the monuments of Paris and Rouen, of the reproductions of low-reliefs and statuettes, as well as "Gothic portraits" mentioned by Ziegler), Flacheron-Hayard, of the circle of photographers established in Rome (seven great sights of Rome), the Blanquart-Evrard printer (tallies of nine prints), Cousin (landscapes and portrait of woman), Gustave Le Gray (eighteen prints without precise details), Henri Le Secq (twelve shots of the cathedrals of Amiens, Chartres, Rheims). Frederic Martens exhibited a panoramic sight of a tower of Notre-Dame captured with the mégascope, a panoramic apparatus of his invention, and other prints obtained with the apparatus of Lerebours and Secrétan. Among the English, Antoine Claudet, a Frenchman located in London, who had appeared in the Parisian exhibition of 1844 with daguerreotypes and works on paper, showed portraits of the daguerreotype and various processes of his invention. The Scots David Octavius Hill and Robert Adamson were present with several frames containing of the scenes obtained on paper negative (Fishermen of the village of Newhaven, close to Edinburgh) as well as portraits. Hugh Owen of Bristol should be mentioned,

who photographed trees, Voigtlander with portraits, Ross and Thompson.

Photography also played an important part as a means of documenting the exhibition. In addition to individual initiatives like that of the baron Gros already mentioned, a report was made of the whole demonstration, and the photographs were used to illustrate the Reports of the Juries (each set of four volumes illustrated with 155 salt prints from calotype negatives). On the whole, 20,000 prints were made and mounted; it was the most important illustrated publication of photographs ever created, but not without difficulties. The photographers Nicolaas Hennemann, assistant of Talbot; Frederic Martens; and Claude-Marie Ferrier were in charge of the negatives, Hennemann specifically for salted prints and the two others for glass with albumen; Hennemann also made photographic prints based on paper negative of Owen (objets d'art applied). Jules Ziegler evoked the campaign sights made by Ferrier in London (seen external and interior of the exposure) in company of a Mulhousian patron of photography (undoubtedly Dollfuss-Hausset, Mulhousian industrialist and collector of photographs). Certain sights of the exposure per Antoine Claudet and John Mayall were sold to the visitors as souvenirs. Guides of the exhibition were also illustrated with engravings created based on photographs. Robert Hunt, man of science, member of the Royal Society, author of the first paper on photography in England (1841), and a member of the grouping usually referred to as the Calotype Club, published a summary review of the exhibited products of industry; he noticed the many collections of daguerreotypes there; calotypes of a remarkable beauty, in particular the pictures of forests; works on negative glass, and in particular portraits. The panel, anxious to encourage the development of the "applied arts to industry," in accordance with the general orientation of the exhibition, deplored the small number of scientific applications (archaeological copies of inscriptions, plants, animals, etc.) compared to the traditional kinds of the portrait and landscape.

In the context of economic and industrial emulation between the two principal nations of Europe, which had been also translated into the field of photography (simultaneous research on paper negative by Talbot and Bayard, then on negative glass), this demonstration offered an assessment of the work carried out since 1839. For the scientific community of the photographers, England had to acknowledge itself overcome in its own territory: technical subtleties and the obstacles imposed by Talbot on the distribution of his process (an obligation for any person using it to pay a royalty) limited the spread of the English calotype; whereas on the French side, the system of patents and the support of the government allowed the practice of photography to be much freer. Because of the small number of calotypes presented, English inferiority on the artistic level was all the more glaring. To rectify this situation, in October 1851, Roger Fenton went to Paris where he met Henri Le Secq, Gustave Le Gray, Charles Nègre, his former fellow-members of the studio, and Paul Delaroche at l'Ecole des beaux-arts; on his return, he wrote a report on his stay, in which he underlined the unifying role of the société heliographique and the newspaper *La Lumière*, the importance attached to printing works of quality, as well as the involvement of the French government. From this point of view, the exhibition of 1851 stirred the community of English photographers, who constituted themselves thereafter in companies. After a first exhibition entirely devoted to photography, accommodated by Society of Arts, during the winter 1852–1853, the Photographic Society of London, founded in January 1853, become the Royal Photographic Society, and organized an exhibition every year.

The exhibition of the Crystal Palace was a great public and economic success (six million visitors). Prince Albert decided to donate the profits created to the creation of an academy of arts and trades, an establishment intended to record the level of quality of industry connected with new aesthetic orientations. A plot was acquired in the district of South-Kensington, the museum of South-Kensington was established, and opened in 1856. At the end of the century it became the Victoria and Albert Museum; this museum, reserved for the applied arts, preserved photographs from the beginning and developed a photographic department of reproduction with the service of arts. Other measures were taken in the following years by the British government: creation of exhibitions, educational establishments of design, in order to familiarize the industrial class with the objets d'art. After the closing of the exhibition, the building was repurchased by the Crystal Palace Company, and was dismantled and reassembled in Sydenham, in the south of London, between August 1852 and 1854. The photographer Philip Henry Delamotte chronicled the construction through photography (a hundred pictures) on the rebuilding of the building (London, British Library); in 1855, he published it under the title *Photographic Views of the progress of the Crystal Palace, Sydenham*, and showed some of them at the Exposition Universelle, in Paris. Reopened in 1854, the Crystal Palace was destroyed in 1936 in a fire.

HELENE BOCARD

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GREAT EXHIBITION, NEW YORK (1853–1854)

The Exhibition of the Industry of All Nations took place in New York City from 14 July 1853 to 1 November 1854. It was the first international exhibition (or, loosely speaking, "world's fair") to take place in the United States. The exhibition has ever since been popularly known as the Crystal Palace Exhibition. The New York exhibition was directly modeled on the London Great Exhibition that took place in the Crystal Palace, Sir Joseph Paxton's monumental greenhouse-like edifice of glass and cast iron, in Hyde Park in 1851. In New York, the architects Georg Carstensen and Charles Gildemeister designed a variant on the Paxton building. (Exhibitions at this time typically took place within a single building. Later in the century Paris would pioneer the use of a campus of several buildings to house an exhibition.) The New York Crystal Palace comprised 1,800 tons of iron and 15,000 panes of glass, and its 123-foot-high dome was the highest that had been built in the United States. The exhibition building was located in what is now known as "midtown" Manhattan, but which in the 1850s was the northernmost settled area on Manhattan island. The precise location was Reservoir Square (now known as Bryant Park), to the immediate west of the Croton Distributing Reservoir in the block bounded by Fifth Avenue, 42nd Street, Sixth Avenue, and 40th Street. There were 4,390 exhibitors at the Crystal Palace, exhibiting industrial products, consumer goods, artworks, machines, carriages, scientific instruments, recent inventions, agricultural equipment, guns, fire engines, clocks, telegraph machines, ships and boats, minerals and metals, dry goods, and, not least, photographs and photographic equipment. With the opening in 1825 of the Erie Canal, New York had solidified its standing as the most important port city of the United States, as well as the country's most important financial, mercantile, commercial, and industrial center. Europeans had begun to say that New York was, or was destined to be, the "London of the New World." Seeking to show the city off to the world, New York businessmen, chiefly allied with the Chamber of Commerce of the State of New York, and other civic leaders organized the exhibition with the backing of the municipality.

The exhibition brought many visitors to New York City, and most New Yorkers attended the exhibition at least once. Both Mark Twain and Walt Whitman visited it, and both were suitably impressed; Whitman visited on many occasions. The tourist boom occasioned by the exhibition led to the construction of numerous hotels, several of them on an unprecedentedly grand scale. The national importance of the exhibition was underscored by the fact that President Franklin Pierce delivered a speech at the Crystal Palace on its opening day.

The exhibition coincided with the immense and sudden popularity of photography, especially daguerreotypy, in New York. The *New York Daily Times* of 29 March 1853 wrote of one exhibit that it was "arranged...in such a manner as to be a daguerreotype of the resources of every State in the Union." The metaphorical use of "daguerreotype" is a clear indication that photography had very rapidly worked its way into the collective consciousness of New Yorkers. Also, by 1853 popular New York magazine illustrations often were lithographs from daguerreotypes. The distinguished Putnam's magazine in that year presented a series called "New York Daguerreotyped," showing among other things images, destined to become iconic, of the Crystal Palace, a building that may have been among the first in America to be designed to be photogenic, and certainly one of the most extensively photographed new buildings in America to be constructed during the first two decades following the New York painter and inventor Samuel F.B. Morse's introduction of daguerreotypy to the United States.

The common usage of the new word "daguerreotype" underscores how in the fourteen years separating the exhbition from the introduction of daguerreotypy to America the medium had become so widely and wildly popular in the United States that historians have been hard pressed to explain the phenomenon. Morse introduced the daguerreotype to New York approximately one month after Louis Daguerre had first demonstrated his invention in Paris. From that point on, the United States took the lead in daguerreotype production and in the refinement of daguerreotype technique. This was amply evidenced in the New York Crystal Palace exhibition. Indeed, two years before the New York exhibition, Americans had won the majority of awards for daguerreotypy presented at the London Crystal Palace exhibition.

In discussing the Great Exhibition, *Scientific American* (20 August 1853) noted, "It is generally understood that the best daguerreotypes are produced in the United States: The fame of our operators is world-wide." About forty deguerreotypists exhibited at the New York Crystal Palace, and it appears they were all Americans. "Probably the best daguerreotypes in the world may be found here....There are good pictures by all the exhibitors, but the palm will be borne away by our New York artists."

In the number of the *Photographic Art-Journal* (June 1853) coinciding with the exhibition's opening, it was noted of New York that "The daguerrean galleries of this city are among the primary objects of interest to visitors,

and the collections here presented are incomparably superior to any to be found in a European metropolis, without exception." Whether this was true or not, it was generally understood by New Yorkers to be so, and the exhibition provided an outstanding venue for the city's and the country's self-celebration as a world center of photography.

Among the daguerreotypists exhibiting at the Crystal Palace were such well-known practitioners as Mathew B. Brady, Jeremiah Gurney, Alexander Hesler, Marcus Aurelius Root, and Gabriel Harrison, with lesser-known figures such as William C. North, Enoch Long, Anthony K. Zuky, John Adams Whipple (inventor of the "crayon daguerreotype"), and Samuel L. M. Meacham.

The Crystal Palace building was used for a variety of purposes following the closing of the exhibition. The building burned down in a spectacular blaze, itself the subject of many well-known photographs, on 5 October 1858.

Francis Morrone

See also: Brady, Mathew B.; Daguerreotype; Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); Gurney, Jeremiah; Harrison, Gabriel; Hesler, Alexander; Root, Marcus Aurelius.

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GREECE

Interest in traveling to Greece has a long history and, to judge from the ever-increasing number of visitors, the desire to see the country remained unaffected by the constant political social changes within Greece. Due to its geographical location the country served both as a place of transit for voyagers to the Holy Land and as a destination in itself. The country was photographed for the first time in October 1839, only two months after the official announcement of Daguerre's method at the French Académie des Sciences in Paris. The first daguerreotypes were taken by the Canadian Pierre Gustave Joly de Lotbinière (1798–1865) who was travelling across the Mediterranean on behalf of Noel Marie Paymal Lerebours. According to Lotbinière's diary he made a total of eleven daguerreotypes in Athens, but only three of these images—the Parthenon, the Propylea and the Temple of the Olympian Zeus—were included, as aquatints, in Lerebours's album entitled *Les Excursions Daguerriennes: Vues et Monuments les plus remarkables du globe.*

The oldest existing daguerreotypes of Greece belong to the French artist and historian of Islamic architecture Joseph-Philibert Girault de Prangey (1804–1892). Prangey visited the Greek capital during his travels in the Mediterranean and the Near East in 1842. He spent approximately five to six weeks photographing not only the classical monuments but also examples of early Byzantine architecture.

Photography was introduced to the Greek population by travellers visiting the country. Its was in 1846 when the French photographer Philibert Perraud taught the secrets of the new medium to the Greek painter Philippos Margaritis. The eleven daguerreotypes that survive testify that the two men worked together for a short period of time. In 1853, Margaritis opened the first professional photographic studio in Athens where members of the Royal Family and celebrities were photographed, earning him the title of the 'first Greek professional photographer.'

The non existence of talbotypes in Greece verifies the assumption that Greek photographers did not practice the calotype process. The pioneer calotypist to visit Greece was Reverend George Wilson Bridges who was travelling in the Mediterranean between the years 1846 and 1852. During his travels, Bridges made a total of 1700 negatives, sixty-six of which pictured Grecian antiquities. On his return to England in 1852, he had made plans for the publication of an illustrated folio entitled *The Illustrations of the Acropolis of Athens* and a supplement to it, containing 36 and 30 calotypes respectively. It appears that the album was never published.

The early 1850s was a period of further transition in terms of photographic technology. The calotype was replaced by the wet collodion process making photography more resistant to elements such as hot climates. Additionally, travellers became increasingly intrigued by the 'new discovery,' and the profession of photographer began to appear more attractive in commercial terms. Thus began a dynasty of photographers whose photographic views of the Grecian antiquities would

invade Europe in the form of souvenirs brought home by tourists. Prominent among them are James Robertson (1813–1888), Francis Frith (1822–1898) and Francis Bedford (1816–1894).

The serious economic and social problems that Greece faced during the 1850s did not restrict the practice of photography to the richer classes. However the number of professional Greek photographers remained relatively small. At the same time a new type of photographic production aroused. 19th Century photographic portraiture in Greece has often been characterised for its lack of artistic or aesthetic value. Individuality of any kind seems to be abolished by the expressionless faces of the sitters and the characteristic uniformity of their costumes. Among the few practitioners, the work of Dimitrios Constantinou, Athanasios Kalfas and Petros Moraites is distinguished.

Petros Moraites was born on the island of Tinos in the Aegean Sea. He studied painting in Athens but very soon, fascinated by the new medium, he became involved in photography. In 1859, in collaboration with the Greek photographer Athanasios Kalfas, he opened a studio in Athens. The very same year, the two partners presented photographs at the 1st Olympiad (held in Athens) winning a silver medal for their photographic reproductions of landscapes. Many important personalities of the Greek society: politicians, intellectuals, ambassadors, actors including members of the royal family, as well as ordinary people, posed before his camera. It is assumed that around 1868, he was appointed 'photographer to H.M. the King,' a title bestowed for the first time on a Greek photographer.

By 1875 photography in Greece was not restricted within the boundaries of the country's capital. Photographic studios were also found on islands such as Syros and Crete and in other cities such as Corinth and Patra. The Rhomaides Brothers (Konstantinos and Aristotelis) originally from Bucharest, opened a studio in Ioannina and subsequently settled in Patras. In 1875 they undertook the photographing of the excavations at Olympia carried out by the German Archaeological Institute. This collaboration led to their specialising in archaeological photography, which is why they were employed almost exclusively by most of the archaeological schools operating in Greece at that time. They established themselves in Athens in 1876 while retaining, at the same time, their studio in Patras. The Rhomaides Brothers also won fame as portrait photographers, recording for posterity many of the prominent people of their time. Well-known photographers, such as Ioannis Xanthakis and Antonis Milionis, received their training in their studio.

By 1891, there existed 27 photographic studios in Greece. Among them, the photographic work of Anastasios Gaziadis is of great interest since he was one of the very few Greek photographers of this period to photograph factories, buildings and products for industrial and advertising purposes.

Towards the end of the nineteenth century, and as photography became mass-produced, the iconographic interest began to change. 'Traditional' depictions of the antiquities were now dull and new ideas were explored. An interest in Greece's social environment and political life began to emerge; indeed, despite all the difficulties still involved in the photographing of moving subjects, photographers were now to be found at events of every kind. In addition, the Greek countryside and scenes of everyday life are also documented, thus demonstrating how photography can overcome its static and silent nature and befriend reality.

ALIKI TSIRGIALOU

See also: de Prangey, Joseph-Philibert Girault; Architecture; Calotype and Talbotype; Robertson, James; Frith, Francis; Bedford, Francis; Constantinou, Dimitrios; and Moraites, Petros.

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GREENE, JOHN BEASLY (1832–1856)

J.B. Greene (as he signed his work) was the first photographer active in the Middle East who was also a trained Egyptologist, and despite the handicaps of his youth and nationality, he achieved some recognition both fields during his lifetime. However, his early death resulted in almost immediate obscurity and Greene remained largely forgotten until the late 1970s, after his photographs were included in exhibitions for the first time since 1856 and vintage prints began to appear on the market. John Beasly Greene is now recognized as one of great masters of 19th century photography, admired for his distinctive and unique proto-modernist vision. Prime examples of Greene's work are rare and are avidly sought by museums and private collectors.

John Beasly Greene was born in Le Havre but was an American national by virtue of his father's citizenship. John Bulkley Greene (1780–1850), a native of Concord, New Hampshire, had been a resident of France since around 1814; at the time of his death he was the head of Greene & Co., the major American bank on the Continent, and a leading figure in American expatriate community in Paris. John Beasly Greene, his only son, inherited the status and the financial independence to devote himself to his joint avocations of photography and Egyptology. His teachers were preeminent in their fields: Gustave Le Gray taught him photography and the waxed paper process; Emmanuel, Vicomte de Rougé, Champollion's successor as head of the Egyptian Department of the Louvre, taught him hieroglyphics. No dilettante, Greene was inducted (as a foreign member) into the prestigious Société asiatique, the French archaeological society, in 1853, at the age of twenty-one; in 1854, he became one of the founding members of the Société française de photographie.

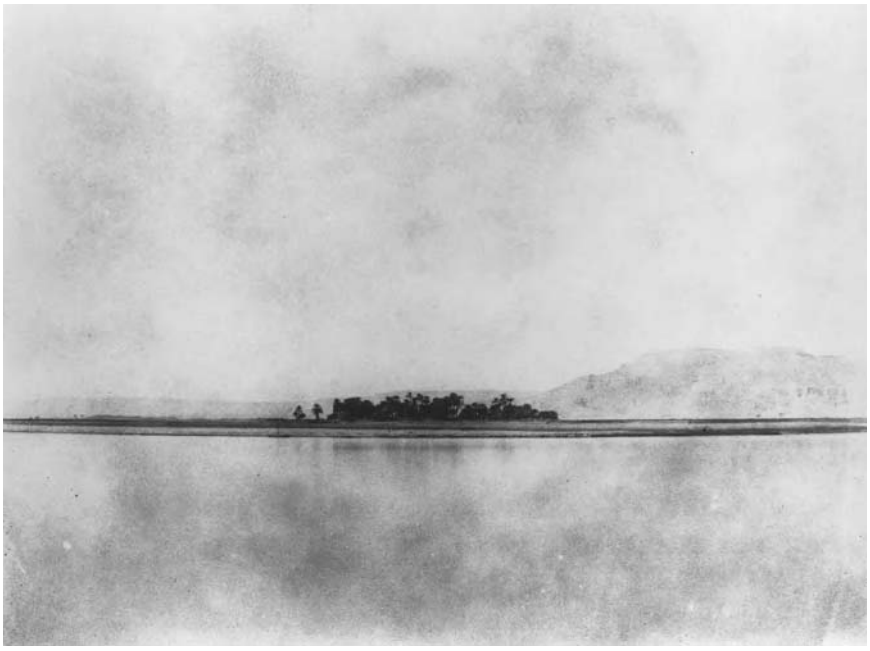
Greene completed two extended trips to Egypt in the course of his brief career. On the first, made during the winter season of 1853/54, he traveled up the Nile as far as the Second Cataract in Nubia, photographing the landscape, notable landmarks, and ancient Egyptian monuments along the route. Greene returned the following winter season (1854/55) with a *firman* (permit) to excavate at the Mortuary Temple of Ramses III at Medinet Habou at Thebes. Greene systematically photographed the progress of his excavation of the second courtyard of the Temple, the hieroglyphs that covered the walls of the courtyard, as well as architecture and details of the temple complex itself. The images of Medinet Habou include a remarkable series of views of the site taken from different points of the compass and at decreasing distances, in which the massive structures are so diminished by the vast scale of the empty landscape surrounding them that they look like miniatures .

Greene also made two trips to Algeria. In December 1855, he joined an official French expedition as official photographer for a two-part exploratory excavation of "Le Tombeau de la Chrétienne" (the Tomb of the Christian Woman), a 1st century BC burial mound near Tipasa, about 85 miles west of Algiers. He returned to France when the first phase of the excavation ended in early January 1856, but was back in Algeria in mid-February, six weeks prior to resumption of the excavations. It is probable that Greene used those six weeks to visit Constantine, an ancient city 200 miles northeast of Algiers, perched dramatically on a high plateau above—and half-encircled by—the deep gorge of the Rhumel River. The photographs he made of Constantine and the landscape surrounding it are among Greene's finest, most compelling images: tight, almost abstract compositions that seem charged with emotion and portent. When the excavations at the Tomb of the Christian Woman ended in early April, Greene sailed to France from the port city of Cherchelle, where he took his last photographs.

Greene made a third trip to Egypt in early November 1856. Already seriously ill when he arrived in Cairo, he died a few days later, the victim of an unidentified "cruel disease" (probably *not* tuberculosis). His death was announced at a meeting of the Société française de Photographie, and in the French, British, and American press. He was just 24 years old.

Greene's photographs are metaphors for his emotional response to Egypt rather than the more descriptive records produced by contemporaries such as Maxime du Camp or Leavitt Hunt. His Egyptian photographs are characterized by their emphasis on the emptiness and vastness of the Egyptian sky and landscape, which dominate most of the compositions and overwhelm the scale of even the most massive of the ancient monuments in most of Greene's images. His images reveal an extraordinary, proto-modernist eye, interested in the impact of graphic form, which distinguishes Greene from his contemporaries: his signature image, "Bank of the Nile, Thebes," consists of three simple elements—the dark straight line of the west bank of the Nile supporting the darker silhouette of a small oasis centered against the faint outline of the Theban Hills behind it—suspended between an area of slight tone at the bottom (the Nile) and blankness that fills the upper half of the frame (the sky)—is a composition unparalled in 19th century photography. Greene organized his Egyptian photographs into three series: "P" *(Paysages*, landscapes), "M" (*Monuments*, architectural monuments), and "I" (*Inscriptions*, hierogylphic inscriptions). The images in each series are numbered in geographical sequence, south to north, with the series number inscribed in the negative, usually in the lower left-hand corner. The images were also often signed "J.B. Greene" in the negative, usually in the lower right of the print. The highest recorded numbers for each series are M-42, I-108, and P-56, and each series includes photographs taken on both his trips to Egypt, in 1853–54 and 1854–55. There are also numerous Egyptian images that were not assigned a series number. The total body of Greene's Egyptian photographs numbers approximately 300 images.

Greene made no effort to organize his Algerian work, which consists of only about 40 images (including those documenting the excavation of Le Tombeau de la Chrétienne), all of which seem more personal and more purely pictorial than his Egyptian photographs. The photographs he made at Constantine, and particularly those taken in the Gorge of the Rhumel, seem so brooding and filled with portent that it is tempting to believe they are expressions of a premonition on Greene's part of his impending death, and what he intended to do with



Greene, John Beasley. The Nile. *The Metropolitan Museum of Art, Gilman Collection, Purchase, The Horace W. Goldsmith Foundation Gift, 2005 (2005.100.63) Image © The Metropolitan Museum of Art.*

them is not known. None of the existing Constantine photographs were ever mounted, none were given to any of the French institutions to which Greene had given his Egyptian photographs, and although four of these photographs are known to have been posthumously exhibited in Brussels in 1856, where they won an honorable mention, there is no other reference to them in contemporary literature.

Greene was clearly concerned from the beginning of his career with ensuring the preservation of his legacy. He donated important collections of his prints to the Institute de France, the Bibliothèque nationale, and the Société française de Photographie. He also announced that Goupil would publish a 60 print album of his Egyptian photographs and commissioned Blanquart-Evrard to make the prints, although album never materialized. (The album *Le Nil, Monuments, Paysages. Explorations Photographique par John B. Greene,* in the collection of the Société française de Photographie, which is *credited* to the "Imprimerie photographique de Blanquart-Evrard, a Lille, 1854" on its letterpress title page may be the dummy for the proposed Goupil publication.) Greene published a two part report on his excavations at Medinet Habou, *Fouilles exécutées à Thèbes dans l'année 1855,* illustrated with lithographs of hieroglyphic inscriptions copied from his photographs. An article in the *Bulletin Archéologique de l'Athenaeum Française* on a fragment of Egyptian sculpture he found and photographed in the museum at Cherchelle, Algeria, was his final professional effort.

The major holdings of John Beasly Greene's photographs are in the French institutions collections to which he gave the work, as well in as the Musée d'Orsay, which holds the definitive archive of Greene's Egyptian photographs, the comprehensive set of prints and negatives that had been deposited with Egyptian Department of the Louvre sometime after Greene's death by Théodule Devéria, the son of the lithographer who made the illustrations for *Fouilles exécutées à Thebes*, Greene's contemporary and probably a friend, and like Greene, a trained Egyptologist. Interestingly, apart from complete set photographs from the excavations at the Le Tombeau de la Chrétienne, none of Greene's Algerian photographs are in the French collections; the National Gallery of Canada owns the most extensive institutional collection of this material. The other important collections of Greene's photographs (both Egyptian and Algerian) are held by the Metropolitan Museum of Art and by the Museum of Modern Art, in New York; and in the J.Paul Getty Museum in Los Angeles.

The spelling "Beasley" that appears in almost every current reference is incorrect. The correct spelling is as given here, without the second "e." The authority for this is the family tomb in Père-Lachaise cemetery in Paris, which is the only place I have ever seen Greene's full name spelled out. (He usually signed his name as "J.B. Greene," sometimes as "John B. Greene.") The spelling with two "e"s originated, unfortunately, in a confused phone conversation I had with a prominent dealer in the earlym 1980s, shortly after I located the Greene tomb. The Greenes usually used either the mother's maiden name or a deceased first wife's maiden name as the middle names for a son. I have never been able to determine the name of John Bulkley Greene's wife (or wives), however, it is worth noting that one Reuben Beasley (also spelled Beasly in the records) was the American consul in LeHavre when J.B. Green was born there in 1832. John Bulkley Greene and Reuben

Beasley certainly knew one another; they may even have been close friends, and it is even possible that they were related by marriage (I would guess Greene to Beasley's daughter)—although that remains to be established. In any event, it seems very likely (if not probable) that John Beasly Greene was named after Reuben Beasley—though if this is indeed the case, the reason for the different spellings needs to be clarified.

WILL STAPP

See also: Blanquart; Du Camp, Maxime; Goupil & Cie; Le Gray, Gustave; Hunt, Leavitt and Baker, Nathan Flint; Société française de Photographie; and Waxed Paper Negative Processes.

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GREENLAW, COLONEL ALEXANDER (1818–1870)

English photographer

Alexander Greenlaw was born in London and, at the age of seventeen, joined the Madras Infantry as a cadet and was posted to Trichinopoly in Madras.

His interest in photography dates from before 1855, when he first exhibited photographs at an exhibition of art and industry in Madras.

He used both paper and glass negative processes, having exhibited images on both at exhibitions organised by the Photographic Society of Bombay, of which he was a 'corresponding member.'

In 1856 he produced an extensive series of large format, 16 × 18 and 16 × 20 inch, images on paper negative, many of which are still extant, depicting the ruins of the city of Vijayanagar in south-western India.

Despite his experience with collodion, Greenlaw's preferred method—which he used into the 1870s—was his own simplification of the calotype, which became known as 'Greenlaw's Process.' While collodion had long been the process of choice throughout most of the world, Greenlaw believed that a simple paper negative process was the most ideally suited to the Indian climate and conditions.

The earliest account of Greenlaw's Process was carried in *Photographic News* in January 1869, and extensive accounts of it were carried in the 8th edition of John Towler's book *The Silver Sunbeam* in 1873, and in the 7th edition of Abney's *Instruction in Photography* in 1886.

JOHN HANNAVY

GROLL, ANDREAS (1812–1872)

Austrian photographer

Andreas Groll was born on 30 November 1812 in Vienna as a son of a man servant. He might have come into close contact with photography as a consequence of his employment and as a lab assistant at the polytechnic institute (today the technical university) in Vienna from 1845 to 1853. At that time, the polytechnic institute was the most important place of early photography in Austria because of the employment of different professors (Johann Joseph of Prechtl, Anton of Schroetter, who promoted Groll personally) and particularly the activity of Anton George Martin. Groll busied himself at that time with the daguerreotype and salt paper and albumen, moving from paper to glass negatives. In addition, predominantly concerned with portraits and architecture photographs (Viennese step Hans cathedral) he developed, particularly interesting pictoral documents of monuments. In co-operation with Eduard von Sacken, Groll's first large special photographic work was to photograph historical weapons and arms in the imperial collections. Groll photographed locomotives of the K.K. and at about the same time was granted privilege to the Austrian state railway company (StEG) for the Exposition Universelle in Paris 1855. Comissioned by the StEG, between 1860 and 1865 he produced another *Album der Banater Besitzungen*, most originally in the combination of landscape and industrial photographs as well as images of employees and native groups of peoples at this oldest railroad line in what is Romania today. Groll's speciality remained photography of architecture. Subject matters were historical buildings in Vienna, Prague, Krakau, Kuttenberg and other places of the Austrian Kronlande. New churches and stations came into Vienna, which stood in connection with the large urban extension after 1857. Groll's photographs often appear remarkably careless and nearly roughly arranged.

MAREN GROENING

Biography

Andreas Groll was born on November 30, 1821 in Vienna as a son of servants Anna and Joseph Paul Groll. In 1845 he married Josepha Brenner and found in the same year (until 1853) a job as a lab assistant at the Viennese polytechnic institute where he had worked since 1844 with professor von Schroetter as an assistant. In 1857 he opened his first studio in Vienna. He had already seen success as a special photographer, awarded in 1855 at the Paris world exhibition. He also documented important architectural projects of the Viennese urban extension (Votivkirche, arsenal). In 1861 he became a member of the photographic society in Vienna, where in 1864 he showed an extensive spectrum of his past work in a large exhibition (including nine Daguerreotypes from 1843). In 1865 he appeared in a publisher's catalogue with 788 numbers. Groll died on 12 October 1872 of typhoid fever in Vienna.

See also: Austro-Hungarian empire, excluding Hungary; Societies, groups, institution, and exhibitions in Austria; and Industrial Photography.

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GROS, BARON JEAN BAPTISTE-LOUIS (1793–1870)

Baron Jean Baptiste-Louis Gros was born in Ivry-sur-Seine on February 9, 1793. His father was an employee of the Duchess of Bourbon. Little is known of his training, except that he traveled and practiced drawing and painting as an amateur. In 1823, he entered the diplomatic service as a free attache with the Legation of Lisbon. In 1828, he was sent to Egypt and received the title of baron the same year. A diplomatic missions then brought him to Mexico City, where in 1831 he was at the head of a diplomatic mission, then in Bogota, as chargé d' affaires, in 1838.

It is there that he took note of the invention of Daguerre and where he created his first daguerreotypes, probably, at the beginning of the 1840s. To do this he used the Chevalier lens, applied the bromine according to the technique recommended by Foucault, and resorted to the iodide box developed at that point by the baron Séguier. In 1841, he presented to the Academy of Science of Paris a way to reproduce colors but appeared unable to bring the least proof of its invention. Two daguerreotypes of Bogota created during this period are known today.

Shortly after, he returned to France, sometime between 1844 and 1847. His photographic activity continued in various fields: about 1845, he created astronomical pictures with Eugene Durieu, while making many architectural daguerreotypes of French monuments, many in Paris (the Pantheon, Our-injury, quays of the Seine) and in the province (Ste Croix of Orleans, Amboise, Chambord). In 1847, he published the first of his two works devoted to photography " Recueil de mémoires et de procédés nouveaux concernant la photographie». In 1850 he wrote his second treaty "Quelques notes sur la photographie."

At the end of 1840, diplomatic missions were carried out it in Argentina (Plata), then in England, and in London in particular. In May 1850 he was sent to Athens to settle the Anglo-Greek disagreements, in particular those relating to the transfer of the marble of the Parthenon. There he created approximately eighty daguerreotypes, views of monuments, architectural details, general scenes, and several views showing, according to statements from his contemporaries, the waves moving.

From 1851 to 1856, while living in Paris, he devoted most of his time to photography, and judging by the exceptional quality of the plates he produced during that time, Gros fully masters his technique. In this period he connected with the photographic medium that seemed closest: he then enjoyed a great reputation as a technician, an appropriate title if one judges by the exceptional quality of the preserved plates. In 1851, he was one of the founding members of the Société heliographique of which he was the inaugural president, and wrote several of the articles in the first issue of *La Lumière*. In the autumn of 1851, he was again in London, where he is known to have photographed the interior of the Crystal Palace. A little later *La Lumière* tells us that he created five daguerreotypes from the Fête des Aigles sur le Champ de Mars, which formed a panorama of five plates. In 1853, he made prints using negative paper coated with collodion.

In 1854, he was one of the founding members of the Société française de photographie, which replaced the Société heliographique, and exhibited at its first exposition in 1855 his "memories of Athens." Ernest Lacan saw at his place, rue Saint Lazare, the daguerreotypes of Athens and the images of Egypt, now disappeared, and of South America.

In the second half of the 1850s, his diplomatic activity took him abroad again and away from the photographic medium. He was sent as plenipotentiary to Bayonne to determine the exact layout of the Franco-Spanish border, then to China in 1857. From this date the honors flow: he was made a grand Officer of the Legion of Honour, then Grand Cross of Isabelle the Catholic. In 1858, he was named ambassador extraordinaire and then received

full powers to sign the treaty of Tien-Tsin and a trade pact with Japan. In 1859 he was made Senator; then in 1861, Grand Cross of the Legion of Honor. In 1862–63, he became ambassador to Great Britain. His retirement taken, he died in Ivry sur Seine in 1870.

It is not known whether he practiced photography beyond 1857, the date of the last mention of his name in the Bulletin of the Société française de photographie. His production known now consists only of daguerreotypes, as a large majority of the views of architecture, generally full plates, of Colombia, London, Athens, and Paris, but also some reproductions of precision and chemistry, and works of art (engravings, paintings) out of the common run. His work is in the following institutions: National library of France, museum of Orsay, Centers Canadian of Architecture, George Eastman house, Musée Getty, Tokyo Metropolitan Museum of Photography.

QUENTIN BAJAC

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GRUNDY, WILLIAM MORRIS (D. 1859)
English commercial photographer

William Morris Grundy worked in Sutton Coldfield, Birmingham and specialized in stereoscopic views of picturesque rural scenes. The London Stereoscopic Company bought about 200 of his negatives, and individual stereographs still exist. However, Grundy's work is best known for the twenty original albumen prints pasted into the anthology *Sunshine in the Country, A Book of Rural Poetry Embellished with Photographs from Nature (*London: Richard Griffin and Company, 1861).

The book was published two years after Grundy's death. Although it is impossible to be sure, it seems likely that the photographic vignettes were not specially commissioned but that the publisher matched them to suitable poems. Each photograph appears to depict the subject of a particular poem, such as 'The Fowler' or 'The Squirrel-Hunt,' though some illustrate less specific subjects such as 'Rural Pleasures' or 'An Autumn Landscape.' Each plate is one-half only of the original stereoscopic view, some keeping the characteristic rounded top corners. However, many pictures have been cut into roundels or cut squarely at the corners, which removes them from Grundy's own intentions as stereographs. Yet most images retain the structure of stereographs, with bold features in the foreground, middle distance and background.

JOHN TAYLOR

GSELL, EMILE (1838–1879)
French photographer

Born in Sainte-Marie-aux-Mines (Alsace, France) on December 31, 1838, E. Gsell was, like J. Thomson, one of the first ever to photograph the temple of Angkor Vat in June 1866. He was then following the exploration mission of the Mekong, under the commandment of E. Doudart de Lagrée.

In September or October 1886, he established a studio in Saigon. Afterwards he participated to two other official missions; one in Hue, April 1875, under navy lieutenant Brossart de Corbigny, the other upstream the Red River, with de Kergaradec, French consul in Hanoi, from November 1876 to January 1877.

The utmost quality of his photographic production owed him a medal of merit during the World's fair of 1873 in Vienna. He was on of the first professional photographers to settle in Saigon and probably the only one to remain in practice there such a long time, until his demise on October 16th, 1879. The collection of his works was then exploited first by O. Wegener in the early 1880s, then by Vidal, under his name or under Salin-Vidal, until the end of 1883. His works comprises hundreds of photographs, portraits, landscapes, most of which may be found in the photo archives of Guimet museum, Paris.

JÉRÔME GHESQUIÈRE

THE GUM PRINT

"Gum printing" should really be called colloid printing or the pigment process**.** The *colloid* is any liquid which, when combined with an appropriate sensitizer, becomes capable of hardening when exposed to light; in the case of 'gum printing,' the colloid can be made from a combination of: gelatin, or egg white, fish glue, or the more commonly used gum arabic, together with potassium or ammonium bichromate (the sensitizer), together with the pigment as colouring material (you can also use gouache, watercolour etc.) This *combination,* colloid + sensitizer + colouring, is called a *mucilage* or, in more common usage, an *emulsion.*

Thus the term 'gum print' covers a variety of different processes which came into their own during the heyday of nineteenth century "Pictorialist" photography with its advocacy of photography as a form of self expression on a par with other art forms, principally painting and printmaking. In order to become a similar 'art' Pictorialist photographers, influenced principally by the British

Gsell, Emile. Angle d' Une Cour Interieure de la Grande Pagode. *The Metropolitan Museum of Art, Gilman Collection, Purchase, The Horace W. Goldsmith Foundation Gift, 2005 [2005.100.501 (34)] Image © The Metropolitan Museum of Art.*

photographers Oscar Rejlander (1813–1875) and H. P. Robinson (1830–1901), believed that the photograph must therefore be capable of similar *manipulation* of materials as that enjoyed by the painter or printmaker. Manipulated photography became the rage which spread to Europe and the United States. Many felt that the image became art the more it did not look like a photograph. The processes allowed for coloured images with soft, textured surfaces, similar to the mezzotint, etching, watercolour, chalk, pencil, and crayon drawing, and even to the extent of mirroring oil painting. Thus their photographs took on more and more the visual characteristics of artists' prints and drawings. As a result the characteristic sharpness of the camera's negative dissolved and 'out of focus' became the prevailing style. The justification, both theoretically and stylistically, was derived from the American painter James Abbot McNeill Whistler (1834–1903) with his "out of focus" paintings and etchings and his advocacy of "art for art's sake"; that a picture should be nothing but a picture. Whistler had no particular interest in photography and thus it demonstrates the closeness of those who wished photography to be an art to that of painting and printmaking. It was his translations from nature that was most copied, along with some of the compositional and visual devices of the painter Edgar Degas (1834–1917). The process was published by the main French exponent Robert Demachy (1859–1937) and Linked Ring member Alfred Maskell in *Photo-Aquatint, or the Gum Bichromate Process* (London, 1897), and by Demachy in 'The gum bichromate process,' *The Photographic Journal* (28.04.1898). The Pictorialist High Art Movement was not without its critics who viciously labelled them "paperstainers," with their "precious daubs" signifying only "meretricious effort." They were all swept away after the turn of the century with the emergence in the USA, led by Alfred Steiglitz, one time fellow Pictorialist, by "Straight" photography with its backlash to "truth to materials" using "unmanipulated" negatives, derived from the earlier idea that photography was fundamentally different

from painting, drawing and printmaking and thus had different attributes. With today's sophisticated methods of photo-manipulation, available by computer (now used even in journalism!), to create once again fictions that pretend to be real, contemporary photographers *et al* no longer need to despise those who worked in the same tradition in the 19th century.

In 1855 Alphonse Poitvin, regarded by many as the father of gum printing, in an attempt to make more permanent images than silver prints, published his results of using various colloids, but it was not until 40 years later that the pigment process came into its own when photographers wished to make images in a certain way. The knowledge of the colloid process went much further back than Poitvin: in 1798 Vauquelin, French, knew the effect of bichromate as a sensitizer; Mungo Ponton, Scottish, patented this in 1839; the French physicist Edmond Bequerel had found that the size in paper, when combined with a chromic salt, caused the paper to become sensitive to light.

A sheet of paper is thus coated with gelatin or gum arabic, mixed with pigment and sensitized with gum bichromate. This emulsion hardens when exposed to light and becomes insoluble in proportion to the densities of the negative; called a gum bichromate or photo-aquatint**.** Because the sensitizer is too slow for an enlarger, negatives have to be the actual size of the print and processed by contact printing. After exposure any excess of unhardened emulsion is washed out and the whole hardened further with sodium or potassium bisulphate. All sorts of combinations are possible; using several negatives, including drawn and painted ones, and parts of cut negatives (to build a composition, as in painting), various colours of pigment, together, or one layer on top of the other, will produce the multiple gum print**.** All can be fixed to a variety of watercolour and drawing papers. Because the process is restricted to the translation of a few simple tones (whatever kind of negative is used) and that the colour source is contained within the emulsion, and has to be physically coated onto the paper (usually by brush), the end result can provide an equivalent texture and mark, including brush stroke, pencil line, to that obtained by hand in drawing and printmaking. It allowed therefore for a similar method of working *towards a final image* as draughtsmen and printmakers enjoyed; parts could be removed, added to, printed over, the tonal values altered, so that, under a glass frame, it is often difficult to tell if you are looking at a drawing, print or photograph. It was thus also favoured by many who could not draw or paint *but wanted to*. The main technical problem was that of registration and often the result was that "out of focus"—now called soft tone impressionism, became merely a multi focus blur.

Because of the thickness of the dried emulsion the colloid process lent itself to other adaptations. A gum print could be formed on top of an initial platinum print to produce the gum platinum (1902). Glycerine together with various strengths of oxalate solution can be painted on to deepen tones. The carbon print sat along side the gum print and was also patented by Poitevin in 1855, and perfected by Joseph Swan in 1864 by introducing image transfer. Manufactured colloid papers using carbon came in a variety of colours from red chalk to dense green but could not be manipulated. They produced, however, the finest tonal range, accuracy and most permanent images of all the colloid processes and were seen as a more accurate and controllable form in preference to the instability and difficulty of obtaining sufficient control over tone than the gum print. Thus the gum print had many similarities with other processes that used a similar colloid system, such as the oil print (or oil pigment process), also patented by Poitvin 1855, and the oil transfer print**,** revived by G. E. H. Rawlins in 1904 and also popularised by Robert Demachy. The next developments included the bromoil print, bromoil transfer and dye transfer.

In the end, whatever artists, photographers, thought of the value of the results of the gum printing process—it has to be said mostly disparaging then and now, the simple *gum print*, the practical applications of a *sensitized colloid,* became a vital part of the development of the printing industry.

ALISTAIR CRAWFORD

See also: Carbon Print; and Photogravure.

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GURNEY, JEREMIAH (1812–1886)

Originally a jeweller in Saratoga, Gurney was one of the first to study photography under Professor Morse. In 1840 he moved to New York, where he opened a gallery, sold daguerreotypes and offered portrait sittings. His photographic gallery was the first to open in America. At his premises he taught numerous people, including his more famous rival, Matthew B. Brady. He achieved success in photographing society people, exhibited internationally and attended the Great Exhibition in 1851 at the Crystal Palace, London. He also won the coveted Anthony Pitcher prize in 1883. In the 1850's he broke new ground by using mammoth daguerreotype plates, and he constantly experimented with new photographic methods, such as mezzo graphs. He worked with a number of people; for example, John Bishop Hall on the Hal-

lotype, and he was in partnership with C.D. Fredericks at one point in his career, and then with his son, Benjamin. As well as photographing celebrities, such as Dickens, Gurney undertook theatre photography. Gurney had no problems with working in what had been seen as a morally dubious part of society. He also frequented a well known medium and psychic artist based in New York. This may be why he was the first to photograph a dead president. He photographed Abraham Lincoln, in his open coffin, on April 24th 1865. This photograph was hidden in the Illinois State Historical Society, until its discovery in 1952 by a fifteen year old Ronald Rietveld, where it was promptly confiscated, until its later rediscovery, again by Rietveld.

JO HALLINGTON

GUTCH, JOHN WHEELEY GOUGH (1808–1862)

English photographer and editor

John Wheeley Gough Gutch was born at Kingsdown, Bristol, in south-west England on 23 December 1808. He left Britain for Italy in 1831 and in December 1832 married Elizabeth Frances Nicholson and a year later a son was born.Gutch worked as a medical practitioner in Florence and, before the invention of photography, made many pencil drawings of Florence and the Italian Lakes, probably with the aid of a camera obscura (or camera lucida). Interestingly, William Henry Fox Talbot was attempting to sketch in Italy in the early 1830's and it was his failure to satisfactorily record scenes with a similar instrument that led to his idea of photography.Gutch and his family left Italy in 1835 and returned to Britain where he appears to have been practising medicine at Swansea in South Wales, where, in March 1838, his young son, John Frederick Lavender Gutch, sadly died.

Gutch was interested in a wide variety of scientific pursuits—he was a member of the Meteorological Society of Great Britain and a fellow of the Linnean Society. He maintained a tide gauge at Swansea and corresponded with astronomer royal Sir George Biddell Airy (1801–1892).He was also interested in geological phenomena and later made many photographic studies of quarries and rock outcrops.Insects were another fascination, having a particular interest in Coleoptera (winged beetles), which he collected on his travels.

Around 1851 he abandoned medicine and became a Queen's messenger, a government post which involved taking diplomatic dispatches to European cities.It was on a mission to Constantinople that he became ill and suffered the partial paralysis which forced his retirement from diplomatic service and later prompted his photographic quests "...in Search of Health and the Picturesque."

Gutch was experimenting with photography as early as 1841 (no early work is known) and was in contact with the photographic chemist Robert Hunt.Hunt passed on a letter from Gutch to Talbot which asked Talbot's advice on preparing paper negatives.Talbot replied, sending Gutch a "specimen of good iodised paper" and "a few specimens as requested." (Schaaf.The Correspondence of WHF Talbot. 14 Sept 1841, document no: 04333).

Gutch was born and lived in the south west of England, which became the birthplace of early British photography; Talbot was at Lacock in Wiltshire and many well-known early photographers worked and lived in and around Bristol and nearby South Wales. These included: Nevil Story-Maskelyne, John Dillwyn Llewelyn, Hugh Owen, the Reverend Calvert Richard Jones and the Rev. Francis Lockey along with photographer friends of Gutch: John Morgan and John Bevan Hazard. Gutch knew and photographed the early photographer, the Reverend George W. Bridges, who also lived in Gloucestershire. He was also in contact with the photographic printer and editor of *Photographic Notes*, Thomas Sutton, who was at St. Brelade's Bay on the island of Jersey.

Between 1856 and 1859 Gutch supplied several articles for Sutton's *Photographic Notes* including: "Recollections and Jottings of a Photographic Tour, Undertaken during the Years 1856–7 [&1858]" and "Positive Pictures Taken From the Camera of a Peripatetic Photographer in Search of Health and the Picturesque 1859." These essays provide some insight into his work and methods, including his preferred camera (from 1856 he used an Archer's wet-plate camera, designed by photographer and inventor Frederick Scott Archer). This allowed the operator to prepare and develop the glass negatives within the camera itself, doing away with the need for a separate darktent. Archer's camera was, however, bulky and with Gutch's infirmity it would of required an assistant to help. Many of his landscapes show Gutch in the image, indicating third-party assistance. Gutch appears to have travelled to his photographic destinations mostly by train,often hiring carriages from railway stations to his chosen location.

Gutch's preferred subjects were influenced largely by the cult of "The Picturesque." (At the end of eighteenth century artist and author William Gilpin (1724-1804) invented the term "Picturesque Beauty" which he defined as: "that which would look well in a picture"). Gutch avoided photographing industrial, urban Britain and concentrated rather on recording picturesque scenes: ruined ancient buildings,geological formations,rocky streams and trees, particularly old elms and oaks, were all favorite subjects.

In 1856 Gutch visited the English spa town of Malvern to attempt a cure for his illness. He attended James

Manby Gully's Hydropathic Establishment where Gutch hoped that the controversial Dr. Gully's water treatment would help his paralysis. He also thought that the discipline of photography would beneficial to his health. He spent two months photographing Malvern and the surrounding areas, recording old houses, lanes and ancient trees along with a few small portrait studies. Later the same year he spent several weeks in Devon, where he made studies of streams as well as street and beach scenes (including a few three-part panoramas).

Gutch mainly worked with whole-plate wet-collodion glass negatives and printed his photographs on salted paper.He mounted his work into slim,soft-cover albums where he initialled, titled and dated the images, often decorating the title page to each album with a photographic collage. The collages were made by placing leaves, flowers and feathers in printing frames (in contact with salted paper) to produce negative images (photograms) which were then cut up, made into patterns and pasted onto the page, Gutch often writing an epigraph or dedication in the centre, using quotes from a wide range of authors and poets, reflecting his literary background.Gutch was from a well-read middle-class background (he edited the annual Literary and Scientific Register for many years) and was at one time prospective editor of *The British Journal of Photography*.

In 1857 Gutch travelled further afield, taking his cumbersome camera to the English Lake District, Scotland and North Wales. In "Recollections ...1856–7" *Photographic Notes* part 4, vol. 3, no. 60, 1 October 1858, 230. Gutch wrote that he considered his camera couldn't do justice to the Lakeland landscape, it being more suited to the "brush and the painter." In consequence he took few images of the lakes themselves and concentrated on intimate rustic scenes and architecture,spending three days photographing the ruins of Furness Abbey. In Scotland he again avoided the natural landscape and concentrated on ruined castles and abbeys (*Photographic illustrations of Scotland 1857 Album*, George Eastman House collection). His visit to North Wales provided a chance to record a larger variety of his usual subjects such as quarries, coastal landscapes,cliffs and bridges.

By the Spring of 1858 he was at work recording local architecture in and around Bristol. In August he headed further west,spending three months in the Land's End area of Cornwall where he photographed rock formations, quarries, coastal scenes, ancient tombs, local fishermen and boats.

By 1859 Gutch had set himself the daunting task of photographing every church in Gloucestershire (over 500). Even though the Bishop of Bristol and Gloucester, The Hon. Charles Baring, had promised to order a copy of each church photographed, this must of been a difficult and expensive undertaking.Gutch even purchased a new Ross Petzval wide-angle lens to aid his task. Even today it would be a daunting task to record every church, Gutch, however, managed the remarkable feat of photographing at least 200 of them in five months but the church series seems to have been his last major photographic project;the summer of 1859 had been hot and perhaps the exhausting task of recording so many country churches had taken its toll on Gutch's already frail health.

Gutch died, less than three years later, on 30 April 1862 at 38, Bloomsbury Square, London, aged 53.

Ian Sumner

Biography

Gutch was born on 23 December 1808 in Bristol, England, where his father, John Mathew Gutch (1776–1861), was a journalist, publisher and bookcollector.John Gutch senior was a former schoolfriend and member of the literary and scientific circle that surrounded the writer and poet Samuel Taylor Coleridge (1772–1834). Also in this circle were the early photography experimenters Thomas Wedgwood and Humphrey Davy.

JWG Gutch trained as a surgeon in Bristol and practised medicine in Italy and later Swansea, South Wales. Later he quit medicine and became a Queen's messenger. He also edited the annual Literary and Scientific Register. He was experimenting with photography as early as 1841, but did not pursue it seriously until the mid 1850's. His busiest years were from 1856–1859 when he travelled around the south west of England, Wales and Scotland recording architecture and "wayside scenes." He showed his work at several Edinburgh and London Photographic Society exhibitions between 1856–61.

See also: Archer, Frederick Scott; Bridges, George Wilson; Hunt, Robert; Owen, Hugh; Sutton, Thomas; Talbot, and William Henry Fox.

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GUTEKUNST, FREDERICK (1831–1917)

American photographer

Known as the "dean of American photographers," Frederick Gutekunst was born in Philadelphia, Pennsylvania on September 25, 1831. A prominent portraitist and professional photographer whose work was prolifically published, Gutekunst, the son of a German cabinetmaker, served apprenticeships with a lawyer and a druggist before opening his first studio in 1856 with his brother, Louis. He photographed celebrity authors, artists, scientists, foreign dignitaries, Civil War generals, and presidents, as well as ordinary citizens, and kept detailed ledgers of his sitters, one of which survives at the Library Company of Philadelphia. A member of the Photographic Society of Philadelphia 1862–1900, Gutekunst gained recognition for his set of Gettysburg battlefield views, and for printing in 1876, what was then the world's largest photographic mural, a 10 foot wide by 18 inch high panoramic view of the Centennial Exposition made from seven negatives. As official photographer for the Pennsylvania Railroad, he documented structures and scenery of three of its divisions in 1875. In 1878 he purchased the rights to the phototype process, a photomechanical process allowing mass production of high-quality reproductions of photographs, which proved to be an additional boon to his business. Gutekunst worked until eight weeks before his death at his Philadelphia home on April 27, 1917.

CHARLENE PEACOCK

GYOKUSEN, UKAI; See UKAI GYOKUSEN

H

HAAS, PHILIP (ACTIVE 1840s–1860s)
German daguerreotypist

Born in Germany around 1808, Philip Haas emigrated to the United States in 1834 and established himself as a lithographer and print publisher in Washington, D.C.

When the invention of the daguerreotype was announced in 1839, Haas possibly went directly to Paris to learn the art. Although his earliest documented daguerreotype is dated March 1843, Haas was still among the first resident daguerreians in the nation's capital.

With his image of John Quincy Adams in 1843, Haas became the first to produce a lithograph directly from a daguerreotype. In 1844, he moved to New York City and established a daguerreian gallery on Broadway. Between 1844 and 1860, he moved up Broadway at least four times.

In 1861, at age 53, Haas lied about his age to enlist with the First New York Engineers, which was sent to South Carolina. Here, he was detailed with Washington Peale to shoot photographs. Their most distinctive image shows the USS *New Ironsides* in action in Charleston Harbor as the smoke from its broadsides trails into the southern sky.

Haas apparently was weakened by ill health in 1862. He resigned from the army on May 25, 1863 and from here the trail of his life is lost.

BOB ZELLER

HAES, FRANK (1833–1916)
English photographer

Frank Haes was born on 3 January 1833 in the Hambro Synagogue, London and died in 1916 in the same city.

He first exhibited his photography in 1858 at the age of 25, by which time he had emigrated to Australia and married London-born Adele Valentine in Sydney. The 1858 exhibition of the Photographic Society of London included five of his views of his adopted city.

By the early 1860s, the family was back in London, and Haes was earning a reputation as a photographer of stereoscopic views of zoo animals—including what is acclaimed as the first photograph of a living elephant, and rare photographs of a *quagga*! These stereocards were published by McLean & Haes of 26 Haymarket, London. McLean & Haes also produced cartes de visite, even designing and manufacturing their own four-shot camera specifically for the purpose. A rear-focussing half plate studio camera was designed and marketed by the enlarged partnership of McLean, Melhuish & Haes in the later 1860s.

At the International Exhibition of 1862, McLean & Haes achieved awards for their 'coloured photographs,' and two years later they wrote to W.H.F Talbot to arrange to photograph Talbot as part of a series they were creating of Fellows of the Royal Society.

When the 1901 Jewish Encyclopedia was published, Haes was acknowledged as one of those who had provided illustrations.

JOHN HANNAVY

HALE, LUTHER HOLMAN (1823–1885)
American daguerreotypist

Luther Holman Hale, one of Boston's better known daguerreian artists, was listed with a gallery there from 1845 to 1862. He was born September 21, 1823, in Milbury, Massachusetts, and apparently first went into business with his brother, C. E., on Milk Street in Boston before opening his own gallery.

From 1846 to 1850, with Benjamin French as a partner, Hale did business at the L. H. Hale & Co. Daguerreotype Miniature Rooms at 109 Washington Street, advertising: "Miniatures taken in any weather,

with or without colors, in a superior style, and neatly set in Lockets, Pins, Rings, Bracelets, or Cases." The firm also sold daguerreian materials.

From 1850 to 1857, Hale continued at the same address alone before listing G. A. Ayling as a partner in 1858 and 1859. Hale also taught the daguerreotype process and perhaps his best-known student was William Herman Rulofson, one of the first great American western photographers. He continued to be listed in Boston through 1862.

Hale died in 1885 and his personal collection of family daguerreotypes is preserved today at the American Antiquarian Society in Worchester, Mass.

Bob Zeller

HALF-TONE PRINTING

Half-tone is a widely used photomechanical printing process where a photographic image is translated onto the printed page as a fine pattern of dots. The dot pattern is so fine that the individual dots cannot be seen by the naked eye. Rather the naked eye blurs the dot pattern into an image that appears to have the quality of a photograph. The dot pattern can be seen under magnification. Half-tone was an important invention as it provided an effective process for commercial printers to mass print photographically realistic images. Invented in the 19th century it still commonly used today in commercial printing. It is often referred to as the *screen process* or *dot process*.

Before the half-tone process, the pages of newspapers and magazines did not contain the photographically realistic images that we take for granted today. The most common type of picture in a newspaper was a woodcut or wood-engraving. These prints, made from hand carved blocks of wood, could not produce the minute details and subtle tones of a photograph. While often attractive, these prints more resemble hand drawn sketches.

Since the invention of photography, commercial printers wanted a practical way to realistically reproduce photographs onto the printed page. The essential problem lay in the fact that the most common mechanical printing processes can only print areas of ink or leave blank areas on the paper. They could print different tones. A newspaper press could only print black or nothing. Photographs, on the other hand, have a range of tone, meaning there are various shades of gray between black and white. This is what gives photographs realistic images. While there were earlier mechanical printing processes that could imitate the tone and subtle details of a photograph, most notably the Woodburytype, these processes were expensive, difficult to make, and not practical for mass commercial printing that used relief printing.

The half-tone process overcame these limitations, offering a practical process that could create near photographically realistic images. The half-tone process translates the tones and detail of a photographic image into a printed pattern of tiny dots or similar marks. With a magnifying glass these dots can be seen. Examination of a photographically realistic picture in a modern newspaper or magazine reveals the half-tone dots. Though it was later applied to a variety of printing processes, its initial triumph was that it could be applied to relief printing, which was the staple of the book, newspaper and other periodical industry.

The traditional half-tone process in relief is as follows: First, a negative is made by taking a picture of the desired item through a special screen. Sometimes a glass with crossed lines is used instead of a screen. The screen breaks up the illuminated image into a pattern of dots on the negative. The lightest areas of the object create large dots close to each other. The darkest areas of the object create smaller dots further part. The negative is then used to expose the printing plate that has a photographically sensitive coating. The dots sizes are reversed on the printing plate. This means that the largest dots on the negative become the smallest on the printing plate, and vise versa. The printing plate is developed, the unexposed areas are washed away, and the plate is etched. The finished printing plate has the dot pattern in relief (raised from the rest of the plate). During printing, ink is placed on the raised dots, which is translated into a pattern of dots on the printed page. Depending on the fineness of the screen used, there will be more or fewer dots per inch in the print. The more dots per inch, the higher the quality of the image. On rough paper, such as newspaper, fewer dots per inch are necessary. On fine paper, more dots per inch are best.

The first half-tone print in a newspaper appeared in 1880. By the 1890s, many newspapers and magazines had half-tone images.

Half-tone applied to intaglio printing is called photogravure. Photogravure has a similar dot pattern, but the ink is deposited in different amounts. In the dark areas of the image, where the ink is the heaviest, the ink is physically raised from the paper. This quality is observed under a microscope. Photogravure could create quality images, but not lettering. Half-tone could be applied to lithography in the 19th century, but was not widely used in commercial printing until the 20th century. Today, most newspapers, magazines and other commercial prints use lithography.

Color Half-tone. Half-tone printing is often tinted or colored by printing solid colors onto the black half-tone print. Sometimes, a black and white half-tone print is hand tinted (2 additional colors) or hand colored (3 or more colors). To make a true color half-tone, printing plates are made, each for a different color. In the 19th

and early 20th century, the colors were red, blue, yellow and often black. Today, the common colors are cyan (light blue), magenta (darkish-purple), yellow and black. To make the negative, the object is photographed four times through a half-tone screen and through filters that eliminate all colors from each negative except for the desired color. When printed successively on top of each other, the resulting has the realistic color. If you examine a color picture in a magazine with a magnifying glass or microscope, you will see that the image is made of a made dots of different color. True color half-tone relief printing was introduced in the 1890s, though it did not produce quality color pictures until the turn of the century. In this printing, black ink was not used until the 20th century. Instead, the red, blue and yellow were printed on top of each other to achieve black. Color half-tone lithography was not commercially successful until the 20th century.

DAVID RUDD CYCLEBACK

See also: Woodburytype, Woodburygravure.

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HAMMERSCHMIDT, WILHELM (active 1858–1870)

Wilhelm Hammerschmidt seemed to have been born in Berlin around 1830. Between 1858 and 1870, he resided in both Cairo and Berlin and operated photographic studios. Besides an extraordinary quality in technical respects, his images resemble the light of the southern parts of the Mediterranean Sea with a hitherto unknown character. In the early years of his Egyptian travels, he worked up and down the Nile River into the Sudan, and covered the Lybian desert as well. He apparently worked for Hermann Wilhelm Vogel. His panoramic views of Egyptian cities and the desert countryside belong to the pantheon of the best material produced of the second generation of travel photographers. Their vision was not only dedicated to the ruins of antique origins alone, but to the integration of everyday life and modernisation as well.

In 1865 Hammerschmidt was offered membership in the Société française de la photographie, in 1867 he showed his photographs at the Paris World Fair. In 1869, Wilhelm Hammerschmidt took photographs of the opening of the Suez canal which were widely published. After this event, he fell into total obscurity. There is no record of his later life.

ROLF SACHSSE

HANSEN, GEORG E. (1833–1891).

Danish photographer by appointment to the king

Georg Emil Hansen was born in Næstved, Denmark, on May 12, 1833. He was out of a family of photographers. His father, Carl Christian Hansen, became a photographer in 1849, initially using the daguerreotype, his father's brother, Just Hansen, also became a daguerreotypist, and his brother, Niels Christian Hansen, became a painter and photographer. In 1854, G.E. Hansen's father opened a studio in Copenhagen. Two years later, G.E. Hansen opened his own studio, also in Copenhagen.

Hansen became one of the most respected and well-paid photographers of his day. Among his regular customers were the Danish Royal Family, not least Princess Alexandra, the later Queen of England. In 1864, he was appointed Photographer to the King. His most famous portraits are, however, of the fairytale writer Hans Christian Andersen, whose large profile he immortalized in innumerable versions.

G.E. Hansen was one of the leading Danish photographers with regards to photographic technique. He was the first to open a studio with paper prints, the first to use prepared gelatine plates, and the first to make full body size enlargements. He exhibited internationally and received medals for his work in London (1862) and Berlin (1865).

JANNIE UHRE EJSTRUD

HARE, GEORGE (1825–1913)

American born photographer and inventor

George Hare was born in 1825 and served an apprenticeship as a joiner before moving to London. He joined the firm of Ottewill, Collis & Co. where he began making cameras and photographic equipment. He stayed with the firm for one or two years before establishing his own business *circa* 1857. Hare's business was last recorded in 1911.

Hare's portable binocular, or stereoscopic, camera was exhibited in 1860 and his 1864 design for a studio camera was popular throughout the century. The New Universal camera was based on W. J. Stillman's patent of 1871.

British patent number 3035 of 27 June 1882 was Hare's main contribution to camera design. He described a camera where the baseboard was hinged to the body of the camera and held in position by brass bars which could be secured in any position by retaining knobs

running in slots on each side of the camera. The lens panel, in common with many Hare cameras was held in position by two vertical rods running in slots on the baseboard. As the *British Journal of Photography* remarked 'it forms the model upon which nearly all others in the market are based.' Hare's only other patent was granted on 7 May 1875 for a photographic changing box which held twelve plates that could be changed within the box without the need for a darkroom. He also made cameras for other camera makers, notably J H Dallmeyer, to sell under their own names.

George Hare was 'regarded as *the* maker of a field or studio camera of the very highest class' whose name 'was a household word among photographers.' Mechanisation in camera manufacture from the later 1880s gradually made Hare's cameras expensive and his designs which had not altered significantly since the 1860s were increasingly seen as being dated and less practical compared to more portable models.

Hare retired around 1911. His son, James 'Jimmy' Henry Hare (1856–1946) had emigrated to America in 1889 where he had a successful career as a photographer and war correspondent. A Quaker, Hare was described as 'an upright, honest, hard-working temperate citizen.' He died in York on 21 November 1913 aged 89 years.

MICHAEL PRITCHARD

HARRISON, CHARLES C. (D. 1864)

American photographer

Sometimes referred to as C.C. Harrison, Charles C. Harrison was an American daguerreotypist and lens maker who was active in New York in the late 1840s and 1850s. In 1846 Harrison began to made daguerreotypes in New York, where he continued to operate until his death in 1864. Little is known about his photographs, but he exhibited, either photographs or apparatus, at the Crystal Palace exhibition in 1853–54, and in other exhibitions in New York through the 1850s.

Harrison is best known for his innovations in camera lenses. In 1849, Harrison began to manufacture high quality lenses and in 1851 was awarded a silver medal at the American Institute for Daguerreian apparatus. He continued to manufacture lenses for daguerreotype cameras, in joint partnership with Edward Anthony and later James L. Scovill. In 1858, Harrison was awarded a patent for a lens diaphragm in 1858. In 1860, he began to work with the German lens designer J. Schnitzer on the "Globe" lens. Patented in 1862 and used primarily for stereo photography, this was the first true wide angle lens that reduced distortion and provided a large, flat viewing field. By that time, Harrison's operation, which he continued to supervise, was jointly owned by Anthony and Scovill, subsequently sold it to Nelson Wright. Harrison died in New York on November 23, 1864.

SARAH KENNEL

HARRISON, GABRIEL (1818–1902)

Born March, 1818, in Philadelphia. Father was an artist and engraver who moved the family to New York in 1820. Harrison made his professional acting debut in 1838, then married, and fathered son George Washington Harrison.

He began daguerreotyping in Plumbe's New York gallery, about 1844. Won first gold medals in 1845, becoming known for daguerreotypes of "religious, patriotic, & poetical subjects." Worked in the M. M. Lawrence gallery from 1847–51, yet remained active in acting & politics.

In 1852, opened the magnificent Harrison & Hill Gallery, in Brooklyn. Continued in various photographic mediums—plus acting—until political life set-backs ended his photographic career in the early 1860's. He remained active in painting, music, & acting in Brooklyn, dying there in 1902, at 83.

He is well-known for promoting high aesthetic & operating standards for photographers. Harrison's famous

Harrison, Gabriel. California News.
The Metropolitan Museum of Art, Gilman Collection, Purchase, The Horace W. Goldsmith Foundaton Gift, 2005 (2005.100.334) Image © The Metropolitan Museum of Art.

daguerreotypes include *The Infant Saviour Bearing the Cross, Young America*, and an 1847 plate of his friend, Poe. Romer suggests he won more awards than any photographer of the period.

The definitive analysis of Harrison is in *IMAGE: Gabriel Harrison: The Poetic Daguerreian*, by Grant B. Romer. The George Eastman House has the Harrison family records and images. A self portrait of him as an actor is in the West Archives.

LARRY WEST

HARRISON, WILLIAM JEROME (1845–1908)

English amateur photographer

Founder of the Photographic Record and Survey Movement, William Jerome Harrison was a remarkable example of the archetypal Victorian polymath. He was an original thinker, a geologist of national repute, an innovative educationalist and a leading figure in the amateur photographic world of the late-nineteenth century.

Harrison did not begin practical 'work in the art-science' until 1881 at the age of 44 years. He had gained an encyclopaedic knowledge of the subject from meticulous studies of the history, chemistry and various applications of photography. Harrison undertook these investigations in his early career as a writer, museum curator and science teacher, as his awareness of the role that photography could play in the illustration of educational material developed. The publication of Harrison's account *A Sketch of the Geology of Leicester and Rutland* in 1877, 'the first geological book… illustrated by photographs' was an early demonstration of the reciprocal relationship that Harrison perceived between science, photography and education. 'Let nature be thy teacher' was reflected on his personal bookplate and became a personal credo throughout his life.

Harrison's photographic self-education was prompted by his belief that 'it is the man who takes as his starting point a knowledge of what others have done and are doing, who will best be able to advance photography in the future.' In 1885 he made another contribution to the advancement of photography with the first of a large number of essays on all aspects of the subject. From the prolific manner in which Harrison contributed to the literature of photography in British and American photographic journals, it might be reasonable to conclude that he had decided to undertake this task single-handedly. By 1887 he had compiled the first complete bibliography of photography, the results of which were published in *The Photographic News*. On completion he had listed and often annotated 328 titles of books of photography. His accounts of the 'bibliography' of the subject were unmatched in his own day and remain important reference works for all modern photographic historians.

Another important project for Harrison was *A History of Photography, written as a practical guide and an introduction to its latest developments… with a biographical sketch of the author, and an appendix by Dr. Maddox on the discovery of the gelatino-bromide process*. This was published in New York by the Scovill Manufacturing Company in 1887 and by various publishers in Britain the following year. Harrison also wrote instructional articles and textbooks with *Photography for All: an elementary textbook and introduction to the art of taking photographs* published in 1888.

In the two decades on either side of the turn of the century, a documentary photographic movement evolved amongst amateur photographic societies that shared the notion of the photograph as evidence. The initiation of this Record and Survey Movement has been ascribed to Sir Benjamin Stone, through his work with the Warwickshire Photographic Survey (WPS), the National Photographic Record Association (NPRA) and the Federation of Photographic Record Societies (FPRS). Although Stone may be credited with aiding the establishment and promotion of Record and Survey photography, it was Harrison who was the visionary and guiding force and truly responsible for the creation, momentum and dissemination of interest in this work.

Shortly after the re-formation of the Birmingham Photographic Society (BPS) in 1885, Harrison as the society's new Vice-President replied to enquiries made to him concerning the goals of an amateur photographic society. As part of the work that Harrison proposed members undertake, he suggested that:

> … by securing accurate representations of old buildings we can furnish a record for posterity whose accuracy cannot be disputed, and whose interest in the future would be great. But I would not only photograph the old buildings, I would secure, on rapid plates, impressions of our streets, of the principal lines of thoroughfare, and of the busy crowds by which they are traversed.

At a 'Special Meeting' called on 11th December 1889, Harrison presented his paper 'Some Notes on a Proposed Photographic Survey of Warwickshire.' In this he points out that only now had such a scheme become possible with the publication of the government map on a six-inch to a mile scale showing the outline of every field and the position of every tree. Warwickshire comprised two hundred sheets of this map. Harrison proposed to allot one sheet of this map to every pair of photographers who were willing to share the enterprise and obtain good negatives of every point of interest within the area allotted to them. He suggested illustrating the state of things 'as they exist today' to be printed on sensitive dry plates and printed in platinum. The size

of picture recommended is whole plate (8½ × 6½ inches) while pictures of other sizes could be bound in special albums, and complete sets of views could be produced for the public reference libraries.

While this proposal was local in nature, Harrison saw it as having a general application and this was reflected in the fact that a dozen or more photographic societies copied this example initiating local surveys. Encouraged by this activity in response to his paper, Harrison developed his ideas on the scale and scope of Survey Photography. In 1892 he read his proposal 'A Photographic Record and Survey' to the Royal Photographic Society (RPS), and in 1893 he presented his paper 'On the desirability of an International Bureau: established to record and exchange photographic negatives and prints' at the World's Congress in Chicago. Although the scheme for a National Survey was thought to be 'impracticable, unwieldy, [and] of doubtful utility' with 'problematical longevity in its execution,' his 1893 paper led to the appointment of an International Committee which considered how his ideas might best be carried out.

Harrison occasionally contributed articles under the pseudonym 'Talbot Archer' and it was the radical Talbot Archer that feared the RPS 'is in too fossilised a state to furnish the men, the energy, and the funds that are needed to inaugurate this great movement.' In 1893 Harrison resigned from the BPS and WPS and retired from mainstream photographic life, after his identity was revealed following the RPS's rejection of a National Survey. The National Photographic Record Association (NPRA) was formally established in September 1897 when Stone was elected as its first, and only president.

Harrison was involved in contributing to the first Geological Photographic Survey of Great Britain and the National Collection of Geological Photographs, initiated by the British Association for the Advancement of Science in 1899, contains hundreds of examples of his work.

There was no lack of support for record and survey photography at a local level and picking up on these trends in 1906 Harrison presented a paper on 'The desirability of Promoting County Photographic Surveys' at the Annual Meeting of the British Association of the Advancement of Science. This paper, which may be seen as one of the definitive texts on Survey Photography, traced the evolution of the movement and acknowledged the work done by the NPRA. Harrison declared the 'three great objects' of Surveys were to benefit 'the individual photographer, the Scientific and Photographic Societies and the nation generally' maintaining that survey work was 'a liberal education for any man' for it was impossible to 'photograph without learning much about the objects photographed.' He appended an encyclopaedic set of 'Suggestions and Memoranda' and proposed the establishment of a Committee to collect, disseminate and coordinate the work of these surveys. Both he and Stone were subsequently nominated as members of a provisional committee, but Harrison never lived to see the fruits of its labours.

MICHAEL HALLETT AND PETER JAMES

Biography

William Jerome Harrison was born at Hemsworth, Yorkshire on the 16th March 1845 and died in Birmingham on the 6th June 1908. While still a child he accompanied his parents to Australia in the hope of improving his father's health, to no avail as his father died shortly after the family's arrival. On his return to England Harrison was educated for seven years at the Westminster Training College and afterwards for two years at Cheltenham College. A brilliant pupil, he graduated as Senior Prizeman and holder of the highest obtainable Government Certificate. He was appointed as Headmaster of a large boys' school in Leicester in 1870. His scientific education may be said to have commenced in 1868 when he began to study for the examinations of the Science and Art department. Within the next ten years he carried off the highest distinctions in chemistry, physics, geology and physical geography, being a gold medallist in the last two subjects in 1872. During these years he spent much time in the laboratories of the Government Science Schools at South Kensington. In 1872 he was appointed Chief Curator of the Leicester Municipal Museum where he established very large and successful science classes. He was elected a Fellow of the Geological Society (FGS) in 1876. In 1880 he was appointed Science Demonstrator to the Birmingham School Board. With a large staff of assistants, well appointed laboratories and a Technical School, he directed the scientific studies of about six thousand elder children and some hundreds of younger teachers. For continuing work in geology he received the Darwin Medal in 1884. Harrison became a widely read journalist, contributing articles on a broad range of subjects to respected publications.

See also: Books and manuals about photography: 1870s; Photographic News (1858–1908); Royal Photographic Society; Photohistorians; and Stone, Sir John Benjamin.

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HARROLD, SERGEANT JOHN (ACTIVE 1860s–1890s)

A member of the Royal Engineers, Harrold was in charge of the photographic section (10th Company), during the Abyssinian Campaign of 1867–68, in which British forces invaded Ethiopia to free European hostages taken prisoner by King Theodore. The resulting photographs represent the first occasion in which the work of the Royal Engineers' photographic school was put into practice in the course of a military campaign. This documentary record of the progress of the campaign produced a series of some 60 images, from which albums were later produced, and for which Harrold received the commendation from the *The Photographic Journal* (May 16, 1868) as 'the right man in the right place, as combining within himself the qualities of a skilful photographer and the power of accommodating himself to any circumstances.' These 'pictorial views,' however, were considered of lesser importance from a military point of view than the more than 15,000 prints of maps produced during the campaign by Harrold and his five assistants. Harrold's subsequent career was spent in India. In 1873 he joined the Survey of India in Calcutta as a photographer and in the following year assisted James Waterhouse in the taking of a series of 100 photographs at Roorki of the Transit of Venus. He remained with the survey department until his retirement in 1898.

JOHN FALCONER

HARTMANN, SADAKICHI (1867–1944)

Critic, poet, and lecturer

As a perceptive observer, and talented writer and critic, Sadakichi Hartmann contributed much to an emerging Modernism in the United States at the end of the nineteenth century and early twentieth century. In particular, Hartmann played an important role in the history of photography.

Carl Sadakichi Hartmann was born on the island of Deshima in Nagasaki Harbor, Japan in 1867 to a Japanese woman, Osada, and a German government official, Carl Herman Oscar Hartmann. His mother died several months later.

Motherless, Sadakichi and his brother Tanu were sent to be raised by his paternal grandmother and uncle in the upper middle class society of Hamburg, Germany. At age fifteen young Sadakichi was sent off to the naval academy, but quickly ran away, and was subsequently sent to live with relatives in the United States in Philadelphia.

Two years later Hartmann left his puritanical relatives, and obtained work at a lithographer's shop designing tombstones, while reading avidly at the Mercantile Library in Philadelphia in his free time. By 1884 Hartmann was devoting full time to his studies supported by an allowance from his grandmother.

In that same year, Hartmann met Walt Whitman, who was to become a major influence on Hartmann's writing. The older poet and sensitive young man initially admired each other. Whitman saw Hartmann's mixed heritage and experience in Europe as an advantage in presenting new perspectives on American culture. Hartmann recorded his visits with Walt Whitman in a small book, *Conversations with Walt Whitman"* (1895).

Following eight months of apprenticeship at the Royal Theater in Munich, Germany, in 1885 and visits to various German artists' studios, Harmann returned to the United States once again. By the late 1880s he began writing art criticism in Boston. Continuing to travel abroad, his articles from Europe were published in Boston papers.

In Boston, Hartmann attempted to produce an Ibsen play, which failed, sending Hartmann to New York, spending several unsuccessful years there during which he became increasingly depressed. In 1889 he wrote his controversial erotic play, *Christ*, which was burned in Boston when copies were distributed. The young author spent Christmas of 1893 in the Boston Charles Street jail for having published obscene literature.

In 1891 he attempted suicide. His hospital nurse, Elizabeth Blanche Walsh, was to become his wife.

Recovering enough to write again, Hartmann met S.S. McClure, who sent him to Paris on assignment for the McClure Syndicate. There Hartmann met the Symbolist poet, Stéphane Mallarmé, and other Symbolists. Hartmann's own writing was to become informed by the Symbolist aesthetic with its poetic capacity to suggest another reality, a world that prized dreams, mystery, intuition, and innuendo.

In 1893 Hartmann launched his own magazine the *Art Critic* visiting over seven hundred and fifty studios in New York, Boston, and Philadelphia to get subscriptions. But the magazine failed after three issues. By the late

1890s Hartmann was trying his hand at various types of journalism, from sketches of New York life ranging from studies of the poor to the upper class for the *New York Staats-Zeitung* to articles on pictorial photography for *The Critierion*; to critiques of dance performances.

Hartmann himself was an avid dancer, and had skills as a visual artist. He painted and did pastel work as an amateur much of his life. Exhibitions of his work were held in 1894, and in 1900 at the Allen Gallery.

Hartmann met Alfred Stieglitz in 1898, a meeting that was to become important for both men's lives—Stieglitz recognized Hartmann's writing talents and hired him to write for his publication "*Camera Notes*" and subsequently for the well-known *Camera Work*.

Hartmann's articles for Stieglitz's publications helped elevate photography to the realm of fine art. Articulate, poetic, and direct, Hartmann's vision and voice were strong and persuasive. As example, Hartmann wrote in 1898, "Whenever I have spoke of the possibilities of photography becoming so independent and artistic that it can claim to be ranked as one of the expressions of pictorial art, the work of men like Robert De Machy, and Alfred Stieglitz has formed the basis and starting point for my speculations. Alfred Stieglitz is to me indisputably the foremost photographer of America…"

Or in 1902, Hartman wrote, "I had seen them depart on their great mission, those valiant Knights of Daguerre [Stieglitz, Keiley, Steichen, Coburn]. I had seen them depart on their perilous journey over the Allegheny Mountains to open the Secession Shrine in Pittsburgh…Imagine my ecstatic joy when I received a telegram…money enclosed. We cannot do without you…So I sharpened my pencil, took my dress-suit out of pawn, bade farewell to my wife and offspring, and set forth on my nocturnal pilgrimage." (Above quotations from Sadakichi Hartmann, *The Valiant Knights of Daguerre,* Harry Lawton and George Knox eds., Berkeley: University of California Press, 1978, 159, frontispiece.)

Hartmanns profles of various photographic pioneers such as Stieglitz, Edward Steichen, Clarence White, Gertrude Käsebier, F. Holland Day, Frank Eugene, etc., helped bring the new work of these photographers to the public eye.

By 1901, Hartmann had published his *Shakespeare in Art*, his first book in art, and in 1902 he published the first *History of American Art* (Boston: L.C. Page & Co.), as well as a portfolio edition of *Modern American Sculpture*. The *History* was used for many years as a standard textbook, and revised in 1938. In 1903 he published a book on *Japanese Art.* Two other books, *The Whistler Book* and *Landscape and Figure a Composition* were published in 1910.

Hartmann's critical writings tended to be less analytic, more poetic, than much criticism, often becoming works of art in themselves in response to the beauty of a visual art piece. As he noted in his prose poem, *White Chrysanthemums*,"'…to learn to look at pictures…we look at the flush of the evening sky, at a passing cloud, at the vision of a beautiful woman, or at a white chrysanthemum" (*Camera Work,* No. 5, January 1904, 119–120).

In 1902 Hartmann also began using the pen-name of "Sydney Allan" for a number of articles. From 1904 to approximately 1907–08, Stieglitz and Hartmann become distanced from one another and Hartmann wrote primarily about the Salon Club photographers rather than Stieglitz and the Photo-Secessionists. In that interim period Hartmann also lectured to the National Center of Photographers and began a lecture tour throughout the United States, these tours lasting until 1910.

In 1906 Hartmann was also commissioned to assist John Beatty, Director of the Carnegie Institute, to acquire American Drawings.

Hartmann's health began to deteriorate by 1911, and he decided to leave New York City and the art world, moving to East Aurora, New York, where he met Lillian Bonham, whom he subsequently moved west with, while continuing to give lectures and write for numerous American photography journals from 1912–1918.

Moving to Los Angeles in 1923, Hartmann tried to cultivate the "Hollywood Scene." For a number of years he was the Hollywood columnist for the London publication, *"The Curtain."* He even appeared in a small part as the court magician in Douglas Fairbanks' *The Thief of Baghdad.* In general, though, Hartmann's years in Hollywood were the beginning of a slow slide into obscurity, even though he was often at parties with W.C. Fields, John Barrymore, and a literary group that gathered at Margery Winter's home, all liking to hear and see Hartmann's sharp wit, recitations, and dance routines.

In the last years of his life, beginning in 1938, Hartmann retreated from Hollywood, and built a shack in the California desert near the home of his daughter Wistaria Linton, on the Morongo Indian Reservation in Banning, California. There he sporadically wrote and painted pastels, and corresponded with other writers such as Ezra Pound and George Santayana.

World War II brought nightmarish treatment to Hartmann as the FBI interrogated him due to his Japanese-German background, and threatened to intern him. Many of Hartmann's friends, questioned by the FBI as well, stopped seeing or calling him. The harassment never completely ended. On November 21, 1944, Hartmann died at the home of his eldest daughter, Atma, in St. Petersburg, Florida, where he had gone to gather material for an unfinished autobiography.

Hartmann's contribution to American culture and the history of photography was unique, given his Japanese-

German heritage. His poetic insight and sense of purpose were significant in examining the rise of American Modernism and in helping transport photography to the realm of Fine Art.

KATHERINE HOFFMAN

Biography

Carl Sadakichi Hartmann was born in 1867 in Japan to a Japanese woman, Osada, and Carl Herman Oscar Hartmann, a German government and business official. Since his mother died a few months later, the young Hartmann was sent to Hamburg, Germany, with his brother Tanu, to be raised by his paternal grandmother and uncle. He came to the United States in 1882. In 1884 he met Walt Whitman, and in 1898 he met Alfred Stieglitz, two major influences on his life and work. Writing also under the name of Sydney Allen, beginning in 1902, Hartmann was prolific as a critic, poet, and dramatist. Many of his signficiant pieces appeared in Stieglitz's *Camera Notes* and *Camera Work.* In 1902 his well known two volume, *A History of American Art* was published. In 1923 Hartmann moved to Los Angeles and attempted to become part of the Hollywood crowd. In 1938-1939 he built himself a small place near his daughter, Wistaria, in the California desert. He died on November 21, 1944, on a visit to his eldest daughter, Atma, in St. Petersburg, Florida.

See also: Stieglitz, Alfred; Steichen, Edward J.; White, Clarence Hudson; Käsebier, Gertrude; and Day, Fred Holland.

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HAUTMANN, ANTON (1821–1862)

Painter, sculpter, photographer, and studio owner

Anton Hautmann was born into a Bavarian dynasty of sculptors and painters and trained in Munich before travelling to Italy to complete his education as a sculptor. He settled in Florence in 1849 and established a modest reputation as a sculptor of classical subjects and portrait busts. A decade later, in 1858 or shortly before, he opened a photographic studio specialising in portraits and stereographic views. Hautmann's photographic career was brief, for he died four years later. In the short period that he practised photography Hautmann made more than a hundred stereographic views of Florence and its environs. These portray the city as it appeared in the last months of the Grand Duchy and in the months following the plebiscite of 1861. Most of Hautmann's photographs focus upon subjects identified by Baedeker and by John Murray in his *Handbook for Travellers in Northern Italy* as "*most* worthy of the traveller's attention." Many of Hautmann's photographs teem with activity, recording the bustling, untidy character of daily life in Florence ca 1860; this distinguishes them from the formal, large-format plates produced contemporaneously by the Fratelli Alinari and other major commercial firms.

GRAHAM SMITH

HAWAII

Shipping routes in the north Pacific were established in the 19th century by whaling ships, imperial interests, and the development of trade. Photography followed these oceanic paths to port towns in the Hawaiian Islands. The first successful daguerreotype portraits were made by an itinerant daguerreian from Peru in the winter of 1846–1847. Fernando LeBleu (known in Hawaii as Senor Lebleu), a laundryman and some time daguerreotypist from Lima, arrived in Honolulu in December 1846. He charged residents, eager to have their portraits made, twice as much as the going rate in Lima. Local newspapers reported that LeBleu was the cause of a "daguerreotype mania" that swept through the community.

The Hawaiian Islands (annexed by United States in 1898) are 2500 miles west of California. In 1849, gold brought the frontier of the United States to California

and to the shore of the Hawaiian Islands. By 1850, many men who had gone to California to seek their fortunes, disappointed they turned to other opportunities to earn their living, including apprenticeships in San Francisco daguerreotype studios. Adventurous young men were also drawn across the Pacific by the discovery of gold in Australia in 1851. The more pragmatic adventurers made the voyage with equipment, and a stock of supplies to make daguerreotypes.

Hugo Stangenwald (1829–1899) and Stephen Goodfellow were on their way to Australia when they stopped in the town of Hilo in 1853. They unloaded their daguerreotype equipment and made portraits of American missionary families stationed in Hilo. Receiving recommendations as talented artists and sober minded gentlemen, Stangenwald elected to remain and operated a studio in Honolulu from 1853–1858. Goodfellow continued on to Australia.

In the 19th century photographic studios were primarily located in Honolulu. Photographers traveled to the other islands in the Hawaiian Island chain and set up temporary studios to make portraits and scenic views. Throughout the 19th century, photographers continued to migrate from California to establish studios in the islands. Charles Leander Weed (1824–1903), a well-known California photographer, arrived from San Francisco in March 1865. He set up a studio in Honolulu with his brothers and began making portraits. Like many newly established photographers, he knew it was good business to attract the Hawaiian royal family as clientele. His large studio portraits (17 × 22 inches) of King Kamehameha V and other chiefs, attracted local residents to the Weed Brothers studio to sit for carte-de-visite portraits.

Before coming to the islands, Weed had made mammoth views with wet-collodion plates of Yosemite Valley, California. He was the first experienced landscape photographer to practice in the islands. He traveled around Oahu and to the island of Maui with his mammoth camera and a stereo camera. His photographs document the absorption of traditional Hawaiian communities by the development of sugar plantations. Weed focused on the newly built sugar mills, with tall smoke stacks that dominated the island landscape, pushing aside native houses made from *pili* grass, and taking over traditional taro cultivation. He found it too difficult to photograph the island landscape. Heat, humidity and dust added to the existing challenges of preparing wet-collodion plates. He departed for Hong Kong in December 1865.

Island photographers imported supplies and recruited photographers from the better known San Francisco galleries. James J. Williams (1853–1926), founder of the longest established family photo business in Honolulu, arrived from Sydney in 1880. He had passed through the islands in 1879 from San Francisco where he worked for photographers I.W. Taber and Jacob Shew. In Honolulu, he worked in the studio of Menzies Dickson (ca. 1840–1891), buying this business in 1882.

Williams not only had a thriving portrait business, he was also actively involved in promoting the islands through a variety of publications and exhibitions. Visitor promotion provided a larger market for his images. He prepared photo displays and albums for expositions and displays in hotels, steamship and railway stations throughout the American west and in Australia. He published *Tourists' Guide* (1882), and in 1888 he established a monthly magazine, *Paradise of the Pacific*. Williams felt strongly that visitors "want to… view something of the native life [with]… a cocoanut tree somewhere in the landscape."

Eighty-six photographers operated Honolulu studios in the 19th century. Most of these studios were owned by American citizens. Horace Crabbe and John Meek, Jr. were the only Native Hawaiians to operate a photo studio (1867–1869). In the 1890s, there was an increase in the number of photo studios operated by Japanese and Chinese residents, reflecting the changes in the island population due to imported labor for sugar plantations. Japanese photographers would often apprentice in a Honolulu studio and then establish studios near rural communities with large sugar plantations.

European and American government interests, dominating global trade routes, led to sponsored scientific expeditions to chart navigational routes and document Pacific island countries. Germany, Britain and the United States maintained a regular circuit of touring naval ships to support their interests in the north Pacific. In 1874–1875 two British scientific expeditions that visited the islands were accompanied by photographers. Edwin Myers and astronomer J.W. Nichols spent three months in the islands making observations and photographing the transit of Venus in December 1874. Although their photographs of the transit were not successful Myers made some of the earliest known photographs of hula performers. Due to the influence of the American missionaries, hula was seldom performed publicly. Princess Ruth Keeliokalani, a high ranking chief, brought the hula group to honor the visiting scientists. The following year in July 1875, the British oceanographic survey ship, *Challenger*, arrived in Honolulu from Japan. An official photographer was part of the crew, and special dry-collodion plates were prepared in London for the voyage.

For Native Hawaiians, making fun at the expense of foreigners' ignorance and arrogance was at times difficult to resist. When another group of British scientists came through the Hawaiian Islands in 1882 on their return from observing the transit of Venus in the north Pacific, they went sightseeing in Hilo: "We found a party of ladies at the top of the cliff dressed in Hawai-

ian costume, and one of our party asked permission to photograph them as they made a picturesque group. They replied in the native language, and as it was supposed they could not speak English we were rather free with our remarks." Upon returning to Hilo they met the King, Kalakaua, who had just arrived from Honolulu. Having heard of their photographic outing, he asked for a copy of the picture as his sister-in-law was part of the group. "To our horror we learnt that these ladies had understood our conversation."

Images of the islands increased with the availability of commercially prepared dry plate negatives. The local amateur photography society, the Hawaiian Camera Club (1889–1893), was open to photographers throughout the islands, as well as to visitors. Danish sugar mill engineer, Christian J. Hedemann (1852–1932), was instrumental in founding the organization. A photograph of the club members, made with the aid of magnesium flash, was taken in 1889 with the assistance of a British naval officer, Lieutenant Pears. Pears also photographed a musical gathering with Robert Louis Stevenson, his family and friends at Waikiki.

The reigning monarch, Liliuokalani, was overthrown by American business interests in 1893 and an interim government was established. The U.S. annexed the Hawaiian Islands in1898. Earlier that year, U.S. military recruits came through Honolulu on their way to fight the Spanish-American war in the Philippines. The military build up in the islands provided a significant market for picture postcards. Images of Hawaiian women posed as "scantily dressed hula girls," and men casting fishing nets became a commodity in expanding the islands' tourist economy.

Lynn Ann Davis

See also: Weed, Charles Leander; and Dry Plate Negatives: Non-Gelatine, Including Dry Collodion.

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HAWARDEN, VISCOUNTESS CLEMENTINA ELPHINSTONE (1822–1865)

British photographer

Viscountess Clementina Elphinstone Hawarden (nee Fleeming) was born at Cumbernauld, her family's estate near Glasgow, Scotland on June 1, 1822. Her father Charles Elphinstone Fleeming was an Admiral in the Royal British Navy who met and married Hawarden's mother Catalina Paulina Alessandro, originally of Cádiz, Spain, while stationed in Spain and Portugal in 1816. Her mother's Spanish, Roman Catholic identity has caused some scholars to forge links between the photographer's work and that of religiously themed Spanish Old Master paintings.

Educated at home with her sisters, Hawarden studied the primarily "feminine" subjects of languages, music, the visual arts, needlework and literature until the fall of 1841, when she and her mother and sisters, in the company of her uncle Mountstuart Elphinstone, traveled to Rome after Admiral Fleeming's death. Before settling in Rome, the party sojourned in Florence, where Hawarden was particularly taken with the Renaissance painting collections at the Pitti Palace. Little is known of her daily excursions in Rome, but it is likely that she visited the major art and architectural attractions and experienced the lively masquerading of the carnival season while in residence. This respite in Italy perhaps colored Hawarden's later photographic choices. Careful study of Renaissance painting compositions and the theatricality of carnival may have inspired the harmonious figural relationships and creative role playing characteristic of her mature work.

The Fleemings moved to London in 1842, where Hawarden married Cornwallis Maude in 1845, much to the displeasure of the Hawarden family who were aristocratic Protestant landlords in Ireland and believed their son to be marrying below his social rank. The couple lived in upper-class circumstances in London for the first twelve years of their marriage, during which time Hawarden was often pregnant. She gave birth to ten children, many of them her future photographic models, in her lifetime and was survived by eight of them, seven daughters and one son.

Hawarden, Lady Clementia.
Photographic Study.
The Metropolitan Museum of Art, Gilman Collection, Purchase, Harriette and Noel Levine Gift, 2005 (2005.100.23) Image © The Metropolitan Museum of Art.

Life changed dramatically for the family after the death of Maude's father in 1856, at which time he inherited the large family estate Dundrum in County Tipperary, Ireland and ascended to the rank of 4th Viscount Hawarden. Now secure in the ranks of the Britain's wealthiest landowners, the family moved to Dundrum in 1857 where the time, money and space afforded by their new position in society relieved Hawarden from many of her domestic duties and allowed her to begin taking photographs.

Hawarden's earliest photographs were landscape views of the grounds at Dundrum, portraits of the estate's laborers and costume pieces of family members posed as laborers taken with a stereoscopic camera. For the most part, these early pieces are artistically derivative and were not exhibited during her lifetime, yet they demonstrate Hawarden's knowledge of both art history and modes of art photography. The depictions of laborers at Dundrum, posing with their gardening and farm implements recall earthy Dutch baroque genre paintings and the costume pieces that artificially echo these more naturalistic photographs are reminiscent of Thomas Gainsborough's eighteenth-century fancy pictures as well as contemporary Henry Peach Robinson's ambitiously contrived narrative tableaux. From the beginning, then, Hawarden positioned herself within the second generation of amateur art photographers including such figures as Lewis Carroll (Charles Lutwidge Dodgson) and Julia Margaret Cameron.

In 1859 the family took up residence at 5 Princes Garden in the South Kensington section of London. It is in this house that Hawarden spent the remainder of her short life and developed her mature photographic style, converting the second floor of the house, with

its distinctive architectural details and grey wallpaper with gold stars, into a suite of photographic studios and using her children as models. Isabella Grace, Clementina and Florence Elizabeth appear most frequently in Hawarden's "Photographic Studies" and "Studies from Life," which she produced between 1859 and 1864 and exhibited at the Photographic Society of London beginning in 1863. It may have been one of these daughters, or Hawarden herself, who painstakingly pasted almost 800 of these photographs into the albums from which they were torn when bequeathed to the Victoria and Albert Museum by a member of the family in 1939, accounting for their irregular shapes, curled edges and scarred surfaces. Although the Victoria and Albert Museum is the primary repository for Hawarden's photographs, the National Museum of Photography, Film and Television, the J. Paul Getty Museum, and the Musee d'Orsay in Paris also own pieces.

Despite their physical state, which has been greatly ameliorated by conservation efforts, the romantic photographs made at 5 Princes Gate maintain their aesthetic and psychological power due to their well-balanced compositions, suggestive coming of age narratives and imaginative variations on a single theme. In the "Studies from Life," Hawarden's daughters are depicted in a variety of repeated tableaux often dressed in costume, interacting with such evocative props as mirrors and orientalist cabinets and playing theatricalized feminine roles. The figures are often pushed into corners and draped over one another creating a close, claustrophobic and intimate atmosphere that offers the viewer a rare glimpse into the inner lives of upper class Victorian girls and women confined to the domestic sphere by their gender and class.

Hawarden exhibited a selection of "Studies from Life" at the Photographic Society of London in 1863, where she was awarded a silver medal for the best contribution by an amateur and was elected to be a member of the society, with Oscar Rejlander perhaps serving as her sponsor, the same year. She showed her work at this venue again in 1864 and won another silver medal for composition. The only arena in which she sold her work was for charity at the Grand Fete and Bazaar. . . in Aid of the Building Fund of the Female School of Art which was held between June 23 and 25, 1864. Lewis Carroll bought five of Hawarden's photographs at this time.

Hawarden died suddenly of pneumonia early in 1865 and was eulogized by Rejlander in the *British Journal of Photography*, who believed that in her work "she aimed at elegant and, if possible, idealized truth." Her work was shown posthumously at the Dublin International Exhibition in 1865 and not only influenced such contemporaries as Lewis Carroll, but such celebrated contemporary photographers as Sally Mann.

KIMBERLY RHODES

Biography

Viscountess Clementina Elphinstone Hawarden (nee Fleeming) was born at Cumbernauld, her family's estate near Glasgow, Scotland on June 1, 1822. Her father Charles Elphinstone Fleeming was an Admiral in the Royal British Navy who married Hawarden's mother Catalina Paulina Alessandro, originally of Cádiz, Spain in 1816. After Admiral Fleeming's death in 1841 the family traveled to Italy and in 1842 settled in London. Hawarden married Cornwallis Maude, later 4th Viscount Hawarden, in 1845 and had ten children with him. Her photographic career began in 1857 at the Hawarden's Irish estate and continued until her untimely death in London in 1865. Her work was shown and won awards in 1863 and 1864 at the Photographic Society of London and exhibited posthumously at the 1865 Dublin International Exhibition.

See also: Robinson, Henry Peach; Dodgson, Charles Lutwidge; and Cameron Julia Margaret.

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HAYNES, FRANK JAY (1853–1921)

American photographer

Frank Jay Haynes was born on October 28, 1853 in Saline, Michigan. He learned photography between 1874–1876 from two Wisconsin photographers, S.C. Graham (Beaver Dam) and "Doctor" William H. Lockwood (Ripon). Haynes was a prolific, visionary photographer who documented the settlement of the American West by railroad development and displacement of the Native population. He photographed over vast distances as the Northern Pacific Railroad's (NPRR) photographer (1876–1905), traveling as far as Alaska

Haynes, Frank Jay. Old Faithful Geyser.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

in 1891 to help boost its fledgling tourist industry. In 1881 the Canadian Pacific Railway Company hired him to photograph construction of its line. While still engaged as the NPRR's photographer, he also obtained a photographic concession in Yellowstone National Park (1884–1916). Between 1885–1905 Haynes had the use of a special Pullman Palace Car, equipped as a mobile photo studio. His wife, Lily V. Snyder (m. 1878), managed the darkroom and business in Fargo, North Dakota, between 1879–1889. Haynes relocated from Fargo in 1889 to St. Paul, Minnesota, where he remained until his death on March 10, 1921. Haynes worked in both stereograph and single-lens formats up to at least 8 × 10 inch glass negatives. His negatives, business and personal records are jointly preserved by the Montana Historical Society and Montana State University.

David Mattison

HEADINGLEY, ADOLPHE SMITH (1846–1924)

English photographer

The bringing together of the photographer John Thomson and the left-wing political writer and activist Adolphe Smith Headingley to work on the project which resulted in *Street Life in London* (1877–78), was a logical progression from the collaboration between Richard Beard and Henry Mayhew more than two decades earlier on Mayhew's study of *London Labour and the London Poor.*

Headingley, who wrote under the name of Adolphe Smith, was relatively unknown when he and Thomson collaborated on *Street Life* and the pairing was an inspired one. Both men had sympathy towards the living and working conditions of their subjects. Smith wrote twenty-four of the essays, to Thomson's twelve, and his texts are generally more socially contextualised and fact-filled than Thomson's.

Smith would later make a name for himself as a political writer with an evangelical reforming zeal. To Smith is also credited the marrying of the words of Irish journalist Jim Connell's 1889 song *The Red Flag*, official anthem of the British Labour Party, with the traditional tune *Tannenbaum*, or *Maryland* instead of *The White Cockade*, the old Jacobite tune to which Connell had originally set the words.

From 1886 until 1905, he served as an interpreter at successive International Trades Union Congresses.

John Hannavy

HEID, HERMANN (1834–1891)

Austrian photographer, manufacturer, and publisher

Hermann Heid was born on 17 December 1834 in Darmstadt (Germany, at that time the residence of the Grand Duchy of Hessen darmstadt). He was a chemist and had already attained a doctorate when he started his career in photography, which led to the creation of the private technical school of Julius Schnauss I in Jena by 1855, then in 1861 to the studios of Emil of the Rabending in Vienna. Consequently he developed into one of the most versatile photographers in Austria. In 1864 at the first exhibition of the photographic society in Vienna, he still predominantly showed as a coworker of Rabending Portraets. However, from today's view his architectural and industrial photographs (plants of the Semmeringbahn, quarries of the Viennese building firm, Danube bridges, large-scale building sites of the Viennese struggle race) are impressive. Heid published the majority of its photographs in his own publishing house. Its painter studies appeared successfully also, with Adolphe Giraudon in Paris (frequently wrongly attributed at Louis Igout). Since the mid-1860s owner of studios in Vienna and Budapest, in 1875 he entered additionally into the production of photographic materials, first the production of collodio-wool (starting from 1875), then from gel drying plates (starting from 1880).

Maren Groening

Biography

Hermann Heid was born on 17 December 1834 in Darmstadt (Germany). He studied chemistry in Gießen and Heidelberg. After graduation he studied photography at the technical school of Julius Schnauss in Jena, then moved to Austria and worked in Vienna as a technical manager with Emil Rabending. A few years later he created a company, which opened an additional local branch in Pest (today a quarter of Budapest) around 1865/1866 with Ferdinand Ronninger. Their line was taken over in 1867 by Gyoergy Kloesz, previously coworker of the Viennese of principal firm. The enterprise had traded since 1874 under "Dr. Heid, photographic-artistic institute." Since 1875 Heid had in addition his own production of collodio-wool, and since 1880 of gel drying plates. In 1861 he was among the first members of the photographic society, and in 1882 promoted the establishment of the association of photographic coworkers to Vienna. Heid took part in many larger national and international exhibitions (1864, 1875, 1881 exhibitions of the photographic society in Vienna; 1865–7. Exhibition of the Société française de photography; 1868 exhibition Hamburg photographic association; 1871 opening exhibition in the new building of the Austrian museum for art and industry; 1873 Viennese world exhibition; 1878 Paris world exhibition; 1891 international exhibition of artistic photographs in the Austrian museum for art and industry).

Collections that possess copies of his photography include: in Vienna, Vienna museum; Technical museum Vienna; Photo collection of the Albertina (continuous loans of the higher graphic federal bundes-Lehr and laboratory); Museum for applied art. In Berlin, University of the arts Berlin, university archives. In Budapest, Historical photo archives of the Hungarian national museum. In Paris, Bibliothèque national de France, Estampes.

See also: Austro Hungarian Empire, excluding Hungary; Architecture photography; Industrial photography; Artist studies

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HELIOGRAVURE

Name given by Nicéphore Niépce (1765–1833), in France, to the first photomechanical process by which reproductions of drawings and engravings could be made. Beginning in 1822, he succeeded in making copies of images by contact printing documents on thin layers of asphalt coated on glass, stone and later on copper and pewter.

In 1822, Niépce made a successful reproduction—a portrait of Pope Pius VII—on glass. No acid etching was used at the time. The following year he experimented on stone, with the help of a lithographer in Dijon. In 1825 he succeeded in exposing and engraving a copper plate. This was the forerunner of photogravure as we know it today.

Niépce has long been recognized as the inventor of the first photographic process capable of producing a permanent photographic image. His oldest extant *camera made* photograph was made in the summer of 1827 (Marignier, 1999) and is now in the Harry Ransom Center at the University of Texas, U.S.A. This photograph, however, is not the oldest extant *photographically produced* image.

Some years ago the well-known Paris collector and historian André Jammes had the opportunity to acquire an unassuming reproduction of a 17th century Flemish print together with an extensive series of autograph manuscript letters by Joseph Nicéphore Niépce and his son Isidore (1795–1868). The correspondence included a detailed description of the processes with which Niépce eventually achieved his historic discovery. The date of this heliogravure was 1825. On March 21st, 2002, this photomechanical reproduction was sold to an anonymous telephone bidder at a Sotheby's auction in Paris for nearly half a million euros. The price was relatively low because the French government had made it clear that the print was considered a National Treasure and would never be allowed to leave France. After the sale the French National Library used its right of preemption and acquired the print for the cost of the highest bid.

The term *heliogravure* referred originally to the *asphalt* or *bitumen* process. For a brief period after 1839 several experimenters tried to obtain printing plates from etched daguerreotypes but this never proved viable. Niepce de Saint-Victor (1805–1870), the cousin of Nicéphone Niépce, resumed the latter's experiments in 1853 but could only succeed in reproducing line illustrations. Many years later, in 1883, he presented to the public heliogravures with a full scale of tones, made from photographic negatives and printed on steel plates with the help of an intaglio press.

The secret to reproducing the tonal elements came from the old aquatint etching process invented in the

1760s by J.B. Le Prince (1734–1784). With this printmaking process a full scale of tone is obtained by etching a multitude of extremely small pockmarks in a random manner on the printing plate. This is achieved by sprinkling the metal plate with resin particles in a specially designed dustbox. When the plate is heated the particles adhere to it and create minute areas of grain. The plate is then placed into an acid bath that eats into the exposed areas of metal. The design on the plate is developed and the gradations of tone are achieved by repeated bitings of the plate. In the first rebiting, all the areas intended to be in the lightest tone, are "stopped out" or covered with an acid resisting varnish, and the plate is again immersed in the acid bath. The process is repeated until a full scale of tone is obtained, the darkest tone being those that are etched the longest and deepest.

Niepce de Saint-Victor had documented the use of the aquatint grain in his *Traité Pratique de Gravure Héliographique* (Paris 1856, 44). The idea was also exploited by Paul Pretsch and Karl Klic, in their work on photogalvanography and photogravure, among others.

Among the most successful héliograveurs we must mention the work of Charles Nègre (1820–1880) who was considered by his contemporaries to be the first to obtain truly remarkable results with his version of the asphalt process. He used the process to produce intaglio steel plates for a monograph on Chartres' Cathedral, with which he won the highest rewards offered at the Exposition Universelle of 1855. Although Nègre used "officially" the bitumen process with an aquatint grain, he probably utilized dichromated gelatin as in the photogravure process for his later work. Nègre always worked alone and never accepted students, so his techniques were never fully understood. Nègre also experimented along the lines of Pretsch's photogalvanography process.

According to Louis-Philippe Clerc, Edouard Baldus (1813–1889), Garnier & Salmon and Charles Nègre used a variant of the aquatint technique where the printing plate was etched in multiple stages, a process used in some Paris printing plants up until the 1920s.

LUIS NADEAU

See also: Goupil & Cie; Klič, Karel Vaclav; and Photogravure.

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HELMHOLTZ, HERMANN LUDWIG FERDINAND VON (1821–1894)

German scientist

Hermann von Helmholtz was born on 31 August in Potsdam, Germany. His father, Ferdinand Julius Helmholtz, had served in the Prussian army fighting against Napoleon then, having a good university education, he taught philology and philosophy at Potsdam Gymnasium. It was a poorly paid job and Hermann, the eldest of four children, was brought up in financially difficult circumstances. Ferdinand was artistic and his influence meant that Hermann grew up having a passion for music and painting. Hermann's mother Caroline Helmholtz, the daughter of an artillery officer, was a calm person who also strongly influenced his character.

Hermann attended Potsdam Gymnasium where his father taught. He was interested in physics and would have liked to have studied that subject at university but the family's financial position meant that was only possible with a scholarship. Hermann's father persuaded him to study medicine which was supported with government scholarships. In 1838 Helmholtz entered the Royal Friedrich-Wilhelm Institute of Medicine and Surgery in Berlin. The scholarship he received had strings attached, however, committing him to ten years as a doctor in the Prussian army after graduating. During the medical course he also attended courses in chemis-

try and physiology at the University of Berlin and read many mathematics and philosophy books. His began work on his dissertation in 1841. He rejected the direction which physiology had been taking, based on vital forces which were not physical in nature, and argued for founding physiology completely on the principles of physics and chemistry.

After graduated from the Medical Institute in 1843 Helmholtz was assigned to a military regiment at Potsdam, but spent all his spare time doing research. He still concentrated on showing that muscle force was derived from chemical and physical principles. In 1847 he published his ideas in an important paper *Über die Erhaltung der Kraft* arguing in favour of the conservation of energy with both philosophical and physical arguments. That philosophical arguments came right up front in this work was typical of all of Helmholtz's contributions. He argued that physical scientists had to conduct experiments to find general laws. The paper is an important contribution and it played a large role in Helmholtz's career for the following year he was released from his obligation to serve as an army doctor so that he could accept the vacant chair of physiology at Königsberg. He married Olga von Velten on 26 August 1849 and settled down to an academic career.

On one hand his career progressed rapidly in Königsberg. He published important work on physiological optics and physiological acoustics. He received great acclaim for his invention of the ophthalmoscope in 1851 and rapidly gained a strong international reputation. In 1852 he published important work on physiological optics with his theory of colour vision. However, experiments which he carried out at this time led him to reject Newton's theory of colour. The paper was rightly criticised by Grassmann and Maxwell. Helmholtz was always prepared to admit his mistakes and indeed he did just this three years later when he published new experimental results showing those of his 1852 paper to be incorrect. Helmholtz's theory of colour vision led to Maxwell projecting the first colour photograph.

A visit to Britain in 1853 saw him form an important friendship with William Thomson. However there were problems in Königsberg. Franz Neumann, the professor of physics, was involved in disputes concerning priority with Helmholtz. Also the cold weather in Königsberg had a bad effect on his wife's delicate health. He requested a move and, in 1855, was appointed to the vacant chair of anatomy and physiology in Bonn. In 1856 he published the first volume of his *Handbook of physiological optics*, then in 1858 he published an important paper in *Crelle's Journal* on the motion of a perfect fluid. However Helmholtz had become unhappy with his new position in Bonn. Part of the problem was that complaints had been made to the Minister of Education that his lectures on anatomy were incompetent. Helmholtz reacted strongly to these criticisms which, he felt, were made by traditionalists who did not understand his new mechanical approach to the subject. It was a somewhat strange position for Helmholtz to be in, for he had the reputation of a leading world scientist. Offered the chair in Heidelberg in 1857, he did not accept it at once however. When further sweeteners were put forward in 1858 to entice him to accept, such as the promise of setting up a new Physiology Institute, Helmholtz agreed.

Helmholtz suffered some personal problems. His father died in 1858, then at the end of 1859 his wife, whose health had never been good, died. He was left to bring up two young children and within eighteen months he married Anna von Mohl, the daughter of another professor at Heidelberg, on 16 May 1861. Some of his most important work was carried out while he held this post in Heidelberg. He studied mathematical physics and acoustics producing a major treatise in 1862 which looked at musical theory and the perception of sound. From around 1866 Helmholtz began to move away from physiology and towards physics. When the chair of physics in Berlin became vacant in 1870 he indicated his interest in the position but Kirchhoff was offered the post since he was considered a superior teacher to Helmholtz. However, when Kirchhoff decided not to accept, Helmholtz was in a strong position. He was able to negotiate a high salary as well as having Prussia agree to build a new physics institute under his control in Berlin. In 1871 he took up this post.

A major topic which occupied Helmholtz after his appointment to Berlin was electrodynamics. He discussed with Weber the compatibility of Weber's electrodynamics with the principle of the conservation of energy. In fact the argument was heated and lasted throughout the 1870s. It was an argument which neither really won and the 1880s saw Maxwell's theory accepted. During this period he taught Alfred Stieglitz, who was a major contributor to the history of photography, and Gabriel Lippmann who developed the theory of photographic reproduction of colour. Helmholtz died on 8 September 1894 in Berlin.

JOHN O'CONNOR
EDMUND ROBERTSON

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HENDERSON, ALEXANDER (1831–1913)

Canadian photographer

Alexander Henderson was born in 1831, possibly in Press Castle, near Edinburgh, Scotland. He started photographing as an amateur a few years after emigrating to Montreal, Quebec, in October 1855. Although he opened a portrait studio in Montreal in 1866 or 1867, Henderson's portrait work was not exceptional, and he abandoned portraiture to concentrate on landscape studies in stereo and large-format negatives. He excelled at exquisitely rendered landscapes, particularly winter scenes, which he also self-published beginning in 1865. Henderson received numerous exhibition awards in the 1860s and 1870s. Like his contemporary William Notman, he was widely known outside Canada. The Canadian Pacific Railway Company hired him around 1885 to document construction of its line through British Columbia, and by the early 1890s he was managing its photographic activities. Retired from photography in the late 1890s, Henderson died in Montreal on April 4, 1913. In the early 1950s his grandson disposed of the glass negatives, stored in the basement of his home, as garbage. Only several hundred individual prints and albums survive in the Notman Photographic Archives (McCord Museum, McGill University), the Library and Archives Canada, and other Canadian and British institutions. Henderson was one of four 19th-century Canadian photographers commemorated with a 1989 postage stamp.

David Mattison

HENNEMAN, NICOLAAS (1813–1898)

Dutch photographer in England, assistant to W.H. Fox Talbot

It is unlikely that Nicolaas Henneman would have become a photographer if he had remained in the Netherlands. Before entering the service of William Henry Fox Talbot (1800–1877) at the age of 26, he had shown little creative energy or obvious artistic talent. He did, however, possess an adventurous spirit that took him, via Paris, to England, where he first became Fox Talbot's servant. Fairly soon after, he became Fox Talbot's assistant in the latter's experiments with photography. Talbot taught Henneman to make photogenic drawings and later calotypes and salted paper prints. Henneman also accompanied Fox Talbot on his (photographic) travels through Germany (1842), France (1843) and Scotland (1844).

Fox Talbot showed great faith in Henneman's capacities. In 1844, he made him head of the photographic printing business in Reading that later scholars would call the Reading Establishment. It was one of Fox Talbot's first attempts at making the calotype a commercial success. The intention was for Henneman to produce large quantities of photographs that could be used as book illustration or sold separately. One of the most famous publications for which Henneman's Reading Establishment produced the photographic prints was Talbot's *Pencil of Nature*, which was published in six instalments with a total of 24 plates between 1844 and 1846. Talbot selected these photographs with immense care from his collection of negatives and provided each with accompanying texts that covered the technical, historical and aesthetic aspects of photography. While at Reading, Henneman also produced the prints for Talbot's homage to Sir Walter Scott, *Sun Pictures in Scotland*.

Henneman did not just work for Fox Talbot in Reading, however. John Walter, the editor of *The Times*, for instance, published a small book in 1844 in memory of his daughter Mary Catherine that included a photograph of a marble bust of her taken by Henneman. He also produced a photographic supplement for Sir William Stirling's *Annals of the Artists of Spain* in 1847 and made prints from the negatives of other photographers such as Calvert Richard Jones and George Bridges. Jones and Bridges mostly worked in countries around the Mediterranean and Henneman distributed their photographs to book and print dealers throughout England.

Henneman also toured Reading and its environs with his camera. His photographs give a good impression of what Reading looked like at the time. The printing establishment itself can be seen on two unique photographs from 1846. Taken in the back garden, they fit together to form a panorama. The left-hand photograph, probably taken by Henneman, shows Talbot taking a photograph and an assistant making a reproduction of an engraving. The right-hand photograph, probably taken by Talbot, shows Henneman standing behind the camera in front of a sculpture, with various assistants busy with two racks of the printing frames that were used for printing.

The printing establishment was not a financial success and Talbot decided to close it in 1847. The intended market—print collectors and photographers—turned out to be much too small. Moreover, buyers complained that the photographs faded too quickly.

In 1847, Henneman moved to London, opening a portrait studio on the upper floors of 122 Regent Street, above the instrument makers Newman & Co., which Talbot rented. In his letters to Talbot, Henneman had more than once pointed out that making portraits might prove to be a very lucrative business. While at Reading, Henneman had made portraits of local stationer George Lovejoy and of the author Mary Mitford and her dog Flush (collection of the National Media Museum).

In 1848, Henneman took over control of the studio together with the chemist Thomas Agostine Malone, whom he had met in Reading. While Henneman ran the

studio, Malone spent most of his time experimenting. Unfortunately, very few of the photographs taken by Henneman and Malone remain. The only portrait that can definitely be attributed to them by means of the stamp on the back is one of the painter William Henry Hunt (collection of the *Museum of the History of Science*). The fine pencil screen on the photograph may indicate that Hunt used it to make a self-portrait. It would have pleased Talbot that the photograph has not been retouched. He often complained at the way in which the miniaturists employed by Henneman and Malone ruined the photographs with their heavy retouching. Malone left the studio in 1851 to take up a teaching post at the Royal College of Chemistry, leaving Henneman to carry on alone, under the name of Henneman & Co.

Henneman and Malone took part in the Great Exhibition of 1851. With Talbot's help, Henneman almost landed a significant order from the Royal Commissioners to make the photographs for the jury reports. However, the Commissioners were so disappointed at the quality of the first photographs that Henneman made for them, especially considering the price, that they cancelled the deal. Talbot's intervention failed to prevent the order going to Hugh Owen, Claude-Marie Ferrier, Friedrich von Martens and Robert Bingham.

Henneman enjoyed greater success following the invention by Scott Archer of the wet collodion glass negative in 1851. In 1852, he was one of the first professional photographers to make negatives using this technique. And not without success: the portraits that Henneman made using this technique garnered considerable praise, including a report by Ernest Lacan in the French photography journal *La Lumière* (24 December 1853):

> Ce qui les distingue surtout, c'est une grande finesse de détails, qu'on les croirait obtenues sur ivoire ou sur glace ... Ce qu'il y a de certain, c'est qu'il sait donner à son modèle une expression naturelle, et qu'il éclaire de façon à produire un effet de relief saisissant. (Ernest Lacan, "Revue Photographique. Artistes Anglais. M. Henneman," in *La Lumière*, 3/52 (24 December 1853), 207–208)

The portrait of an old man in a cape, for example, is reminiscent of the portraits that the French photographer Nadar began to make around this time. Because of his grandeur, the man in the portrait was long thought to be the Hungarian freedom fighter Lajos Kosuth, who had previously posed for Henneman in 1851. Another photograph of the same man in profile, however, is labelled as being of a certain Signor Senture. In any case, the daguerreotypes that the American photographers Southworth & Hawes took of Kosuth a year later show an entirely different man.

1853 was a highly successful year for Henneman, with 833 portraits made. That year, a writer for Charles Dickens' magazine *Household Words* described Henneman's studio, in which he witnessed the photographer expertly preparing a glass negative. The English-based Swede Oscar Gustav Rejlander also found his way to 122 Regent Street when he was looking for a good photographer to teach him the art. According to Lacan's description, Henneman had a talent for putting his subjects at ease. As a result, his portraits never seem contrived. This is immediately apparent in his series of photographs of Zulus and earthmen that was exhibited in London in 1853. Despite the frightening situation in which they found themselves, Henneman was nevertheless able to make them adopt a fairly natural pose. A number of these photographs is now in the collection of the *Royal Archives* at Windsor.

After 1853, the number of professional photographers in London grew rapidly. Henneman proved unable to hold his own among competition that was extremely fierce and not always equally fair. In 1858, Talbot secretly paid off many of Henneman's debts. Their ways finally parted when Henneman left with his family for Birmingham to try his luck as an operator. As his last letter to Talbot in 1866 shows, it was not a success:

> I am here in a situation till July. I was obliged to take it as London is overwashed with photographers. They advertise themselves as first rate artists at 30 shilling a week. I do get four pounds here but I am sorry to say it does not suit my health. I am pretty well shut up for 8 hours in a room by stretching my arms out I can touch the walls both ways so I can't call it a room but a closet" (Letter of 30 March 1866, NMeM 1937-5439).

Not long after, Henneman began a second career, as a lodging house keeper in London.

Photographs by Nicolaas Henneman have been preserved in the collections of, among others, Lacock Abbey, the National Media Museum in Bradford, and the Rijksmuseum in Amsterdam.

Saskia Asser

Biography

Nicolaas Henneman was born in Heemskerk in the Netherlands on 8 December 1813. After various adventures he came to England in 1838, entering the service of William Henry Fox Talbot as valet and soon assisting him with his experiments with photography. When Talbot set up a photographic printing establishment in Reading in 1844, he appointed Henneman to run it. At the Reading Establishment, as it later came to be called, Henneman made photographic prints for various clients and publications, including Talbot's *Pencil of Nature* and *Sun Pictures of Scotland* and Sir William Stirling's *Annals of the Artists of Spain.* After the printing establishment was closed in 1847, Talbot helped Henneman set up a portrait studio at 122 Regent Street in London. Later that year, Henneman was appointed "Photographer in Ordinary to

Her Majesty." Until 1851, he worked together with the chemist Thomas Malone, continuing independently under the name of Henneman & Co. until 1858. During the 1860's, Henneman worked as an operator in the studios of photographers such as Napoleon Sarony and Robert White Thrupp in Birmingham. Henneman died on 18 January 1898 at 18 Half Moon Street, London, where he had run a lodging house since around 1872.

See also: Talbot, William Henry Fox.

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HENRY, PAUL (1848–1905) AND PROSPER (1849–1903)

The two brothers, Paul Pierre Henry (1848–1905) and Prosper Mathieu Henry (1849–1903), were born in Nancy a year apart. Paul Pierre was born on August 21, 1848 and his younger brother Prosper Mathieu on December 10, 1849. Coming from a modest family, little is known of their training other than that they completed their elementary studies within the framework of a catholic school. When they finished schooling, each 16 years old, they became employees of the Service Météorologique des Prévisions, which had been recently created at the Observatory of Paris. Quickly, they learned the skills of their astronomical vocation and were passionate about the construction of optics intended for telescopes. While they performed their daily tasks at the Observatory, they developed their research on optics in a workshop that they arranged in their house in Neuilly and later at Montrouge.

In 1871, Charles-Eugene Delaunay, then director of the Observatory, having learned of their work on optics, transferred them from the service of Meteorology to the department of Astronomy in order to continue unfinished work left by the death of the astronomer Jean Chacornac. From 1852, at the Paris Observatory, they were engaged in the production of astronomical charts which, it was hoped, would help in the search for asteroids and small comets. The establishment of such charts involved a genuine tour de force. The observer had to measure the positioning of each star and transfer it by drawing on sheets which were then engraved. In the areas close to the Milky Way, there are 18,000 stars in a portion of five degrees of the celestial vault. With such a concentration of stars, the limits of the ordinary processes of observations were quickly reached. In 1884, the idea came to Paul and Prosper to substitute observations by the naked eye with a method of photographic recording based on that of the American astronomer Pickering who obtained in 1882 a perfectly readable image of the nebula of Orion.

The first results achieved by the Henry brothers were surprising. On certain negatives, one could count 1500 stars that were invisible to the naked eye. The advantages that the delicate plate represented in the development of the celestial charts did not escape those in charge of the observatory for Paris, in particular its new director, the admiral Ernest Mouchez. The utility of the process was not in any doubt: " Using photography, one will be able, to obtain in one hour a Sky chart of the same quality as the ecliptic Chart, which would require several months of an assiduous work by the ordinary processes."

Other observatories considered at the same time the possibility of a photographic chart of the sky. In order to prevent all isolated approaches, Mouchez considered it necessary to found an international scientific collaboration. In 1886, he submitted the photographic chart of the sky for the approval of the Academy of Science, an international Congress. The following year, 15 directors of the selected observatories found themselves in Paris to agree on the methods of its execution. The inaugural speech that Mouchez gave summarized for them the posted ambitions of the project: "It will be a glorious and unforgettable date, as will be unforgettable in the history of Astronomy the imposing work which we want to bequeath to the future generation's work, one which will be able to define as the Inventory exact and as complete as possible of the perceptible universe in the end of the 19th century."

It was however necessary to await the meetings of 1889 and 1891 to reach an agreement among all the observatories. Eighteen of them ultimately held out, those of Greenwich, the Vatican, Catane, Helsingfors, Potsdam, of Oxford, of Paris, Bordeaux, Toulouse,

Algiers, of San Fernando, Tacubaya, of Santiago, of Plata, Rio de Janeiro, of the Cape, of Sydney and finally Melbourne. With these three congresses, several provisions were adopted. They agreed on certain points among which were the dimensions of the objectives, focal distances, sizes of the plates, the maximum size of stars to be recorded, the reproduction of stereotypes intended to fight against the accidental damage, their conservation, as well as the measuring apparatus allowing the examination *a posteriori*.

Despite everything, these provisions and the schedule of conditions of the recommendations discussed was interminable, obliging the majority of the observatories to defer the project. The exorbitant cost of the operation also slowed down the enthusiasm of some of them. On the eve before of the First World War, only the observatories of Paris, Toulouse, and Algiers had partly completed work. At the same time, other astronomical fields of research appeared, relegating the sky chart to the secondary row of concern. Three quarters of a century after its launching, at the General meeting of the International Astronomical Union held in Brighton in 1970, the project of photographic chart of the sky was definitively abandoned. In spite of this failure, never had the affirmation of an official and systematic use of photography been so strong.

The reputation of the Henry brothers, which is not due to any spectacular discovery as it is to scientific logic, finds legitimacy in the decisive part that they played in the establishment of this photographic chart of the Sky and more largely in the history of French astronomical photography.

On July 25, 1903, Prosper, younger of the two brothers, died in a climbing accident that occurred in the climbing station of Pralognan in Savoie. Two years later, January 4, 1905, Paul died in Montrouge on the outskirts of Paris.

DENIS CANGUILHEM

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HENSCHEL, ALBERT (1827–1882)
German-born, Brazilian photographer

Albert (Alberto) Henschel was born in Germany on June 13, 1827, to Helene Henschel and Moritz Henschel, a successful engraver based in Berlin. By the time Albert arrived in Recife, Pernambuco, Brazil, in 1866 together with business partner Karl Heinrich Gutzlaff, he was an experienced photographer. Henschel later opened studios in Bahia, Rio and São Paulo. Wilhelm (Guilherme) Gaensly worked as his assistant at the "Photographia Allemã" studio in Salvador, Bahia. In the early 1870s, Henschel formed a partnership with fellow German Francisco Benque and on December 7, 1874, Henschel & Benque became Photographers to the Imperial House in Rio. Henschel is best known for his cartes-de visite and landscapes taken in Rio de Janeiro Province. Noted for their respectful portrayals of their subjects, his portraits of African and Creole slaves and freedpersons belonged to a series of about 40 taken in Recife, Salvador and Rio. Henschel participated in several Brazilian exhibitions and won a medal of merit at the Vienna Universal Exhibition of 1873. He died in Rio on June 30, 1882. His works are housed at the Leibniz-Institut Für Länderkunde, Leipzig (Germany) and the Emanoel Araújo Collection, the Moreira Salles Institute and the Joaquim Nabuco Foundation (Brazil).

SABRINA GLEDHILL

HENTSCHEL, CARL (1864–1930)
English photographer

Carl Hentschel founded his firm of photo-engravers, designers, electrotypers and stereotypers in 1887 and there were premises in London, Manchester and Liverpool. The firm advertised that it was the largest firm of photo-engravers in the world.

Hentschel was born in Lodz, in Poland on 27th March, 1864 and emigrated to England with his parents at the age of five. He served his apprenticeship with his father and initially worked using the 'photo-on-wood' process.

Hentschel's reputation lies in his invention of the first photomechanical process block to bring about a revolution in half-tone newspaper illustration. However, Hentschel was also involved in book illustration such as the photomechanical reproduction of Aubrey Beardsley's compositions for Oscar Wilde's *Salome* (1894) and those he created of photo-micrographs for Lennox Browne's *Diphtheria and its associates* published in 1895.

Carl Hentschel Colortype Company formed in 1899 and exploited a three-colour printing process based on colour-separation onto monochromatic plates. Beatrix Potter's first book, *Peter Rabbit,* published in 1902, was, at the author's suggestion, printed using this process.

Hentschel was closely linked to the London theatrical world and was founder of the O.P. Club. The character

of William Harris in Jerome K. Jerome's *Three Men in a Boat* (1889) was based on Hentschel.

Hentschel died on Thursday 9th January, 1930.

ANTHONY J. HAMBER

HEPWORTH, THOMAS CRADOCK (1835–1905)

English lecturer and writer, specialist in the optical slide lantern

Fellow of the Chemical Society. Lectured at the Royal Polytechnic, London in the 1870s. Later, as an itinerant lantern lecturer, his subjects included "A Trap to Catch a Sunbeam" (photography) and "The Rontgen Rays." He promoted electric illuminants for slide projection. His articles included 'The Evolution of the Magic Lantern,' in Chambers's Journal, 1897–8. T.C. Hepworth's books included: *Photography for Amateurs: a non-technical manual for the use of all* (1884); *Evening Work for Amateur Photographers* (1890), and two manuals on projection: The Magic Lantern and its Management (1885), and The Book of the Lantern (1888). The latter contained instructions for photographic lantern slide making with both wet and dry plates, coloring photographic transparencies for projection, and "The Hand Camera as an Aid to Lantern Work." T.C. Hepworth's son Cecil Milton Hepworth, also a lanternist, started in the motion picture business in the 1890s and became an important early film producer.

STEPHEN HERBERT

HERING, HENRY & CO. (1814–1893)

Henry Hering was born in St Marylebone, London in 1814, and at an early age was apprenticed to his family's bookselling, publishing and bookbinding business in St Marylebone. He was admitted as a partner in1836, after the retirement of James Hering, and in 1843 went into partnership with Henry Remington as booksellers and print sellers at 153 Regent Street, Westminster, moving to 137 Regent Street in 1844. The partnership was dissolved in 1856, when Hering decided to switch the business wholly to photography.

An advertisement in the Athenaeum at the time of the studio opening, July 12 1856, notes Portraits taken by the collodion process, of all dimensions, from the brooch size to 12 in by 10 in ... Paintings and drawings copied ... out-door photography. Engineers' and builders' works in progress "Impressions taken from photographers' own negatives, either on albumenized or plain paper, or by the Ammonia Nitrate or Sel d'Or process ... Coloured photographs by the best artists ... Extensive variety of photographs—Views of Sebastopol and the Crimea, by Robertson." Landscapes in France ... Views of the churches and colleges of Oxford and Cambridge, Isle of Wight ... Photographs by the most eminent English artists.

Hering's confidence and success in the studio is evident in a further Athenaeum advertisement January 8 1859.

From its long-existing artistic pre-eminence, this establishment offers unique advantages to the nobility and gentry who are desirous of having portraits taken, or oil or water-coloured paintings and drawings copied.

By the early 1860s, Hering was acting as London agent for several prestigious foreign studios, including Alinari, Beato and Bisson Freres.

Hering exhibited at the International Exhibition of 1862 in London, and received an honorary award for artistic excellence in Class XIV (No. 3094). In 1856, he issued part 1 of Henry Taylor' "Photographic memoranda," which was favorably reviewed in the Art Journal December 1856 but which did not progress further. In June 1864, Hering started publication of a serial entitled "The Studio," in monthly parts at 1 guinea each. It ran to 5 parts, each part featuring 4 photographs of eminent contemporary painters in the style of Old Masters. Part 1 included Phillip, Calderon, Faed and Watson. The series was apparently unsuccessful, and ended abruptly; at the same time, Hering disposed of his print business.

In 1863, Hering was involved in a copyright law suit, over photographs of Lord & Lady Canning, taken by an Indian photographer and illegally copyrighted by Hering without permission. In his defense, Hering claimed that he was the official agent for Beato, but that over 400 views in India & China had been pirated and sold illegally.

It is a considerable irony that Hering's main claim to lasting fame in the annals of photographic history derives from photographs not even attributed to him during his lifetime. In the early 1850s, a series of photographic studies of mental patients at the Bethlem Hospital, then situated in South London, were taken at the instance of Dr Hugh Welch Diamond (q.v), himself resident superintendent of the Female Department of the Surrey County Lunatic Asylum. Over fifty of these whole-plate images were made, probably for the private collection of the Medical Superintendent at Bethlem, Sir Charles Hood. There were no case notes, but a series of wood engravings from the photographs were issued in 1858 to accompany articles by Dr John Connolly in the Medical Times & Gazette. These engravings were credited as "from photographs by Dr Diamond," and were still so listed in references almost down to the present day. In the 1970s, when the whole history of early medical photography was being re-examined, it was noticed that most of the mounts from the surviving photographs in the Bethlem archives were in fact credited as "Hering

photo." In their book on the "Diamond photographs, Burrows and Schumacher (see infra) noted 'The series looked like the work of one photographer. Had Hering simply supplied a set of prints from Diamond's originals?" Connolly's articles make no mention of Hering, Diamond being the only named photographer. The English translation of Burrows & Schumacher (1990) includes an extra preface noting that these photographs are now considered to be the work of Hering, in view of the fact that more than half of the mounts are so inscribed. This is considered to outweigh the attribution to Diamond in the Medical Times & Gazette, which must therefore be seen as an error.

Hering's photographs of Bethlem patients can now be classified with those of his French contemporary, G-B Duchenne de Boulogne, whose detailed studies of treatment have an immediacy impossible to obtain from Hering's carefully posed quasi-studio portraits. This is most obviously exhibited in the well-known portrait of Bethlem inmate the painter Richard

Dadd, working on his fairy painting "Contradiction. Oberon and Titania" (c 1856). It is worth

noting that all of Hering's subjects had been confined to Bethlem for violent crimes, which makes it all the more remarkable that he was able to photograph the patients in "before& after" poses.

Hering closed his London studio in 1873, and retired to a mansion on the outskirts of Redhill in Surrey. His business had made him a wealthy man, and he must have been devastated when his wife Eliza died in 1879. Hering caused a considerable local scandal in 1884 when, at the age of 70 he married his 22 year old housekeeper, Louisa. She duly inherited the bulk of his £17432 fortune (more than £¾ million today) on his death at Redhill April 231893; she had run through £13500 of it by the time of her own death in 1909.

The major holding of Hering's mental patient photographs is still held by Bethlem Archives, with smaller collections at the Royal Society of Medicine and the National Media Museum. The National Portrait Gallery has a good collection of his studio work.

David Webb

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HERSCHEL, SIR JOHN FREDERICK WILLIAM, BARONET (1792–1871)

English astronomer and mathematician, photographic inventor, photochemist

J. F. W. Herschel was born on 7 March 1792 at Observatory House in Slough, the only child of the musician and Royal Astronomer Sir William Herschel and Mary Pitt, née Baldwin. Herschel's father, who was born in Germany as Friedrich Wilhelm, had carved himself a niche in the history of astronomy for his discovery of the planet Uranus and for his construction of unprecedentedly large telescopes. As a result, Observatory House was a scientific landmark and it was visited throughout John Herschel's childhood by royalty, gentry and scientists from all parts of the world. Growing up in such a household and under the influence of his renowned father and aunt, the astronomer Caroline Lucretia Herschel, it is hardly surprising that John Herschel acquired his own fame in astronomical and mathematical subjects. But, as he wrote to his wife Margaret in 1841, "Light was my first love!," and it was through this lifelong interest in the properties and vagaries of light that he came to photography.

Herschel's university years at St John's College, Cambridge (1809–1813), were devoted primarily to mathematics. Not only did he carry away the top academic prizes during this time, he was also elected a Fellow of the Royal Society, and co-founded the Analytical Society with Charles Babbage and George Peacock. The Analytical Society succeeded in revolutionizing the teaching of calculus in British universities, adopting Continental notation in place of Sir Isaac Newton's fluxions. Even at this early stage of his career, Herschel's zeal to "leave the world wiser than [he] found it," was already fully formed, and this clearly motivated his approach to photography when that too appeared on his horizon. His brief forays into legal studies and then into an academic career at Cambridge, ended abruptly at the close of 1816 when he settled finally on learning the trade of astronomer as his father's assistant. Herschel's life as a scientist of independent means, in a time when such a profession hardly existed, allowed him the freedom to pursue his personal interests, among them the study of light.

In 1819 and 1820, Herschel published several articles on the action of hyposulphurous acids. His observations would later form the basis of the 'hypo' used commonly

to fix silver-based photographs. At the time, he recorded that among the novelties of these compounds was the singular characteristic of the hyposulphites to dissolve "muriate of silver," that is, silver chloride. This ability would allow a photographer to wash the unexposed silver from the emulsion of the photograph, rendering it insensible to further exposure. When it became clear early in 1839 that this "washing out" method differed from Talbot's "stabilizing," he tested both, finding Talbot's simpler, but his own more dependable.

Like many active scientists of the early 19th century, Herschel was intent on discovering what light really was, and whether it moved in waves or in particles. Although noone of his generation, or indeed the following generation, would formulate an answer this question, Herschel believed light travelled in waves, that is, he believed in undulatory theory and not particle theory. He also believed, and would use photography to prove, that the visible part of the spectrum was a small portion of the actual spectrum. In 1819 Herschel began an exhaustive study of the nature of polarized light. Not only did he intend to correctly categorize the various phenomena, he also intended to clarify the terminology used by British scientists who studied light. He was joined in this endeavor by Sir David Brewster. Herschel's contributions to the language of photography, which are discussed below, can be seen as a part of this much larger endeavor.

The late 1820s were a busy time for Herschel, who was rapidly attaining a level of fame that would surpass his father's. In 1827 he wrote his essay on Light for the Encyclopaedia Metropolitana. The essay, which was published along with one on Chemistry in 1830, quickly attained the status of a classic and set out many of the principles on which he would conduct his photographic investigations. In 1828 he married Margaret Brodie Stewart, beginning a long and happy domestic, artistic and intellectual partnership that was, by all accounts, one of the great joys of his life. And finally, to complete the decade, he published his A Preliminary Discourse on the Study of Natural Philosophy, in which he prescribed methods for the successful prosecution of experimental science. In this treatise, which influenced Charles Darwin and John Stuart Mill among many others, Herschel put forward a system for organizing scientific enquiry, in this way furthering it. The organizing principles he formulated would govern his behavior towards photography, which he viewed as a most fascinating branch of science. One of the most striking peculiarities of the book is the prominent place given to scientific nomenclature as a crucial componant for molding a particular field of study into an organized science. Herschel applied these standards to photography as well.

A series of chemical experiments in the Spring of 1831 on the light sensitivity of certain salts of platinum had Herschel most of the way to inventing a photographic process. Like Johann Heinrich Shulze, Herschel cut masks and allowed the action of light to pattern the platina solution through the masks. He shared these pretty experiments with his friends David Brewster, Charles Babbage, and William Henry Fox Talbot. Although nothing in the way of photography came directly from this demonstration, Herschel recalled it immediately in 1839.

Photography was announced to the public at the very height of Herschel's career. He had just returned from four years in South Africa, having completed an examination of the skies of the Southern Hemisphere, and had been reluctantly raised to a baronetcy. Herschel learned of the announcement of the Daguerreotype on 22 January, and of Talbot's competing process within the space of a few days. By the 30th, needing no help from either inventor, he had made and fixed his own photographs on paper, envisioning even the necessary steps to reverse the tones of the original, converting the negative image into a positive.

Herschel did not coin the name 'photography' for the new art. Both Charles Wheatstone (in a letter to Talbot, 2 February 1839) and Johann von Mädler (25 February, Vossische Zeitung) had already suggested its use. It is possible that several early experimenters also thought the term appropriate. There is some evidence that Hercules Florence, in Brazil had called his own experiments of the 1830s by name photographie. What Herschel did was to endorse this name, and encourage its adoption within the scientific community. Herschel employed 'photography' in a paper titled 'Note on the Art of Photography' presented before the Royal Society on 14 March 1839, but he withdrew the paper from publication. In 1979, Larry J. Schaaf rediscovered this paper, enabling us to understand that Herschel's motives were not only to define the realm of what 'photography' would be, but to exhibit a photograph produced in experiment. This use of photography as a piece of demonstrative scientific evidence encouraged his scientific audience to do the same. He went on in 1840 to introduce the titles "positive" and "negative,"' without which we would still speak of "originals" and "transfers," or "impressions" and "re-reversals." In 1860 he also appropriated 'snap-shot' from its hunting roots, to designate an "instant" picture.

It has often been noted that Herschel appeared quite indifferent to making photographs in camera. Many reasons could be given for this tendency, but the two principal ones are his facility with the camera lucida in taking sketches, and also his concentration on making photochemical experiments, many of which required more exposure than a camera of the time could conveniently supply. Nonetheless he did success in making a camera image of his father's 40-foot reflecting telescope. This was no ordinary camera image, either. It was cir-

cular glass negative 10 centimeters in diameter, made by percipitating muriate of silver directly onto the glass, and then washing it with a further wash of silver nitrate. Herschel marvelled at the clarity and sharpness of the image, calling the result a "glass daguerreotype." The image could be blackened or varnished to enable it to be viewed as a positive, or "if the varnish be omitted there seems to be no reason why impressions should not be taken from it ad infinitum."

Although Herschel's time was increasingly monopolized by the completion of his astronomical catalogues, he continued to follow up his photochemical experiments for the next three years. A great part of these experiments were made with organic compounds, usually the juice distilled from the petals of flowers. This particular vein of research was motivated by his firm belief that the complete spectrum, color for color, could be reproduced photochemically. Although Herschel ultimately failed to achieve a workable full- or even multi-colored process, he saw that photography's future quite clearly lay in this direction. In the midst of these color trials, however, he began a much more fruitful line of enquiry.

Early in 1842, the electro-chemist Alfred Smee sent Herschel a quantity of the bright red compound now called potassium ferricyanide. While testing the sensitivity of this substance under the light of the spectrum, Herschel noted that it acted with much the same sensitivity as guaiacum, and when thrown into water, it became a deep prussian blue. Smee suggested two further compounds, Ammonio Citrate and Ammonio Tartrate of Iron, and by June of 1842, Herschel had developed both the Chrysotype, named for its use of gold "to bring about the dormant picture…," and the Cyanotype, his most practical and enduring process. ("On the Action of the Rays of the Solar Spectrum on Vegetable Colours, and on Some New Photographic Processes" in *Philosophical Transactions of the Royal Society of London*, vol. 132, 1842, 181–214.)

Herschel's 16 June 1842 paper presented his experiments not as independant inventions of processes, but as a series of observations on the basic principles of photographic chemical action. Although he describes his many experiments, both organic and metallic, he refrains from naming them or presenting wholly functional working processes. It would only be in November of 1842 that he would systematically describe the working details of his processes. ("On Certain Improvements on Photographic Processes Described in a Former Communication, and on the Parathermic Rays of the Solar Spectrum" in *Philosophical Transactions of the Royal Society of London*, vol. 133, 1843, 1–6.)

Having contributed, thus, in tens of small ways to the progress of photography, Herschel's experiments on photographic subjects came to a halt in 1843, victims of his astronomical writing and public duties. But his interest in photography never ceased. Anna Atkins, a close friend of the Herschel family, immediately took up the cyanotype in her self-publishing effort in Botony. Julia Margaret Cameron declared that Sir John was 'her first teacher,' and immortalized him in a series of portraits. In 1845 Herschel published his final contribution to photographic research, an observation of what he called 'epipolic dispersion.' George Gabrielle Stokes would later rename this phenomenon 'flourescence,' the study of which led directly to radiation photography of all types. When Sir John Herschel died in 1871, he was mourned by a nation, who buried him near Sir Isaac Newton in Westminster Abbey.

KELLEY WILDER

Biography

John Frederick William Herschel was born 7 March 1792 at Observatory House in Slough, near London. At the age of 24, having already been elected Member of the Royal Society (1813), he became assistant to his father, the astronomer Sir William Herschel, and dedicated his life to finishing the monumental Herschel star catalogues. Not only was he respected as an astonomer and mathematician, he contributed papers on geology, meterology, chemistry, botony, photography, and educational reform. He was a talented musician, linguist and draughtsman, leaving hundreds of camera lucida drawings. Herschel married Margaret Brodie née Stewart in 1828, and they had twelve children. In 1821 and 1847 he was awarded the Copley Medal of the Royal Society (RS). Herschel was a founding member, and served as President of the Royal Astronomical Society. He was, from 1824–1827 Secretary of the RS, and from 1827–1829; 1838–1840; 1847–1848; 1851–1852 Vice President of the RS. In 1831 he was knighted, and in 1838 made a baronet. He served as Master of the Mint (1850–1855), as Sir Isaac Newton had before him. Herschel was the first to publicly utilize photography's potential as a scientific tool in the study of light, and he invented numerous photographic processes, among them the cyanotype and chrysotype in 1842. Herschel died on 11 May 1871 at his house Collingwood, in the village of Hawkhurst, Kent, where he had moved in 1840.

See also: Atkins, Anna; Cameron, Julia Margaret; Daguerre, Louis-Jacques-Mandé; Hunt, Robert; Talbot, William Henry Fox; and Cyanotype.

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HESLER, ALEXANDER (1823–1895)
American photographer

Alexander Hesler is best known for the photographs he took of Abraham Lincoln before Lincoln became president of the United States. Born in Canada in July, 1823, Hesler learned the daguerreotype process in 1847, and eventually settled in Galena, Ill., and opened a gallery in 1850.

He moved to Dubuque, Iowa, in November 1850, but returned to Galena five months later and soon established himself among the national fraternity of daguerreian artists, receiving several mentions in the trade journals of the time.

In August, 1851, Hesler took daguerreotypes of Minnehaha Falls that inspired Longfellow's poem, *Hiawatha*. In 1853, Hesler exhibited a daguerreian panorama of Galena and three views of St. Anthony Falls at the Crystal Palace exhibition in New York City and received a medal.

In 1855, he moved to Chicago, and remained there until after the Great Fire of 1871, when he moved to Evanston. He moved back to Chicago in 1880.

Hesler's photograph of Lincoln with tousled hair, taken in Chicago on Feb. 28, 1857, is the second earliest known image of the future president. Hesler also made four images of Lincoln in Springfield, Ill, on June 3, 1860 after he had become the Republican nominee for president.

BOB ZELLER

HETZER, WILLIAM (active 1850s–1860s)
German photographer

Hetzer was a German photographer who arrived in Sydney with his wife Thekla aboard the *Balmoral* in 1850, not long after setting up a studio at 15 Hunter St. He worked initially with calotypes, one of the few professional photographers in Australia to do so and he produced finely hand coloured portraits of Sir Thomas Mitchell and one of his sons. In 1858 Hetzer published by subscription a set of 36 stereo views of Sydney and environs. More were released the following year including aborigines at Camden Park and several panoramas of Sydney bringing to total number of views to 100.

He exhibited at the 1861 Sydney Exhibition and at the 1862 London International Exhibition, gaining an honourable mention at the latter. Hetzer excelled in producing quality cartes de visite portraiture from his studio "W. Hetzer's Photographic Gallery" situated at 287 George St, Sydney. His wife Thekla worked as his able assistant. Hetzer was engaged by the New South Wales commissioners to photograph various landmarks in Sydney, Newcastle, Singleton, Picton and Menangle for the 1867 Paris Universal Exhibition. In March 1867 an auction of the studio equipment was announced and that Hetzer and his wife were to leave for England. The studio and negatives were sold to fellow German John Degotardi.

MARCEL SAFIER

Holdings: Mitchell Library, Sydney; Macleay Museum, University of Sydney; National Library of Australia, Canberra.

HIGHLEY, SAMUEL (1825–1900)
English photographer, author, and studio owner

Samuel Highley was born into the book trade business. His father ran John Murray's bookselling business after Murray's death in 1793, and from 1795 in formal partnership with Murray's son, until 1803 when the partnership was dissolved. Highley was later joined by his son, Samuel junior, and the business moved to 32 Fleet Street.

Highley junior was a bookseller, publisher and dealer in scientific and medical instruments and specimens and he was an agent for the Royal College of Surgeons. His interests ranged from photography, to microscopy, mineralogy and chemistry and he wrote extensively on all these subjects, corresponding, for example, with Henry Fox Talbot on microscopy in 1853. He was Secretary of the Photographic Society in 1857 and was an assistant editor of the *British Journal of Photography* for nearly

forty years. He edited the Journal's *Photographic Almanac* for 1861 and 1862. He became a Fellow of the Chemical Society in 1854.

Optical projection was a particular interest of Highley and he is credited as amongst the first to design a biunial, or double lantern with two projecting lenses mounted vertically above one another, with a dissolving tap for the exhibition of dissolving views and he was an accomplished maker of photographic lantern slides. He designed a lantern for the projection of photo-micrographs with a paper on the subject being read before the Society of Arts in January 1863. He manufactured optical lanterns as part of his business as a manufacturing optician.

Highley wrote on photography from the early 1850s to the late 1870s after which he seems to have had no further public involvement photography and his obituary in the 1902 *Almanac* stated he had: 'long since passed out of the sight and mind of the photographic world.' He died in Stutton's Hospital, Charterhouse, London.

MICHAEL PRITCHARD

HIKOMA, UENO; See UENO HIKOMA

HILDITCH, GEORGE (1803–1857)
English painter and photographer

An early user of the collodion process and a calotypist, George Hilditich, came to photography after establishing himself as a painter.

He was born in 1803 in the City of London to Mildred and George Hilditch, a city silk mercer. As a boy, Hilditch spent the summers in the rural surroundings of Richmond-upon-Thames, London. It was here that he became a pupil of the painter Thomas Christopher Hofland (1778–1843) of Twickenham. Later he attended the Royal Academy schools and in 1823 had his first painting selected for the Royal Academy summer exhibition. He was awarded a gold medal for an original landscape in oils by the Society of Arts, Manufactures and Commerce, which actively encouraged fine arts skills in young people. It inspired the first of many summer painting tours to picturesque destinations in Britain and later to France, Germany and Italy and he established himself as a regular exhibitor at the Royal Academy, the Royal Society of British Artists and the British Institution.

Hilditch's love of painting was made possible by the family silk business, with which he had a high level of involvement, especially after the death of his father in 1832. Marriage to Mary Bracebridge and the birth of their two sons limited travel abroad and he turned his attention to the landscape of the south coast. The subject of these paintings in Sussex and Kent were later to be reflected in his photographs. He also returned to the riverside at Richmond.

At the Society of Arts exhibition of 1852, Hilditch exhibited both photographic landscapes (calotype) and portraits (collodion). Thirteen photographs were landscapes or townscapes. Some of his earliest photographs record scenes in Richmond, conveniently near to the riverside house of his brother, and several revisit viewpoints of his paintings. In comparison to his well-populated riverside oil paintings, his photographs of the same scenes are eerily empty with an occasional blur of figures in motion.

Photography took over from painting during the latter years of Hilditch's life. From1853, there is a notable decline in the numbers of painting he exhibited. He was one of the early members of the newly established Photographic Society of London and his photographs were shown at the 1854, 1855, 1856 and 1857 exhibitions. The subject matter echoes that of his paintings near the Thames at Richmond and Twickenham, in the city of London and in Sussex and Kent. Hilditch died in Islington, London in 1857. His photographs form the final phase of his artistic career.

CAROLYN BLOORE

Collections

London Borough of Richmond upon Thames, Local Studies Collection (late 19th century prints from calotype negatives) and Orleans House Gallery (oil paintings).

Whitt Library, copies of painting (mainly auction house illustrations).

Bath Royal Literary and Scientific Institute, album of prints from calotype negatives, majority photographs from the London area and SE England.

Hove Museum and Art Gallery, painting, *View of Hove,* c. 1852.

Royal Pump Rooms, Leamington Spa, one unidentified painting.

Family Collections watercolours.

HILL, DAVID OCTAVIUS (1802–1870) AND ADAMSON, ROBERT (1821–1848)
British photographers

The professional and creative partnership between David Octavius Hill and Robert Adamson is one of the most important artistic collaborations in the history of photography. In the span of only four years (1843–1847), the Scottish pair created a large and varied body of work that includes several enduring masterpieces. Best known for dramatically moody portraits and group scenes that

cut across Victorian class lines, the contemporary critic Lady Elizabeth Eastlake claimed their work "first cast the glamour of photography upon us."

The astounding aesthetic and technical sophistication of Hill and Adamson's photographs so soon after the medium's advent was a considerable feat, lending valuable credence to photography's artistic viability. Their broad use of light and innovative printing techniques would later influence the Pictorialists**,** while 20th-century modernists would admire the pair's unequivocal handling of the camera towards aesthetic ends.

As with many great partnerships, Hill and Adamson made an unlikely pair. Hill was born in Perth, Scotland on 20 May 1802, the eighth of 12 children to Thomas Hill, a bookseller and publisher, and Emilia Murray. Adamson, nearly 20 years his junior, was born in Burnside, Scotland on 26 April 1821, one of 10 children to farm proprietors Alexander Adamson and Rachel Melville.

Hill studied drawing at Perth Academy under David Junor and was admitted to the School of Design in Edinburgh in 1818, where he studied painting under Andrew Wilson. In 1821 he produced some of the first lithographs in Scotland in *Sketches of Scenery in Perthshire,* an album published under his father's imprint. Principally a landscape painter, Hill exhibited at the Royal Institution several times in the 1820s. From 1831 to 1840 he secured a reputation as a book illustrator, producing sketches and paintings of Scottish scenes to accompany the works of the country's most famous authors, including Sir Walter Scott and Robert Burns. He achieved considerable success in 1840 with the immensely popular *The Land of Burns,* for which he painted 61 landscapes, and his status as secretary of the Royal Scottish Academy (1830–1869) helped secure his place in the Scottish art world.

Adamson, on the other hand, was sickly and introverted as a youth and cultivated an aptitude for science and mechanics. He enjoyed building models and instruments and in his adolescence apprenticed for a millwright for one or two years, but his uncertain health prevented him from continuing in that field. His older brother Robert**,** a doctor and professor at St. Andrews University, learned William Henry Fox Talbot's calotype photography process from his colleague Sir David Brewster in 1841, and he taught Adamson the process the following year. The brothers embarked on an intense period of photographic experimentation and by early 1843 Adamson decided to become a professional photographer in Edinburgh.

Hill and Adamson's partnership arose from a fortuitous confluence of events in May 1843. On 10 May, Adamson opened his studio in Rock House, on Calton Hill Stairs in Edinburgh and a week later, beginning 18 May, the Church of Scotland held its general assembly in the city, an acrimonious event that resulted in the breakaway Free Church of Scotland. Hill attended the assembly and saw an opportunity to commemorate an important episode in Scottish history and further his own career by creating a large-scale painting depicting the momentous signing of the Deed of Demission, then selling engravings of the work by subscription. As the task would require hundreds of sketches of assembly delegates, by early June Brewster had suggested photography to Hill and introduced him to Adamson.

Adamson eagerly joined the project, hastily photographing church leaders, and soon both men apprehended the greater potential of their collaboration. By July they were advertising and exhibiting their work as a team and planned photographs "representing diff[eren]t bodies & classes of individuals." At year's end the Free Church series was nearly complete, after additional sittings at a second assembly in Glasgow, and the partners broadened their scope to make views around Edinburgh as well as commence a pioneering series of labor portraits from the nearby Newhaven fishing community.

Despite contrasting personalities and talents, Hill and Adamson easily established a productive relationship, suggesting that each had an almost intuitive understanding of the other. Hill's charisma and artistic background combined with Adamson's perfectionism and previous photographic experience allowed each partner his own strengths as well as a healthy sense of dependence on the other. Although photo-historians occasionally have credited Hill as the artistic force behind the collaboration, with Adamson acting only as assistant (since he handled all camera and printing operations), the relationship appears far more complex, and neither man's outside work rivals the pair's collaborative results.

Relying on their connections to the British publishing, art and academic worlds, they assembled a prestigious and willing pool of sitters that included painters, sculptors, writers, scientists, statesmen and scholars. Their portraits convey these individuals as engaging, dynamic and thoughtful, exhibiting a remarkable consistency in tonal range matched with compositional schemes inspired in part by the Scottish portraiture tradition, particularly the work of Sir Henry Raeburn.

Hill and Adamson blended sophisticated posing with modulated, reflected light that intensified forms and enhanced interplay with the surrounding space. Their work was frequently compared to Rembrandt's in its bold use of light, not merely to accentuate details but to create strong massings of light and dark that brought an emotional depth to the sitter. They turned the limitations of the camera and the calotype to their advantage, benefiting from the paper's rough grain and the lens' slight peripheral distortion to create areas of sharpness and softness. "The calotype failing in details," Adamson explained, "is the very life of it" (Ford and Strong 1974, 37).

In their portrait of "Miss Justine Munro," Hill and Ad-

Hill, David Octavius; Robert Adamson. Officer of the 92nd Gordon Highlanders Reading to the Troops, Edinburgh Castle. *The Metropolitan Museum of Art, The Rubel Collection, Purchase, Lila Acheson Wallace, Ann Tenenbaum and Thomas Lee, and Harriette and Noe.*

amson combine deep shadows with the paper's texture to soften the transitions from the sitter's patterned dress to her long, curly hair and smooth face. A curl dangling over her hand brings complexity and spontaneity to the pose, while the shadowy area below the face directs attention to her musing expression.

Hill and Adamson were unrivaled in their depictions of groups and children, despite the challenge of preparing interesting compositions that could withstand long exposure times. Their adult groupings, like "Dumbarton Presbytery" (1845), mimic animated discussions and other moments of camaraderie, as exchanged gazes suggest a secret shared or an evolving debate among participants. Their photographs of children tend to reflect moments of play or reverie, as in "The Gowan," where a girl tickles her sleeping sister, or "The Minnow Pool," where children peer expectantly down their fishing pole into murky waters.

Perhaps Hill and Adamson's greatest achievement, however, remains their series on the fishing families of Newhaven, a coastal village just outside Edinburgh. The project ran the length of their partnership and even may have had its roots in similar subjects taken by Adamson and his brother in 1842. An early attempt at social documentary photography, it was a comprehensive effort to convey the living conditions and social relationships of a community. To give authenticity to the endeavor, the photographers descended on the village to depict fishermen tending their boats and lines along the shore and women selling the catch in the streets.

In "Willie Liston Redding the Line" (c. 1845) a young fisherman leans as though ready for action, while the taut fishing line clenched in his hands indicates his potential energy. Photographs like "Bringing in the Catch" (c. 1845) or "Mrs Barbara (Johnstone) Flucker Opening Oysters" (c. 1845) sought to capture moments of everyday labor, despite the impossibility of instantaneous exposures.

Newhaven's inhabitants perfectly suited Hill and Adamson's interest in quintessentially Scottish subjects, offering a glimpse of an enterprising and fiercely independent traditional lifestyle in the face of rapid social and economic change. Accompanied by scenic views of Newhaven and its neighboring harbors on the Firth of Forth, the series produced a study of community on a scale that was rarely repeated before the 20th century. While the project reinforced existing class distinctions as much as it sought to reach beyond them, it is significant that the photographers often identified specific sitters in the titles, placing these people on the same level as the studio's more celebrated sitters, rather than treating them as genre study subjects.

Hill and Adamson sold these and other photographs through the Edinburgh gallery of Hill's brother, Alexander, and also accepted outside commissions on various themes. Their romantically-suffused images from Greyfriars Churchyard, for example, were originally undertaken as a study for the painter George Harvey. They also traveled to York, England, in September 1844, to make portraits and architectural studies during the meetings of the British Association for the Advancement of Science. While these projects kept the studio busy

enough to hire a photography assistant, a "Miss Mann," it still was not enough to satisfy their aspirations.

Having interrupted a promising career as an illustrator, Hill convinced Adamson early on that they ought to publish their work. In 1844 they acquired a custom-made, large-format camera capable of producing images up to 16 × 13 inches (41 × 33 centimeters) that could better compete with engravings. That August they announced plans to produce albums "in a style of great elegance" and available by subscription, advertising a half dozen titles: *The Fishermen and Women of the Firth of Forth, Highland Character and Costume, The Architectural Structures of Edinburgh, The Architectural Structures of Glasgow &c, Old Castles, Abbeys &c. in Scotland,* and *Portraits of Distinguished Scotchmen.*

Each album was expected to contain 20 to 25 prints, but none was ever realized. While the price likely dissuaded many, continued public uncertainty over the photograph's quality and durability perhaps proved an even greater impediment. The larger photographic formats turned out to be harder to prepare and manipulate, yet Hill employed them in his attempts to enter the more lucrative English market, sending sets of images to London art dealer Dominic Colnaghi in 1845 and London publisher John Murray a year later. Neither man was interested, however, especially given that Talbot maintained an exclusive patent on calotype printing in England. As a result, the only publication to appear during the studio's lifetime was the more modest *A Series of Calotype Views of St. Andrews,* printed in a small run at Rock House by the photographers themselves in 1846.

"My ambition is to leave my name on a great and noble work worthy of England," (Stevenson, 1991, 13) Hill confessed to a friend in 1845. In his discouragement over their limited success despite enormous critical praise, he considered giving up photography more than once. By 1846, as the pair made some of their most lyrical work in landscape photographs like "The Fairy Tree at Colinton" (c. 1846), Hill returned to painting to accept an ambitious commission for a scene of Edinburgh Castle, which he based in part on photographs of its architecture and Gordon Highlander guards. In the meantime, Adamson's failing health slowed the studio's photographic output, bringing it to a halt by mid-1847. Despite returning to his family in St. Andrews to recuperate, he died on 14 January 1848.

Adamson's death brought an end not only to the partnership but to the studio. Although Hill and Adamson's unmatched reputation would have made it easy for Hill to recruit another partner, only Adamson's brother Robert seemed an adequate replacement, but his medical practice prohibited the move.

Instead, Hill pursued his work as secretary of the Royal Scottish Academy and continued painting, making only brief returns to photography, the most significant of which was a partnership with the Glasgow engraver and photographer, Alexander McGlashan, from 1861 to 1862. While his glass negative wet collodion portraits with McGlashan bear some resemblance to his previous work, Hill's style was unsuited to changes in the medium. No longer able to rely on Adamson's subtle printing techniques, the uniform sharpness of the images diluted any overall impact in distracting details.

In 1866 Hill finally completed his painting "The Signing of the Deed of Demission," over two decades after the fact. Heavily dependent on the Free Church portraits, the curious composition resembles a photomontage of long, narrow rows of crowded faces. Hill's inclusion of Adamson pointing a camera makes the work as much a testament to photography as a depiction of the event it ostensibly sought to commemorate.

Hill sold the entire contents of Rock House—including all remaining photographs and negatives—to the photographer Thomas Annan in 1869 and died in Newington on 17 May the following year. It was Annan's son, James Craig Annan**,** who finally got the photographs exhibited in England and abroad at the close of the 19th century and published them as photogravures in Alfred Stieglitz's *Camera Work* from 1905 to 1912. The resulting renewal of interest in Hill and Adamson's achievement secured their place in the history of the medium as well as their significance to future photographers.

STEPHEN MONTEIRO

Biography

David Octavius Hill was born 20 May 1802 in Perth, Perthshire, Scotland, the eighth of 12 children to bookseller Thomas Hill and Emilia Murray. He studied drawing at Perth Academy under David Junor and painting under Andrew Wilson at the School of Design in Edinburgh (1818–c. 1821). In 1821 he published *Sketches of Scenery in Perthshire* and illustrated several major works of literature in the 1830s. He was secretary of the Royal Scottish Academy from 1830 to 1869 and exhibited landscape paintings and sketches at the Royal Institution in the 1820s and at the Royal Scottish Academy from the 1830s to the 1860s.

Robert Adamson was born in Burnside, Fife, Scotland on 26 April 1821 as one of 10 children to farm proprietors Alexander Adamson and Rachel Melville. He developed an early interest in science and technology and apprenticed with a millwright before learning photography from his older brother Robert in 1842. The two collaborated for several months and in May 1843 Adamson opened a

professional studio at Rock House in Edinburgh, where he was joined by Hill within a month.

Hill and Adamson were in partnership from 1843 to 1848 and produced commissioned portraits and sold prints through Alexander Hill's Princes Street gallery. Unsuccessful at publishing proposed albums on Scottish themes, they nevertheless produced about three thousand photographs and exhibited at the Board of Manufacturers (1843), the Royal Scottish Academy (1844 and 1845) and, after Adamson's death, at the Great Exhibition at the Crystal Palace (1851).

Adamson never married and died in St. Andrews on 14 January 1848. Hill became a member of the Photographic Society of Scotland in 1856 and ran a studio with Alexander McGlashan from 1861 to 1862, where he published *Some Contributions Towards the Use of Photography as an Art* (1862). He sold the remnants of his studio with Adamson in 1869. He was married to Ann McDonald in 1837and had two daughters, though only one survived birth. His wife died in 1841 and in 1862 he married the sculptor Amelia Robertson Paton. He died 17 May 1870 at Newington Lodge, Mayfield Terrace, Scotland.

Major holdings of Hill and Adamson's work are in the National Galleries of Scotland (Edinburgh), the Glasgow University Library, the National Media Museum (Bradford), the National Portrait Gallery (London), the Victoria and Albert Museum (London), and the George Eastman House (Rochester, NY).

See also: Rigby, Lady Elizabeth Eastlake; Pictorialism; Talbot, William Henry Fox; Calotype and Talbotype; Brewster, Sir David; Wet Collodion Positive Processes; Annan, Thomas; Annan, James Craig; Stieglitz, Alfred; and Photogravure.

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HILL, REVEREND LEVI L. (1816–1865)

In 1850, the Reverend Levi Hill, (a clergyman taking daguerreotypes professionally in Westkill, New York), produced coloured images, which were authenticated by the editor of the *Daguerreian Journal*, who called them Hillotypes. Professional photographers demanded details of the process, but Hill emphasised that he would not divulge his procedures until the proper time, which caused some scepticism.

Two years later, Hill published a statement to the daguerreotypists, which was also available to the American public. He repeated his claim for colour daguerreotypes, but admitted that his uncertainties continued. Exasperated by the decline in sales caused by the first announcement, professionals accused Hill of deception. In 1856, Hill attempted a clarification, but according to Beaumont Newhall, it was "a confused and complicated piece of writing."

On Hill's death in 1865, *Humphrey's Journal of Photography* expressed a sympathetic valediction. The writer did not contest Hill's achievement, but suggested the colour was the result of a fortuitous combination of chemicals, which he had never been able to replicate. The recent rediscovery of a significant number of Hillotypes in the archives of the Smithsonian Institution, Washington, vindicates Hill's claims to have been successful, and recent experiments in the U.S. and the UK have managed to replicate his achievements with some success.

RON CALLENDER

HILLERS, JOHN K. (1843–1925)

German born Hillers settled in America in 1852. In 1871 Hillers was a recently discharged U.S Army Sergeant who met explorer and ethnologist, Major John Wesley Powell. Hillers needed work and Powell needed a boatman for a second expedition through the Grand Canyon. During this trip Hillers changed from being the boatman to the trip's photographer. Hillers worked for Powell, who became the Director of the U.S. Bureau of Ethnology, from the 1870's until around 1900. His photography changed from geological documentation to documenting people, e.g., the Hopi and their surroundings. He was part of the first team to photograph the Zuni and surrounding pueblos, from a anthropological perspective, in 1879. Hillers' photography played a vital role in the U.S. Government's plan to promote the West to settlers and investors. By capturing the lush, vast expanses of land that settlers could obtain, coupled with peaceful images of Native Americans, the frontiers were opened and a huge exodus to these territories occurred. Because Hillers spent his lifetime working as a government photographer, his work was seen by a much wider audience than many of his contemporaries. Although well known for his stereographs and oversize albumen prints, an unusual example of his work was recently restored. This was a set of window transparencies of Native American Indians, with a set of landscapes, commissioned by the Riordan brothers.

Jo Hallington

HILLS, ROBERT AND JOHN HENRY SAUNDERS

The firm of Hills & Saunders was one of the most prominent photographic studios established in 19th century Britain, with 7 branches throughout London and surrounding counties. It remains one of the extremely few Victorian studios to survive to the present day.

Hillers, John K.. Moki Girls.
The J. Paul Getty Museum, Los Angeles

The firm was founded by Robert Hills (1821–82), born in Lambeth, South London, who started his career with the china & glass merchants Spiers & Son in Oxord in 1850. Spiers opened a branch shop as perfumers in 1851, and Hills was appointed manager in the following year, combining this with work as a hairdresser and wigmaker, as well as agent for the British Empire Fire Office. In mid-May 1856, Hills moved into photography, and opened the Oxford Photographic Gallery a few doors from Spiers' shop in Oxford's Cornmarket By the start of 1857, Hills was advertising his collodion portraits in "Jackson's Oxford Journal," and later in the same year, photographed the local militia on parade, as well as the first in a lengthy series of Oxford Colleges.

The studio was partly damaged by fire in April 1860, and Hills took the opportunity to separate it from the hairdressing and perfumery businesses, which were relocated to new premises on the opposite side of the street. The increasing volume of photographic work, even with a staff of 15, led Hills to seek a partner, and in June 1860, he was joined by John Henry Saunders (1836–90), a former assistant. The hairdressing business was finally sold in March 1862.

The 1860s proved a busy period for Hills & Saunders. In June 1863 they photographed Queen Victoria's visit to Oxford, and subsequently were invited to photograph the Royal family at Windsor. The Cornmarket shop was considerably extended in 1864, and the firm received the Royal Warrant in April 1867. Hills was elected councillor for the West Ward of Oxford in 1869, and opened branch studios in Aldershot, Cambridge, Harrow & Eton, as well as Sandhurst later. Outside Oxford, however, their most successful studio was in London, opened in 1868 with premises in Porchester Terrace, Bayswater, under the management of Alexander Cowan (1839–1922), who as a young man had worked for Paul Pretsch's Galvanographic Studio, and would subsequently manage Marion's vast dryplate factory at Southgate in the 1880s. By the end of the 1860s, Hills had moved with his growing family to a mansion on the outskirts of Cambridge, though he continued to sleep on the Oxford premises 3 or 4 nights a week.

The London studio moved a few doors up Porchester Terrace in 1869, but was destroyed in a fire in Api1 1875. It was rebuilt on a larger scale, and continued until 1886. In 1893, it moved to Sloane Street, Chelsea, where its opening was featured in "Westminster Budget." The article gives a flavour of Hills & Saunders' upper class tastes:

> In the Sloane Street studios there is (no) make-believe sumptuousness. Everything is genuine; the curtains and draperies which fall in soft, seeping folds, wherever they are required, are of real brocades and other art stuffs. The tall palma... are very much alive. The gleam of red copper vases and art—pottery pedestals brightens the dim light of the rooms. Thick carpets cover the floor, and all round the walls are pictures old and new of Royalties and eminent men and women of the past and present, of beauties and beasts—that is to say, of prancing steeds, which their proud owners have caused to be immortalised by means of photographs."

Robert Hills died in Oxford July 27 1882, and his share of the business was continued by his widow, Ann (1820–1905) and son Henry James Hills (1857–99). John Henry Saunders died at Gerrards Cross, Buckinghamshire September 15 1890, and his widow, Elizabeth (1846–1918) with 3 of his children, Frank, Eleanor & Catherine continued his interests. Hills left an estate valued at almost £30,000 (c £1.8 million today), while Saunders' estate was sworn at £10,300 (c. £600, 000 today). The premature death of Henry Hills in 1899, however, caused the business to be sold out of the founding families ;the Cambridge branch had been bankrupted in 1892, and the London studio closed in 1895. The Oxford flagship branch, still on its original premises, soldiered on into the 1930s; in February 1931 it was sold to the rival studio of Gillman & Soame in Oxford, who finally closed it in 1935. The branches in Eton & Harrow continued to trade almost to the present day, buoyed by lucrative contracts with the local boys' public schools - indeed, the Eton premises are owned by the school. Both branches were acquired by Richard Schemansky in the 1990s; Harrow closed shortly after, but the Eton branch continues in the Hills & Saunders name as a reminder of its former history.

The educational and Royal connections established by Hills & Saunders have ensured the survival of a considerable body of work. Both Eton College & Harrow School possess collections of both single and group portraits of school personnel from the 1860s to the present, sections of which have been published in various school histories over the last 50 years. The Royal portraits are housed in the Windsor Castle Archives, and have also been widely published in recent years. The National Gallery has a small collection of negatives of celebrities, mostly from the late 19th/early 20th centuries.

David Webb

See also: Dry Plate Negatives: Non-Gelatine, Including Dry Collodion; and Victoria, Queen and Albert, Prince Consort.

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HIME, HUMPHREY LLOYD (1837–1906)

Canadian photographer

Humphrey Lloyd Hime was born on September 17, 1833 in Moy, County Armagh, Ireland. Educated in England from the age of 15 where he learned textile manufacturing, Hime emigrated to Canada in 1854 where he worked on land survey crews until January 1857 when he joined the Toronto firm Armstrong, Beere & Hime as a junior partner. He learned photography from William Armstrong (1822?, Dublin, Ireland–1914, Toronto) and Daniel Manders Beere (1833, Ireland–1909, Australia). Hime's two most significant photographic achievements were a nearly 360 degree panorama of Toronto taken in 1856 or 1857 with Armstrong from the roof of a hotel, and his participation as a photographer in the 1858 Assiniboine and Saskatchewan Exploring Expeditions led by H.L. Hind, the first such use of photography by an official Canadian exploration party. Hime had mixed results with his wet-plate photography on this journey, achieving the most success under more controlled conditions at the Red River Colony and Fort Garry in Manitoba. Some of the photographs were published in a portfolio in 1860 to accompany a two-volume commercial edition of Hind's expedition report. After leaving Armstrong, Beere & Hime in June 1861, Hime had wide-ranging business interests, and served in municipal politics. He was also a founding member of the Toronto Stock Exchange, and acted in various official capacities, including two terms as its president. Hime died in Toronto, Canada, on October 31, 1903. The largest collections of Hime's 1858 expedition photographs, none of which have survived in negative form, are at the Library and Archives Canada, the Toronto Public Library, and the Provincial Archives of Manitoba.

Dave Mattison

HINTON, ALFRED HORSLEY (1863–1908)

Landscape photographer

Trained originally as an artist, after he had met and was influenced by H. P. Robinson, Alfred Horsley Hinton took up photography and in 1889 worked at a photographic suppliers. From 1891-93 he managed H. P. Robinson's son, Ralph Robinson's, and Guilford photography studio, then turned full time to journalism. He edited *Photographic Art Journal* (1887), *Photographs of the Year* (1892), and *Amateur Photography* from 1893 until his early death at 45. He wrote several books and articles for *The Times*, *Daily Telegraph*, *Daily Graphic*, and *Yorkshire Post*. Through writing (with texts also translated into French and German), curating exhibitions, lecturing, and his own photography, he became one of the leading advocates of 'Pictorial Photography' (Stieglitz published two of his articles). A founding member Linked Ring Brotherhood (1892–1910), set up by a group of British photographers who left the Photographic Society (later Royal Photographic Society) of Great Britain and held their own salons from 1893–1905, and notable for his romantic depictions of the Essex flats and the Yorkshire moors, J Dudley Johnston described him as the father of the 'British School of Landscape Photography.' Hinton believed in photography as an individual form of expression but fundamentally that also meant that, in order to be an art form, it had to be capable of the same capacity for manipulation as painting or printmaking. Using the platinotype, often with combination negatives, and additions in pencil, George Bernard Shaw described him as a 'fuzzographer.' The praise and respect he earned has evaporated today, perhaps due to the lack of surviving images in significant numbers and the animosity which continues towards the 'Camera Clubs,' which still operate, thanks to Hinton *et al*, in the wake of the Pictorialist tradition.

Alistair Crawford

HISTORIOGRAPHY OF NINETEENTH-CENTURY PHOTOGRAPHY

Although the 20th century has defined photography primarily as a medium of visual expression, the 19th-century experience of photography cannot be understood without giving due credit to its novelty and its status as invention. That photography was an invention may seem trivial, but it needs emphasizing because the novelty and the technicality of photography to the 19th-century mind were effaced by the advent of popular photography around 1900, and because the ensuing reevaluation of photography's visual heritage resulted in obscuring much of the 19th-century cultural reception of photography.

The idea that photography was an invention—and not a method, craft, or art—was decisively embodied in the 1839 French law on the daguerreotype, which awarded a pension to the inventors in return for the publication of their process. The bill's justifications paradoxically stated that the process was too simple to be patented, that it was more of an idea or discovery than of an industrial process, and that once it was known, anybody would be able to use it (and thus to "make drawings as adroitly as a skilled artist") without paying a fee. This paradox

reflected a deeper hesitation between the notions of invention and discovery, i.e. between the photograph as mechanical product and as natural image. As is known, however, a patent was taken out for the daguerreotype in England, and for most of the 19th century the practice of photography remained esoteric, and mostly limited to professionals. In 1839, moreover, Daguerre and Niépce's son were honored as inventors, and the whole rationale of the French bill was that their process was indeed an invention—original, practical, historic, and so useful to science and society that it behove the government to buy it and make it public. Thus, the law on the daguerreotype programmed and legitimized the formidable spread of photography into every corner of the globe and into every branch of activity, which was often rationalized in terms of "applications" to particular goals when in fact it betrayed a self-justifying ideology of modernity. By the same token, it emphasized a connection between the definition of photographs as exact images obtained by a natural or mechanical process (without the artist's hand) and the perspective of everybody making such exact images (since they required no special skills)—in other words, between the idea of an artless image and that of a democratic art. This idea of photography as an invention that made a technique of both viewing and making unquestionably realistic pictures of the world accessible to everybody was just as revolutionary as the magical, eerie realism of photographic pictures.

Although this idea was contested in the parallel, epoch-making invention of the negative/positive process and the practice of the calotype as expressive art by William Henry Fox Talbot, many other signs confirm that 19th-century culture generally treated photography as an invention. The inaugural Franco-English quarrel over the real father(s) of photography, the obsessive quest of later historians for the true inventor, the many lawsuits of photography's first decades, and the prominent place of photography in popular science compendia on the "wonders" of the century—these were only some of the facets of a framework that defined, valued, and limited photography in terms of invention and technology, as opposed to other forms of culture. Although after 1855 photographs were sometimes exhibited in art expositions, they were usually separated from the fine arts, and more commonly, as in world fairs, they belonged with the products of industry. And yet, because this invention set a new standard of pictorial truth, it very forcibly projected technology into the realm of art and into philosophical and aesthetic discussions of images, truth, and reality. Because it heralded universal access to pictures and to picture-making, and therefore questioned traditional privileges, it raised broader issues about the place of art and pictures in society. Finally, it must be noted that in the strongly emotional response that everywhere greeted the advent of photography, the striking faithfulness of photographic images was inseparably linked to the dramatic—in some cases almost fantastic—novelty of the experience of seeing them. This response was not always favourable, but it was clearly and durably hyperbolic, and thereby expressive of a deep perturbation of the cultural order, as shown especially by the famous essays of Lady Elizabeth Eastlake (1857), Charles Baudelaire (1859), and Oliver Wendell Holmes (1859–1863), which twenty years after the first announcement of photography recorded that upheaval with the same emphatic tone, albeit with different judgements. In writing on photography, artists, writers, critics, and philosophers (such as Baudelaire, Schopenhauer, Emerson, or Ruskin) addressed not only the supposedly uncontrovertible character of photographic evidence, which was almost immediately put into question on a variety of grounds, but the compelling and fascinating novelty of the photographic image, towards which they displayed deep ambivalence. In sum, the 19th century as a whole kept echoing the novelty of photographic images and, inseparably, the power of inventions and inventors to transform society and culture.

In keeping with this global definition of photography as invention, its development was predominantly categorized under the label of technology. This was most obvious with commentators within the profession of photography, which was perhaps especially prone to pride itself on its technical achievement since it was generally refused a more academic recognition. The overwhelming majority of articles published in the specialized magazines that appeared in several countries after 1850 were of a technical nature. Much of this specialized writing was generated by an ongoing technological evolution, which constantly changed instruments, materials, and procedures. Even, however, when they expressed artistic concerns, as indeed they often did, photographic authors typically translated these concerns into technical language, as for instance in early discussions of soft focus as a means of achieving atmosphere and ideality. Likewise, and in the wake of the inquiry into the origins of the invention that started in 1839, 19th-century histories of photography were technical histories. Generally written by practitioners and most often intended also as manuals, these books would summarize the chronology and the technology of the inventions and various processes, typically describing methods in detail, discussing "applications," and emphasizing the spread of photography into the most diverse branches of human activity, as befitted trade publications. This professional discourse echoed the social perception of photography as a technical activity, involving cumbersome apparatus, suspicious chemicals, and occult operations, all the more intriguing since their primary use was to draw one's portrait; and yet it often embodied artistic concerns, as in Marcus Root's *The*

Camera and the Pencil (1864). As many recent studies have shown, the professional arena indeed included, through its practices of association, publication, exhibition, evaluation and training, active channels of critical evaluation, and even technical concerns were rarely devoid of aesthetic intent. Meanwhile, a fair amount of specialized technical information found its way into general-interest publications, insofar as photography was widely perceived, down to the last years of the century, to be full of evolutive potential, towards new frontiers such as color and instantaneous photography, and popularization of the basic processes. In fact, the dominant feature of non-specialized discourse on photography, notably artistic discourse, was a similar emphasis on the technical nature of photography, except that it stressed a mechanical rather than a strictly technical character, leading often to exaggerated dichotomies between art and industry, inspiration and imitation, naturalism and symbolism, and so on, but also, especially in literary reflections, to a more profound questioning about the potential role of photography as an esthetic model. In short, despite conflicting judgements on the values of photography, 19th-century culture fundamentally agreed on its status as invention and technology, which served both as the unifying category in the realm of professional expertise and as a threatening or fascinating Other in general discourse on art and culture.

As late as the very last years of the 19th century, and into the 20th, authors of histories of photography such as the Frenchman Gaston Tissandier or the Briton John Werge construed the history of photography as that of an invention. Things quickly changed after 1900, that is to say after the advent of popular photography and the emancipation of artistic practices and institutions, and just as collectors started accumulating traces of a bygone era—prints and plates as well as equipment. The old-style, professional kind of history was on the decline, although it survived in the 1920s in works such as those of Georges Potonniée, and although the subject of photographic technology was renewed in German-speaking countries, in the wake of the monumental researches of the chemist Josef-Maria Eder, whereby technical history became explicitly scholarly, in fact closer to the history of science. Meanwhile, and especially after 1930, a new trend appeared that gave an organizing role to the artistic achievement and the cultural significance of photography. Although this trend was partly linked to the strategies of particular collectors and museums (the classic example being Beaumont Newhall's collaboration with New York's MOMA), it reflected, more globally, the growing recognition of photography as art, and even more importantly the growing experience of photography as a familiar hobby and as a popular vector of memory and culture. This transformation thus went well beyond the Modernist emphasis on art photography, as is shown by the contemporary endeavors of explicitly "social" historians of photography, such as Gisèle Freund, Robert Taft, and even Walter Benjamin. Although it was fairly eclectic and did incorporate the technical element, the new model of photographic history which emerged from these pioneering efforts, and which flourished after 1970—essentially the field of photographic studies as it is known—focussed on the visual heritage of photography, which it made available in ever finer reproductions to ever wider audiences. Because pictures were easier to make and to reproduce, the history of pictures became more significant than the history of their making. Thus, the popularization of photography and photographic culture resulted both in the rise of a broader interest in its history, and in the gradual marginalization of the very dimension—technology—that had theretofore dominated that history. But this was a minor regret in the face of the new visual culture that emerged from these efforts, and in view of the historic achievement that this evolution represented. For indeed the history of photography, in evolving from a history of processes and practices to a history of pictures and meanings, mirrored the very evolution of photography towards its own historical aspirations for a simplified method of making pictures and a universal form of visual expression.

Beyond the concern of early 20th-century critics for the place of art photography in art history, this view of photography as a universal visual mode of expression has led to important redefinitions of the field since 1970. Thus, first of all, the worldwide expansion of photography in the 19th century has been more accurately accounted for. Whereas earlier generations of historians and commentators addressed almost exclusively the development of photography in Western Europe, research in or about other parts of the world has considerably renewed the field. A major example of this phenomenon is the reevaluation of the 19th-century contribution of the United States in the evolution of photography, which was largely ignored in the specialized literature at least until 1900, in spite of awards granted to some American photographers at various international exhibitions in the 19th century. Because of the leading role that American critics and museums took in the development of the field in the 20th century, 19th-century American photography became a topic of unequalled interest and documentation, the U.S. emerging as a particularly active, creative, and culturally open photographic nation, while prints and albums by some especially sought-after 19th-century American photographers reached market prices comparable to those of great French and English calotypes. Although this example shows that historiography and the market will follow global economic and political hierarchies, the development of photographic studies has also focussed increasingly on

areas other than Western Europe and North America, such as Asia (and especially the Middle East), Japan and China, South America (and especially Brazil and Argentina), the Pacific, and Southern, Northern and, especially, Eastern Europe. A classic illustration of this phenomenon is the ever-growing list of precursors of photography, with spectacular examples such as that of the French-Brazilian Hercule Florence, whose early photographic researches only came to light in the 1970s. Studies of the reception of photography in Japan and China have revealed not only previously unknown images but also significant reactions to and deviations from the ideas that Western explorers introduced along with photography. More discoveries are still to be expected from areas and cultures which, although underdeveloped and subject to colonial rule—and therefore generally ill-documented—were nonetheless affected by the spread of photography: thus the 19th-century African, Caribbean and African-American experience of photography, albeit in colonial and institutional contexts, largely remains to be investigated. The history of 19th-century photography has inevitably been written mostly from the point of view of the powers that often organized its uses, and much remains to be discovered about the point(s) of view of its subjects, from colonized nations to ethnic or political minorities to ordinary men and women in the leading countries.

Indeed, whereas early scholarship focussed on the leading nations' artistic circles, academic institutions, and cultural and economic centers, the increasing recognition of the social and local impact of photography has led to more diversified appraisals. Studies of the development of photography in regions of France, Great Britain, or the U.S. may not change the global picture of how photography was conceptualized or practiced in the 19th century, but they show how it was transmitted through society, how it was taken up by local practitioners, how these related to centers of business and power, and how local populations and even individuals—still neglected in accounts of 19th-century photography—responded to the possibility of having their pictures taken, to the kind of spectacles that photography presented them with, or to the option of going into photography as a business. Local studies may yet unearth significant bodies of images, but perhaps more importantly they contribute to a more concrete understanding of the historical phenomenon of the propagation of photography in the world, as does the investigation of the social reception of photography beyond the cultural elites. Although the intellectual and artistic reception of photography remains a priority subject, many 19th-century texts show that it was often influenced by the social dimension and even underwritten by lay discourses and attitudes, as in the example of pictorialism in its relationship to popular photography. Even when limiting the scope of relevant reception to intellectual discourse, the many existing anthologies show that this field itself is no longer so unified as it once seemed. Links have been documented between photography and every aspect of 19th-century intellectual activity, making it difficult to maintain the bias of earlier historians in favor of the sole discourse of professional artists, art institutions, and art publications. Within the sphere of art itself, the relationship of painters (but also writers) to photography has been shown to be more diverse and sometimes more technical than was once thought; meanwhile, it has emerged that photography came to represent a dividing issue, or an organizing model, in debates on realism, representation, the goals and values of art, or methods of documentation and teaching. Meanwhile, studies on scientific and institutional uses of photography have shown that the general enthusiasm of 19th-century scientists for photography left room for reticence, even opposition, and sometimes for elaboration of specific photographic methods. Conversely, when such methodological adaptation did not take place, it appears that the use of photography was often self-justified and resulted in countless supposedly documentary archives—such as ethnographic and geographical collections, and medical or police records—with little or no scientific justification, and which perhaps for this reason have come to be regarded as a cultural and artistic heritage. Many 20th-century (re)discoveries of 19th-century photographic oeuvres have highlighted work that was done outside of the established professions and institutions of art, as in the example of expeditionary photography, which was not generally appreciated in major artistic circles, and which has come to be considered an important field. In sum, the scope of the inquiry into intellectual and artistic reception has broadenend, and traditional divisions between art and science, or art and picture-making, have been increasingly called into question. This broadening has remained limited (many ordinary, anonymous or vulgar photographs have not been given much attention), and it has not seriously challenged the hierarchy of confirmed photographic masters—which was, in part, already in place in the 19th century, and then took a more definitive shape between 1900 and 1950 under the influence of collectors, avant-garde critics, and a few museums; but it has enriched and renewed the global understanding of the 19th century's experience of photography.

It should be emphasized, by way of conclusion, that this experience cannot be summarized by simplistic views about a naively enthusiastic 19th century, sometimes represented as a kind of Dark Age of photography, imbued with technical secrets, intense commercialism, and naive conceptions of truth and art. The reevaluation of 19th-century photographic oeuvres has too often been governed by the assumption that such oeuvres were not duly recognized in their day, and that 19th-century

culture was generally reluctant to view photographs as anything other than mechanical artefacts with utilitarian functions. Much effort has been put in demonstrating that 19th-century culture was naive, positivist, utilitarian or otherwise uncritical: unable to see the mark of art (or of artifice or playfulness) in a photograph, blindly faithful to the "myth" of photographic objectivity, and profoundly misled in its infatuation with novelty and progress. Yet the result of decades of specialized scholarship has been to unveil the unique visual and cultural heritage that this supposedly naive century created; and as some of the most incisive 20th century critics—notably Walter Benjamin and Roland Barthes—have suggested, the 19th-century fascination with photography was an accurate response to a major event in the history of civilization.

François Brunet

See also: Daguerre, Louis-Jacques-Mandé; Niépce; Talbot, William Henry Fox; Calotype and Talbotype; Eastlake, Lady Elizabeth; Baudelaire, Charles; Emerson, Peter Henry; Ruskin, John; Werge, John; Tissandier, Gaston; and Eder, Joseph Maria; Pictorialism.

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HISTORY: 1. ANTECEDENTS AND PROTOPHOTOGRAPHY UP TO 1826

The announcements of the invention of photography in January 1839 by Louis Jacques Mandé Daguerre and William Henry Fox Talbot were preceded by at least four decades of experiments by themselves and others towards this specific goal. Indeed, following these announcements, as many as twenty people, from seven different countries (Britain, France, United States, Brazil, Switzerland, Germany, Spain), were mentioned as having already attempted a photographic process of one kind or another. Among these earlier experimenters were such figures as Elizabeth Fulhame, an Englishwoman who published a book on the 'Art of Dying and Painting' (1794); Henry Brougham, a Scottish politician and intellectual (1794); Thomas Wedgwood, the son of the famous English potter (c. 1800); Nicéphore and Claude Niépce, French brothers and inventors (1814); Samuel Morse, an American painter working in New Haven (1821); James Wattles, a 16-year-old art student living in Indiana (1828); Eugène Hubert, an architect living in Paris (1828); Hercules Florence, a French-born artist and inventor living in a small town in Brazil (1832); Philipp Hoffmeister, an obscure German clergyman (1834); Friedrich Gerber, a Swiss veterinary surgeon teaching at Berne University (1836); John Draper, an American chemistry professor (1836); José Zapetti, a Spanish painter from Saragossa (c. 1837); and Friederike Wilhelmine von Wunsch, a Prussian woman artist living in Paris (1839). All these people, and probably many more, conceived (or later claimed to have conceived) of something approximating photography, but none of them could ever quite perfect a technique that actually resulted in permanent photographic pictures.

If nothing else, this bevy of claimants suggests that photography's conception was the product, not of an individual flash of genius, but rather of various develop-

ments in European culture as a whole. It was only the confluence of these developments in the early nineteenth century that made photography conceivable and perhaps even inevitable. They included general shifts in European society, such as the advent of the Industrial Revolution and consumer capitalism, as well as more particular changes in scientific thinking and technology that led to new theories of light and optics and the production of more refined chemicals and improved lenses. But this significant historical moment was also accompanied by revolutionary changes in the experience of time, space and subjectivity that were equally important to what might be called photography's conditions of possibility. It was the representational demands accompanying these changes that encouraged experimenters to imagine bringing together the basic components, some of them available for some time before 1839, that eventually constituted a workable photographic apparatus. The advent of photography, therefore, was a complex historical event involving social, cultural and technological changes in about equal measure.

The two most important technical components of the photographic apparatus were the camera and light-sensitive chemicals. The photographic camera was a modified version of the camera obscura, an instrument that had been used in one form or another by European artists since at least the sixteenth century. Originally comprised of a darkened room into which light was allowed to enter through a small hole in one wall, the camera obscura eventually became a portable box with a lens at one end and a ground glass sheet at the other. A skilled draftsman could trace an exact copy of the image focused on the glass by the light that has passed through the lens (an improved lens for this purpose was designed by William Wollaston in 1812, and Niépce and Daguerre experimented with a number of different versions in the 1820s). Although moving, reversed and upside-down, this projected image was regarded as a faithful facsimile of the outside world because the light which formed it had passed through the lens and into the camera according to the objective geometric laws of perspective, itself an invention of the fifteenth century. By the time of photography's conception, the camera obscura was one of a number of mechanical instruments—another was the camera lucida, a three-sided glass prism on a retractable stand patented by Wollaston in 1806—employed by artists in an effort to produce more accurate drawings than could be made by the unaided human hand. However such instruments still required some skill to operate successfully. As Talbot famously recalled in 1844, he tried to use both the instruments just described while drawing at Lake Como in Italy in 1833, but the results were "melancholy to behold." It was then, he says, that an idea occurred to him: "how charming it would be if it were possible to cause these natural images to imprint themselves durably, and remain fixed upon the paper!"

The realisation of this idea required Talbot to apply what was already common knowledge amongst those like himself who studied chemistry and physics; namely, that light had a discernable chemical effect on certain silver salts, causing them to oxidise and change colour. This reaction had been noted by the German natural philosopher Johann Heinrich Schulze as early as 1727 and his experiments, which included making stenciled words appear in purple against his white solution of carbonate of silver, were repeated and confirmed by others. Swedish chemist Carl Wilhelm Scheele, for example, undertook experiments on the action of light upon silver chloride and published his findings in 1777, and these were subsequently translated into German, English and French. Swiss librarian Jean Senebier published further experiments along these lines in 1782, timing the effects of different coloured light on chloride of silver. Light was also a subject of much discussion in the period, with the corpuscular theory of light proposed by Newton in the eighteenth century being gradually replaced by the wave theory developed by Thomas Young in England and Augustin Fresnel in France. In 1803 Young, a colleague of Humphry Davy's, even conducted some photographic experiments with light by projecting microscopic images on to a sheet of paper soaked in silver nitrate. Both Scheele and Senebier were among those referred to in the essay by Davy that is generally considered to be the first publication specifically about photography.

This essay, appearing in the *Journals of the Royal Institution of Great Britain* in June of 1802, described various experiments that Davy and his friend Thomas Wedgwood had undertaken with white paper or leather moistened with a solution of silver nitrate and exposed to light. These experiments included attempts to produce both contact prints and images formed in a camera obscura.

> White paper, or white leather, moistened with solution of nitrate of silver, undergoes no change when kept in a dark place; but, on being exposed to the day light, it speedily changes colour, and, after passing through different shades of grey and brown, becomes at length nearly black…The condensation of these facts enables us readily to understand the method by which the outlines and shades of painting on glass may be copied, or profiles of figures procured, by the agency of light...The images formed by means of a camera obscura, have been found to be too faint to produce, in any moderate time, an effect upon the nitrate of silver. To copy these images, was the first object of Mr Wedgwood, in his researches on the subject, and for this purpose he first used the nitrate of silver, which was mentioned to him by a friend, as a substance very sensible to the influence of light; but all his numerous experiments as to their primary end proved

> unsuccessful.... Nothing but a method of preventing the unshaded part of the delineation from being coloured by exposure to the day is wanting, to render the process as useful as it is elegant.

Although the two men could not find a way to stop their images from continuing to develop and going completely black, their findings were republished in at least fifteen different journals or books in England, Italy, Scotland, Switzerland, the Netherlands, the United States, Germany and France. Widely known in the scholarly community, these first steps towards photography informed the later and more successful experiments of, among others, Daguerre and Talbot.

As Joel Snyder has pointed out, it is important to recognise that what made these later experiments successful was the ability of people like Talbot to utilize reliable and dependable quantities of chemicals like silver nitrate and silver chloride and work with new elements and compounds, such as iodine, bromine and sodium thiosulphate, all of which were simply unavailable before the 1830s. However the story of photography is interesting precisely because, as evidenced in the experiments of people like Wedgwood and Davy, its conception preceded the ready availability of these chemicals—the desire to photograph emerged well before the scientific ability to fulfill that desire. Indeed photography's various inventions were as dependent on available materials and trial and error as on modern scientific knowledge. Attempts to perfect a photographic process were also often conducted in the context of other experiments. The Niépce brothers, for example, initially attempted to make photographic reproductions of engravings using light-sensitive bitumen, inspired by the establishment of the first successful lithographic premises in Paris in 1813 and by a financial incentive scheme offered by the French government to improve the process. They went on to attempt to capture views of landscape formed in the back of a camera obscura, using paper soaked in silver chloride, as early as 1816, and then, in their heliographic process, using pewter plates coated with their light-sensitive bitumen solution. The earliest extant example, a view from their studio window, dates to about June 1827. Wedgwood and Davy were both involved in industrial research on ceramics and dying textiles in the 1790s, Samuel Morse worked on a sculpture-copying apparatus at the same time that he first experimented with photography and later developed an electric telegraph system, the Niépce brothers also built a marine engine and attempted a perpetual motion machine, and Talbot took out numerous patents on processes that he hoped would have profitable applications. Photography was, in other words, one of many inventions driven by the combined forces of the Industrial Revolution and consumer capitalism.

This context reminds us of the larger history of which the invention of photography was but one small part—the ascendancy to political and economic power of the middle classes and the attendant proliferation of their values and desires. The influence of middle-class ideology is evidenced, for example, in the emphasis placed within this Romantic period on the sensory and emotional experience of the individual human subject. This licensed an exploration in both art and science of the extremes of human experience—sexual desire, madness, grief, nightmares, fantasy. But it also had important ramifications for philosophy and political theory. The rights of the individual, both political and personal, were a topic of great interest in the later eighteenth century. The most provocative of the various commentaries on these issues came from Frenchman Jean-Jacques Rousseau, especially his idea that the state derives its authority, not from some divine right, but from the consent of the citizenry (from a "social contract" between monarch and citizens). Henceforth, every individual should have the freedom to seek happiness as long as it was compatible with the general good.

This new concept of the nature of human nature was expressed most forcefully in the ideals of the French Revolution of 1789 ("Liberty-Equality-Fraternity"). But it was also manifested in the demand for portraits from members of the European middle class seeking to confirm their new social status and sense of self in the form of an image. Few members of this class could afford a painting, so alternative ways of producing portrait images had to be found. In the 1750s, for example, the silhouette was invented, involving the production of the outline of a shadow profile that was cheap, rapid, portable and relatively easy to make. A machine was soon devised for making these kinds of portraits even more easily. A further improvement on this process, the physionotrace, was invented by Frenchman Gilles-Louis Chrétien in 1786. This comprised a mechanical combination of silhouette and engraving, requiring only a single sitting and enabling multiple reproductions of the portrait image to be prepared. The physionotrace portrait was inexpensive and convenient (requiring even less skill to make than the silhouette), but tended to produce a stylized, static expression on the face of the subject. Although portraiture was not the primary aspiration of the early photographic experimenters (successful portrait photographs would not be made until the 1840s), it is important to remember that their experiments took part in the midst of this general push to mechanise and automate all representational processes.

We seem to have strayed some distance from the practical problem of inventing a workable system of photographic image-making. But we have to remember that, as Talbot concedes in his 1844 essay, photography began as an idea, as a "philosophic dream." A history of the technical development of the photographic ap-

paratus tells us something about *how* photography came to be realised but not much about *why*. To explain the motivation behind photography's conception, we need to identify what it was, philosophic or otherwise, that the early experimenters were dreaming about.

As it happens, most of the earliest accounts we have of the desire to photograph talk of it in representational rather than technical terms. In his first letter to Niépce, written in 1826, Daguerre described them both as "seeking the impossible," by which he meant an image, as Niépce described it the following year, "obtained spontaneously by the action of Light." When Niépce prepared a synopsis of his experiments in November 1829, his title further elaborated their aspirations: "On Heliography, or a method of automatically fixing by the action of light the image formed in the camera obscura." Daguerre's subscription broadsheet, issued in December 1838, again claimed that the daguerreotype "consists of the spontaneous reproduction of the images of nature received in the camera obscura...the daguerreotype is not merely an instrument which serves to draw Nature; on the contrary it is a chemical and physical process which gives her the power to reproduce herself." In his first published paper on photography, presented in January 1839, Talbot described the image he wanted to capture in more poetic language: "the most transitory of things, a shadow, the proverbial emblem of all that is fleeting and momentary." This image, the kind projected into the back of a camera, may, he now claimed, "be fettered by the spells of our '*natural magic*,' and may be fixed for ever in the position which it seemed only destined for a single instant to occupy."

These three brief extracts describe the desire to photograph in terms of a "spontaneous" (meaning, self-generated) representation of a camera image. This was a radical idea. Photography, by allowing nature to represent itself by means of the indexical agency of light, would remove the human hand from the act of representation. But photography would also work to stop the world in its tracks, grabbing a single freeze frame from the passing parade of possible pictures seen in the back of a camera. In other words, these experimenters wanted to make a kind of image that solved two representational problems that had taken on a particular urgency in the early nineteenth century—subjectivity and time.

As described by French philosopher Michel Foucault, this particular moment in European history marks the beginning of an unprecedented relationship between individual citizens and state power, embodied in new social structures and new notions of subjectivity. There was, for example, a general shift in the disposition of power such that the absolute domain of the king over his subjects was transformed into a more diffuse arrangement of legal and social networks involving each citizen in a self-perpetuating system of constraints and incentives. Foucault points to the design of the panopticon by the English utilitarian philosopher Jeremy Bentham in 1791 as an apt metaphor for this new arrangement. The panopticon was to be a form of prison architecture in which incarceration was enhanced by a system of looking. A ring of barred (and therefore transparent) cells was to be built around a central viewing platform, so that a single warder could efficiently survey many prisoners at the same time. A light would always shine down into these cells so that the prisoner couldn't see the warder's platform and thus never knew whether he was being surveyed or not. In this situation, the prisoner must live under the assumption that he is always under surveillance and thereby is induced to behave as if it is so. In a sense, the prisoner ends up watching himself and regulating his own behaviour. The subject in his cell becomes both the prisoner and the warder, both the surveyor and the surveyed, both the vehicle and the victim of incarceration. This, says Foucault, is the general principle for the whole of social organisation in the modern era, and also for the constitution of each individual subject.

The panopticon turns the gaze back onto the subject who gazes, in effect dividing the subject from himself. And indeed, as Enlightenment reason increasingly addressed itself to the question of the nature of the human subject, "Man" himself became an object of study, finding himself examined for the first time in taxonomic terms. As a consequence, the years around 1800 witnessed the disintegration of Natural Philosophy and the birth of a whole archipelago of sciences of the human, including all the comparative social sciences, such as anthropology, sociology, criminology, clinical medicine and so on. This scientific study of "Man" necessarily had to include his physical capabilities and limitations. Human beings, once thought to be God's mortal incarnation, had turned themselves into specimens to be examined and analysed like any other.

The emergence of biology as a separate science involved, for example, the systematic study of sight, science's primary means of investigation, and of sight's instrument, the human eye. Like the camera, the human eye was known to operate according to the rules of perspectival geometry, allowing light to form images on the back of the retina; therefore sight has reason as its very means of operation. Accordingly, knowledge and sight had long been thought to have a close association. But around 1800 it was found that the human eye is also fraught with physiological frailties. It was found, for example, that the eyeball was in constant movement, and simple tests showed that not everyone saw things in the same way. In 1818 Talbot wrote to his mother to tell her that he had been "reading books on the structure of the eye" and about his own experiment in this area. He had gently pressed his eye with his finger to try and improve

his congenital shortsightedness; a more distinct vision was the result. Through such simple experiments as these, the human body, in all its contingency and physical specificity, was shown to generate its own images. Eight years earlier, the German philosopher Goethe had proposed a series of simple experiments in which one stared into bright light or at colored objects and then closed one's eyes. His point was that the observer continued to see colors and shapes, a retinal afterimage produced, he argued, by the eye itself. The human body, in all its contingency and specificity, generates its own spectrum and thus becomes the active producer, not just the passive receiver, of optical experience. Thus by the early nineteenth century, seeing, once thought to be an action composed of a reliable and unmediated reflection of an outside world, is situated in and identified with the specific body of the individual human subject.

The observer is no longer presumed to be the passive and transparent conduit of God's own eye but is now imagined to actively produce what is seen. Moreover, scientific study showed that seeing was inseparably tied to the particular exigencies of the time and circumstances within which that act of seeing takes place. In that sense, the subject seeing and the object being seen could be said to be continually producing one another. These conclusions were in accord with the basic tenets of German Idealist philosophy that was then being propagated throughout Europe. Immanuel Kant considered the human mind to be not a mirror but a legislator of nature; human beings actively constitute their world through their representations of it. The act of this constitution, he argued, is at the same time a self-realisation, a constitution of the self. Thus the subject makes the object, even as the object makes the subject. Georg Hegel took this idea and located it within a grand system of historical and human forces (such that being is not fixed but is rather a never-ending process of becoming). The instigators of the French Revolution were acutely aware of their differences from past generations, and demanded histories that recognised this fact. Hegel's arguments about human subjectivity as something continually in process were formed in the midst of this general expansion in historical consciousness. In 1798 the poet Samuel Taylor Coleridge was sponsored by Tom Wedgwood and his brother to travel to Germany and study this philosophy at first hand. His subsequent writings, which influenced Wedgwood, Davy and, a little later, Samuel Morse, could be taken as an attempt to articulate these new ideas in poetic form. As Coleridge put it in 1825, to understand the modern subject, what had to be imagined was a "self-conscious looking-glass" or even "two such looking-glasses fronting, each seeing the other in itself, and itself in the other." The traditional camera obscura could no longer fulfill this radical new world-view. What had to be invented instead was an apparatus of seeing that involved both reflection and projection, that was simultaneously active and passive in the way it saw things, that incorporated into its very mode of being both the subject seeing and the object being seen.

We have one notable reference by Coleridge that explicitly links his imagined apparatus of seeing to Tom Wedgwood's photographic experiments. On November 16, 1802, Coleridge wrote a letter home to his wife while on a hiking expedition to South Wales with his friend Wedgwood. "He will be out all the mornings—the evenings we chat, discuss, or I read to him. To me he is a delightful & instructive Companion. He possesses the finest, the subtlest mind and taste, I have ever yet met with.—His mind resembles that miniature Sun seen, as you look thro' a Holly Bush, as I have described it in my [1798 poem] *Three Graves*:

> A small blue Sun! and it has got
> A perfect Glory too!
> ten thousand Hairs of color'd Light,
> make up a Glory gay & bright,
> Round that small orb so blue!"

Coleridge here compares Wedgwood's mind to an image created by the lens-effect of a leafy tree projecting the image of the sun, by, in other words, a natural camera obscura. Given that he is writing only a few short months after Wedgwood and Davy's essay appeared in the *Journals of the Royal Institution*, an appearance they must surely have discussed in detail, Coleridge is, in effect, likening Wedgwood's ever-inquiring mind to a photographic image-making process.

Philosophy was not the only discipline dreaming of such a process. If the naked human eye is prone to mistakes and physiological imperfections, the sciences had to devise a more dependable method of 'seeing' and recording visual information. This effort coincided with the increasing importance of empirical science as an ideological discourse. By the 1830s this discourse had been theorised as Positivism, based on the idea that truth is confined to forms of knowledge which can be empirically and repeatedly tested under scientific conditions (truth is knowledge which can be made *visible*). But even in the previous century, the Royal Society and similar organisations were putting more and more stress on the need for objective forms of representation and calling for the production of accurate pictures that allowed different specimens and views to be directly compared and studied. The early photographic experiments with botanical contact prints by Wedgwood and Talbot, for example, sought to improve on nature printing, a centuries-old procedure in which a physical specimen would be inked and pressed directly onto paper. An image that could be made to spontaneously represent itself in a camera would be similarly true to nature, being not only an accurate

picture of the world but, through photography's harnessing of the "natural" laws of chemistry and physics, also true to nature's own way of being.

By the nineteenth century this way of being was conceded to be a difficult thing to pin down, precisely because nature was itself constantly on the move. Where once the earth had been regarded as eternal and static, looking now much as it did on the day of Creation, scientists began to uncover increasing evidence that the world around them had a long and tumultuous history. In 1774, in his *Théorie de la terre*, French naturalist Georges Buffon gave the earth an age of "approximately" 74,047 years; with the advent of the science of geology and the theory of evolution in the early nineteenth century this figure was extended into the millions of years. Nature was apparently an entity always in process, a fact that could be witnessed by any individual, just by looking around them and trying to describe that they saw.

Coleridge is a prime example of such an individual. Calling himself "an Eye-servant of the Goddess Nature," his poetry sought to somehow represent in images made with words the lived experience of seeing the world. Informed by modern science, with which he was very familiar, he regarded nature as "an ever industrious Penelope for ever unravelling what she had woven, for ever weaving what she had unravelled." In much of his work he tries to capture the instant of perception, that image which is in the eye for only a moment before it changes forever. But he has to do so through a form of representation (writing) that is permanent and fixed in place. His problem, as he often laments, is that the moment always passes faster than his words can cohere. How can he produce a representational form that solves this 'time anxiety,' that combines both permanence and the instant, both fixity and transience?

In 1817, Coleridge described this ambition with a strikingly photographic metaphor; he desires, he says, "creation rather than painting, or if painting, yet such, and with such co-presence of the whole picture flash'd at once upon the eye, as the sun paints in a camera obscura." In poems like *The Eolian Harp* (1795) and *This Lime-Tree Bower My Prison* (1797) he again compares this 'co-presence' to the fleeting image stilled by the camera obscura or its equivalent (specifically, an Eolian Harp, which allows the wind to create its own music, and a leafy bower that projects an image of those leaves onto the ground below). Stretched out on the side of a hill at noon, he looks upwards through half-closed eyes, seeing nothing but "the sunbeams dance." He becomes, he tells us in *The Eolian Harp*, a kind of living camera.

Full many a thought uncall'd and undetain'd,
And many idle flitting phantasies,
Traverse my indolent and passive brain,
As wild and various as the random gales
That swell and flutter on this subject Lute!

Hovering between passive reverie and active thought, the object of Coleridge's vision is nothing less than his own subjectivity. True to idealist philosophy, he assumes that "a great mind becomes that which it meditates on." In other words, Coleridge recognises that the image he sees is an interaction of nature and his own eye; becoming a camera involves witnessing the spontaneous production of both. What else could Coleridge's "unregenerate mind" be shaping here but the equivalent of a desire to photograph, a desire to take his particular, evanescent and contingent vision of nature and, as Talbot later put it, have it "fixed for ever in the position which it seemed only destined for a single instant to occupy"?

This struggle to overcome the passing of time, to fix an image that would otherwise be temporary, can be found articulated throughout early nineteenth-century European culture. Compare Talbot's description of photographs, for example, to the description of landscape paintings offered in 1833 by English painter John Constable: "an attempt has been made to arrest the more abrupt and transient appearance of the Chiar'oscuro in Nature...to give 'to one brief moment caught from fleeting time' a lasting and sober existence, and to render permanent many of those splendid but evanescent Exhibitions, which are ever occurring in the changes of external Nature." Throughout the 1820s and 1830s, Constable produced a whole series of paintings of "skies." At first glance many of them appear to be pictures of nothing much at all. A thin horizontal strip of landscape anchors what is an otherwise empty sheet of paper or canvas, empty, that is, but for some rapidly applied strokes of paint meant to represent clouds scurrying about in the wind. These are, in fact, attempts on Constable's part to make time visible. The attempt can never quite succeed of course, as he implicitly acknowledges through the rapidity and insubstantiality of his paint-application, and his demonstrated need to paint this same subject over and over again. Time, it seems, stops for no man.

To a degree foreign to earlier generations of painters, Constable is interested in representing the reality of immediate and momentary perceptual experience. He deliberately shows us a landscape as it is being seen by an imperfect human eye rather than by the ideal, eternal gaze of God. He depicts what a particular person saw standing in a particular place at a particular time looking upwards at the sky under quite particular atmospheric conditions. The picture not only acknowledges and presumes the presence of this viewer; it puts that viewer firmly in place, inscribed as it were in the very fibre of its being. As Peter Galassi has argued in *Before Photography*, Constable was only one of many European artists working around 1800 who ventured out into nature to wrest permanent images from the contingencies of vision and time. Another was Louis

Daguerre. In 1822, two years before he commenced his photographic experiments, Daguerre and Charles Marie Bouton opened their Diorama in Paris. In the Diorama, viewers sat on a platform that slowly moved so that different views of the same painted scene, enhanced by special lighting and other effects, could appear to gradually reveal themselves. This apparatus was described by its inventors as "imitating aspects of nature as presented to our sight, that is to say, with all the changes brought by time, wind, light, atmosphere." Again, their interest is in the representation (that is, the fixing in place, in space) of transcience, of the capturing in pictorial form of the passing of time, of the momentary. Their interest, in other words, is in providing what we would now call a photographic mode of representation.

It has been suggested that photography's conception in the decades around 1800 emerged from a unique and complex confluence of social, cultural and technical developments. As a consequence, photography as a general historical phenomenon has to be understood not just as a new art form or a product of modern science, but as a conceptual consequence of dramatic shifts in our notions of representation, knowledge, power, and subjectivity.

GEOFFREY BATCHEN

See also: Daguerre, Louis Jacques Mandé; Talbot, William Henry Fox; Great Britain; France; United States; Brazil; Switzerland; Germany; Spain; Niépce de Saint-Victor, Claude Félix Abel; Niépce, Joseph Nicéphore; Wedgwood, Thomas; Davy, Sir Humphry; Morse, Samuel Finley Breese; and Daguerreotype.

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HISTORY: 2. 1826–1839

The period 1826-39 is dominated by the experiments and inventions of the French artist Louis Jacques Mandé Daguerre and his compatriot Joseph Nicéphore Niépce. By January 1826, when Daguerre wrote to Niépce about the possibility of fixing the images of a camera obscura, the latter had already worked out the fundamentals of his photographic process, which he called heliography. Niépce had begun experimenting with photochemical processes as early as 1816, achieved notable results by 1824, and produced the world's earliest extant stabilized camera image sometime in 1826–27 (*View from the Window at Gras*, Austin, Harry Ransom Humanities Research Center). Niépce visited Daguerre in Paris in August of 1827. He then travelled to London where he failed to interest the Royal Society in his heliographic process, which was based on the photosensitivity of bitumen of Judea, an asphalt used in printmaking. Unlike Daguerre, Niépce was concerned throughout his experimentation with the possibility of multiplying images through engraving. The earliest known image of this kind, an etching of a horse and its leader, was produced on a copper plate in July or August 1825 (Paris, Bibliothèque nationale). Several other plates, reproducing different prints through contact on various metals, have also survived, the most famous of which is the *Cardinal d'Amboise* (Chalon-sur-Saône, musée Nicéphore-Niépce). In order to reproduce engravings, Niépce varnished the back of a proof, thereby rendering it translucid. He then placed the print on a plate coated with bitumen. Upon exposure to light, the bitumen hardened under the un-inked areas of the print, but remained variably soluble under the inked areas. He then brushed the plate with acid diluted with water, which gradually attacked the metal, according to the thickness of the bitumen covering it. After repeated washes, he produced a reversed image etched onto the plate, which could then be used to print paper copies on an engraver's press. Niépce initially wished to engrave views produced on plates in the camera in the same way, although no such plates or proofs have been found. The *View from the Window at Gras* is rather a direct image obtained with bitumen on a pewter plate, which appears positive under raking light.

Before meeting Niépce, Daguerre had been working with phosphorescent materials in a camera obscura in an attempt to produce incandescent paint for his Diorama. The Diorama was a building designed by Daguerre that housed two large, semi-transparent paintings illuminated by natural light. Through the use of colored screens interposed between the paintings and the windows that lighted them, Daguerre achieved various effects of time, light, and movement in the painted scenes. He was an astute critic of Niépce's heliographic plates not only because of his extensive knowledge of lighting effects gained through the Diorama, but also from a solid understanding of printmaking techniques. Prompted by Daguerre's criticism of his photoengravings, Niépce focussed his attention after his return from London on camera images, which he called "*points de vue*." At Niépce's suggestion, the two men formed a company on December 14, 1829 in order to exploit the invention

of heliography, along with Daguerre's improvements to the camera obscura. By this date, Niépce had begun using iodine vapors to darken the light parts of camera images produced on silver plates, thereby restoring the normal relationship between light and dark that had been reversed in images in his earlier process. Daguerre preferred the quality of the original ("negative") image obtained on bitumen, and together they invented a new process that rendered a single, unique image, the physautotype. This process, based on the photosensitivity of the residue from oil of lavender dissolved in alcohol, resulted in an image that, like the daguerreotype, appeared either positive or negative depending on the angle of reflected light. After Niépce's death on July 5, 1833, Daguerre remained determined to perfect a process that would render a similar, unique image. He returned to the use of iodine, no longer as a darkening agent, but because of its photosensitivity when applied to silver plates as a vapor. This discovery led Daguerre to the invention of the daguerreotype process, in which mercury fumes brought out the latent image in the silver iodide on plates exposed to light in a camera.

Daguerre probably produced his first successful daguerreotypes as early as 1834 and announced his invention in the *Journal des artistes* on September 27, 1835. Daguerre had signed a new contract on May 9, 1835 with Niépce's son, Isidore. The new contract changed the name of the partnership from "Niépce-Daguerre" to "Daguerre and Isidore Niépce," in light of Daguerre's recognition of the chemical bases of the daguerreotype. A final contract was signed on June 13, 1837, naming Daguerre as the sole inventor of the new process, which was announced by the politician and scientist, François Arago, on January 7, 1839. Arago formally divulged the process to a joint meeting of the Académie des Sciences and Académie des beaux-arts on August 19, 1839, after King Louis-Philippe signed the law granting lifetime pensions to Daguerre and Isidore Niépce on August 7. Following Arago's announcement, Daguerre sent daguerreotypes to Ludwig I of Bavaria (Munich, Fotomuseum, Münchner Stadtmuseum), Ferdinand I of Austria, Nikolaus I of Russia, Friedrich Wilhelm III of Prussia, the Austrian chancellor Klemens Metternich (Prague, National Technical Museum), and Austrian ambassador to France A.G. Aponyi (Budapest, Museum of Science). Daguerre also offered daguerreotypes to Arago (Perpignan, Musée Hyacinthe Rigaud) and Alphonse de Cailleux (Paris, Société française de photographie).

Arago's announcement of Daguerre's invention in January 1839 provoked numerous claims of priority for other photographic processes, the most notable of which came from a member of the Royal Society of London, William Henry Fox Talbot. Talbot, a scholar known for his work in mathematics, presented examples of his photogenic drawings to the Royal Society on January 25, 1839, followed by a formal paper explaining his process on January 31. Talbot had first considered the possibility of fixing the images of the camera obscura in 1833. In 1834, he had developed both a form of cliché-verre, in which drawings scratched onto varnished glass plates were printed by contact onto silver paper, and photogenic drawings, in which the shadows of objects were imprinted through direct contact onto paper sensitized with silver nitrate. Talbot produced his first images in a camera in 1835, although these, like the contact images, had reversed light and dark areas. While he had already conceived of the idea of restoring the image to its proper disposition through a second contact printing, he did not pursue the idea of printing multiple positives from the initial paper print until the fall of 1840. At that time he began producing multiples by using the initial photogenic drawing image produced in the camera as a photographic negative, from which to make a positive image by taking a fresh piece of photogenic drawing and exposing it in contact with that negative. Until then, he was still attempting to meet the challenge posed by Daguerre, of producing a single image in which lights and darks could be perceived in their natural disposition.

Talbot's photographic process was not the only one in competition with the daguerreotype in 1839. The English physicist and astronomer John Herschel also invented several independent processes, including the cyanotype, and presented his paper on photography to the Royal Society on March 14, 1839. He is best known today, however, for having coined the term "photography" and for introducing sodium thiosulphate, or "hypo," as a fixing agent. Hercules Florence, a French immigrant living in Brazil, claimed to have captured images in a camera obscura by 1833, although he presented his findings only in October of 1839. Hippolyte Bayard, a French civil servant, invented an original process within the first few months of 1839 that rendered direct positives on paper. Although he received little support from Arago, Bayard's process received a favorable report in Paris from the Académie des beaux-arts, as did those of Talbot and an English engraver, James Tibbits Willmore. Willmore's process of "photogenic engraving," which was similar to Talbot's cliché-verre, was presented to the Académie des beaux-arts in April of 1839. In August of the same year, a French painter and drawing instructor, Auguste Berry, presented Arago with yet another photo-based process of producing multiples of original drawings. Such artistic applications were not pursued by the Académie des sciences, which rather supported Alfred Donné's use of the daguerreotype as an engraving plate for images taken through a microscope. Apart from Donné and the photoengraving process Hippolyte Fizeau used to print some of the plates of Nicolas Marie Lerebours' *Excursions daguerriennes* in 1841,

photomechanical printing would not be pursued seriously for another decade. These early attempts, along with silver-salt based paper photography, initially were eclipsed by Daguerre's process.

Many reasons exist to explain this triumph of the daguerreotype. The photosensitivity of silver nitrates had been known since the 18th c. and Thomas Wedgwood's experiments with the camera obscura at the turn of the 19th had been circulated through the scientific community by his friend Humphry Davy. Other experiments in the first decades of the 19th century (by Thomas Young in England and Samuel Morse in America, among others) are also documented. In 1839, then, the daguerreotype process not only seemed to be the most innovative but also, because of its precise detail compared to the first paper photographs, the most immediately useful in terms of scientific applications. Its most tangible scientific success in 1839 was in the field of miscroscopic photography, as practiced by Alfred Donné in Paris and John Draper in New York. Also in 1839, Daguerre's process was employed by Arago and Jean-Baptiste Biot to study the polarisation of light, and by Edmond Becquerel to study the effects of solar radiation. Conversely, the Académie des beaux-arts favored the more traditional processes on paper supports, whereas they dismissed any discussion of the daguerreotype in relation to art. Nevertheless, Daguerre's first images influenced the first generation of photographic artists, many of whom learned the daguerreotype process from the inventor himself during public demonstrations in September of 1839. Also beginning in September, Daguerre began giving weekly consultations to daguerreotypists at the Conservatoire des Arts et Métiers. He also oversaw the production of daguerreotypes at the shop of Alphonse Gustave Giroux, the son of his art dealer and the first manufacturer of daguerreotype equipment. These images produced at Giroux's shop, like the dedication plates Daguerre sent to European heads of state, comprised views of Paris and still-life arrangements of plaster casts, architectural fragments, bas-reliefs, and copies of sculpture.

Views of Paris, in particular vistas of the Louvre, Tuileries, or Notre Dame taken from bridges and buildings along the banks of the Seine, were among the first images produced by aspiring photographers and then exhibited in England, Belgium, Denmark, Poland, Germany, Italy, and the United States. The introduction of smaller, more portable cameras during the course of 1839 facilitated exterior photography. Architectural and city views also were improved through the use of prismatic lenses that corrected the lateral reversal of camera images, although many photographers, particularly in France, continued to produce reversed views. By November 1839, the artists Horace Vernet and Frédéric Goupil-Fesquet left France to photograph Egypt, where they encountered the Canadian, Joly de Lotbinière. Their original daguerreotypes of the Middle East, unlike those of Joseph Philibert Girault de Prangey from the early 1840s, have not been recovered, most likely because they were used in the production of etchings for the *Excursions daguerriennes*.

The widespread production of cityscapes and architectural views was partially due to constraints of the early daguerreotype process, before the use of accelerating substances made commercial portraiture feasible. While the same holds true for still-life arrangements of sculpture, it also can be said that such images fit within the growing 19th century concern with museums, collections, and the preservation of history. Daguerre created his still-lifes at the same time that the French government funded a plaster cast museum at the Ecole des beaux-arts and was considering a proposal for a new museum of French historical monuments. In his still-lifes, Daguerre sometimes included reproductions of sculpture from France or in French collections, such as Germain Pilon's *Les Trois Graces*, the 13th-century *Justice* bas-relief from the Saint-Etienne portal of Notre Dame cathedral, or the *Crouching Venus*, a version of which was installed at the Louvre in 1828. He also included sculpture not in French collections, and thus available only through copies or casts, such as a bust copied from the *Verospi Jove* at the Vatican or the *Venus de Medici*, which had been returned to Florence after the fall of Napoleon in 1815. These still-life combinations of sculpture from different periods and schools influenced many of the first daguerreotypists, including Alphonse Eugène Hubert, Alphonse Fortier, Baron Armand Pierre Séguier, and Bayard.

STEPHEN C. PINSON

See also: Daguerre, Louis Jacques Mandé; Niépce, Joseph Nicéphore; Daguerreotype; Talbot, William Henry Fox; Cliché-verre; Calotype and Talbotype; Herschel, Sir John Frederick William; Florence, Antoine Hercules Romuald; Bayard, Hippolyte; Donné, Alfred; Fizeau, Louis Armand Hippolyte; Morse, Samuel Finley Breese; and Girault de Prangey, Joseph-Philibert.

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HISTORY: 3. PHOTOGRAPHY IN THE 1840s

The British *Quarterly Review* of June 1842 wrote of "… those *new arts* which are on the eve of altering the forms and habits of social life." It listed railways, locomotive engines, tunnels, steam-boats, and steam-guns, improvements in gas-lighting, and lighthouses; the electrotype, voltaic gilding and plating, the electro-magnetic telegraph and the electromagnetic clock. Significantly, it went on to claim that these new arts, "…along with the Daguerreotype of Niépce and Daguerre and the Calotype of Mr Fox Talbot, constitute the leading inventions of the day," This is a revealing insight into the range and scope of technological innovation that was transforming the lives of millions of people during the first half of the nineteenth century, but also a reflection of the impact made on contemporary opinion by the invention of photography. Although the earliest images shown in 1839 were produced with difficulty and were far from perfect, they had been received with astonishment and delight. The decade that followed was a period of trial and experimentation as the first practitioners of the new art struggled to improve processes and techniques they imperfectly understood using equipment barely adequate for the task.

For a few months following the announcement of photography, there was considerable confusion about the nature of the two pioneer processes, which was not surprising as there were few examples of images from either process to be seen. Opportunities outside of the major cities were negligible. The English photographer, John Werge, later described how as a fourteen year old, hundreds of miles from London, he was " fired with a desire to obtain a sight of these "sun pictures" but the fire was kept smouldering for some time before my desire was gratified." By the beginning of 1840 however, more examples were becoming accessible to the public and the differences between the mirror-like images of the daguerreotype and Talbot's photogenic drawings on paper began to be appreciated. The highly polished metal plates of the daguerreotype image could contain exquisite detail but their soft surface required protection by glass and each image was a unique direct positive; no negative was involved. Talbot's images on paper were crude by comparison but, most importantly, his process involved production of a negative from which an almost unlimited number of positives could be produced. Both processes required long exposure times, which allowed only static subjects to be captured on plate or paper, even in ideal conditions. They were also imperfect in many other respects but both were soon dramatically improved.

Improvements to the daguerreotype process took place by a series of small steps. In London during 1840, John Goddard found that bromine vapour could be used to increase the sensitivity of the plates and Antoine Claudet discovered that mixtures of bromine and chlorine had the same effect. Similar discoveries were made independently in Vienna. The French physicist, Hippolyte Fizeau's method of toning with gold, which toughened the fragile surface of the daguerreotype plate and increased the contrast of the image, was another widely adopted innovation of 1840. Improvements were also made to daguerreotype camera lenses. Particularly significant was a lens designed by the Austrian scientist, Josef Max Petzval and manufactured for him by the optician, Peter Friedrich Voigtlander. The mathematically computed Petzval was a large aperture lens, twenty times faster than the lens fitted to Daguerre's original camera.

Talbot also worked hard to improve his photogenic drawing process and by the summer of 1840 had made some progress. Samples of his work received good reviews in the press and from his friends. Examples shown to the young Queen Victoria and her new consort, Prince Albert, were also favourably received. In September 1840 he discovered that by using gallic acid as a sensitising agent a latent image was formed, which could be developed to a visible image. This was a dramatic discovery that shortened exposure times to a few minutes, even seconds under ideal conditions. Talbot called his new process the calotype, which also became known as the Talbotype.

During 1840 it became evident that the improvements to both pioneer processes would allow the exciting prospect of commercial portrait photography to become a reality. In this application of photography, the New World was in advance of the Old. Americans became interested in using the daguerreotype process to capture living subjects as soon as full practical details became available in September1839. John W Draper and Alexander S Wolcott may have been successful within a month. It was certainly Wolcott who opened the world's first commercial photographic portrait studio in

March 1840. He was able to reduce exposure times by using an ingeniously designed camera, in which a concave mirror replaced the usual lens. Although this novel optical system restricted the plate size and the quality of the daguerreotype images left much to be desired, they were received with enormous enthusiasm. Wolcott's system was taken to London by his partner's father, William S.Johnson, who entered into a partnership with Richard Beard, a coal merchant and patent speculator. Beard was a licensee for Daguerre's English patent for the Daguerreotype process and in June 1840 he also took out an English patent for Wolcott's camera design. The system was further improved by incorporating Goddard's bromine accelerating process. In March 1841, Beard opened Europe's first daguerreotype portrait studio at the Royal Polytechnic Institute in London's Regent Street. In what was then the richest city in the world, such a novelty meant that success was almost certainly assured. A review in *The Spectator* noted "if the charge be moderate…thousands will flock to the Polytechnic portrait room and the patentee, Mr Beard, will make a fortune." Thousands did flock and Beard did indeed make a fortune. Three months after Beard's opening, Antoine Claudet opened a rival daguerreotype studio on the roof of the Adelaide Gallery in London. Other studios followed and within a few years almost every major town in Britain had its daguerreotype portrait studio. Similar events took place in France, the home of the daguerreotype. Paris became the world's centre of excellence for daguerreotype equipment and materials. It was the introduction of the Petzval portrait lens that promoted the establishment of daguerreotype portrait studios in Austria and Germany, where they were again received with acclaim. Daguerreotype portraiture became a world wide phenomenon. By the end of the decade, studios were operating as far away as India and Hong Kong.

The American people's enthusiasm for the minute detail of the daguerreotype was unrivalled. As in Europe, many early commercial practitioners saw photography as a lucrative sideline to a more traditional trade and the quality of early portraits was often poor. This did little to dampen enthusiasm and quality improved as the more skilful operators became established. From the early 1840s, businesses such as the galleries of John Plumbe and the partnership of Albert Southworth and Josiah Hawes began earning reputations for high quality. One of the most distinguished names in American photography, Matthew B. Brady, opened a daguerreotype studio in New York City in 1844. By the end of the decade American daguerreotypes were beginning to be recognised as the finest in the world. The calotype process was never widely practised in America. William and Frederick Langenheim, who had been operating a daguerreotype studio in Philadelphia since 1841, purchased rights to the calotype from Talbot in 1849. They were enthusiastic about its prospects but totally failed to convince American customers of its merits.

In England, Talbot had harboured hopes that calotype portrait studios could emulate the popularity of the daguerreotype studios. In August 1841 he licensed the first professional calotypist, Henry Collen, a miniature painter by profession. The first press reviews of Collen's portraits in the spring of 1842 were generally favourable. The *Morning Post* reported that " The portraits, those at least we have seen, are very satisfactory. There is a rough air of truth about them, which reminds one of the first, and sometimes the best, sketches of the artist…." Emphasising the one great advantage the calotype enjoyed compared to the daguerreotype, the *Gentleman's Magazine* noted, "the likenesses produced by Mr Collen of Somerset Street, may be multiplied to any extent." However, calotype portraiture failed to capture public imagination. Possibly this was because neither Talbot nor Collen displayed any flair for business but even when the fashionable daguerreotypist, Claudet, was licensed to take calotypes, there was little interest.

Talbot showed that the calotype process could be a suitable medium for portraiture by making charming private portraits of his family and friends but perhaps the most convincing proof was provided by two Scottish calotypists, Robert Adamson and David Octavious Hill, who became partners in 1843. Adamson was responsible for technical matters, the chemistry and manipulation, while Hill looked after the artistic side of the business, posing the sitters, backgrounds and lighting. Until Adamson's death in 1848, they produced around 1,500 calotype portraits and groups, which most modern commentators accept are amongst the most masterly images of the decade. Hill, a painter, was a champion of the artistic qualities of the calotype process. He had little time for what he called " the livid pictures of Daguerre."

In 1844 Talbot set up a calotype printing establishment at Reading where he produced the world's first commercial photographically illustrated book, *The Pencil of Nature*. During the next three years, Talbot used the Reading establishment to produce enormous numbers of prints from his own negatives and those of his friends and associates. Amongst the most interesting are Talbot's London views, the earliest important photographic record of a great city. Photography on paper was most popular amongst Europeans and particularly the gentleman amateur photographers in Britain. Many of these early calotypists were part of Talbot's circle of family and friends. They included, his Welsh cousin, Christopher Rise Mansel Talbot, cousin by marriage, John Dillwyn Llewellyn, the Reverend Calvert Richard Jones and the Reverend George Bridges. The calotype process was also widely practised in France, particularly after the introduction of Louise-Desire Blanquart-Evard's improved method announced in 1847.

Hill, David Octavius; Robert Adamson. David Octavius Hill. *The Metropolitan Museum of Art, The Rubel Collection, Purchase, Lila Acheson Wallace Gift, 1997 (1997.382.8) Image © The Metropolitan Museum of Art.*

It was quickly recognised that a public who travelled little and were used to seeing strange and exotic foreign lands solely through the eyes of an artist would be fascinated by foreign photographic views. As early as 1839 a French journalist had written, "travellers may perhaps soon be able to procure M. Daguerre's apparatus and bring back views of the finest monuments and of the most beautiful scenery of the whole world." From Paris, Noel P Lerebours commissioned and collected daguerreotypes from all over the world and is reputed to have acquired more than a thousand pictures of foreign lands. The British were particularly prominent in the Mediterranean regions. During 1840 and 1841 Dr. Alexander John Ellis took over 150 Italian views using Daguerre's original process. Talbot's associates, Calvert Jones and George Bridges took scores of calotype views of Malta, Italy and the Holy Land in 1845–46, many of which were printed at the Reading Establishment. In America, the Niagara Falls was a popular subject for daguerreotypists from as early as 1845. Commerce may have been the driving force for much of the above work but in an age of exploration and empire, photography was beginning to be seen as having other applications. Edward Anthony was reported to have been asked to make daguerreotypes of parts of the north-east boundary of the United States as aids to resolving a frontier dispute with Britain. In India, John McCosh practised calotype photography while serving as a surgeon in the East India Company's army during the Second Sikh War (1848–49) and wrote 'I would strongly recommend every assistant surgeon to make himself master of photography in all its branches.'

The scientific community of the 1840s was deeply involved in photography, both in furthering its progress

and in applying it to science. Talbot, Sir John Herschel and Sir David Brewster in Great Britain, Jean Baptiste Biot, Hippolyte Fizeau, and Leon Foucault in France, and Samuel Morse and John Draper in the USA, are just some of the scientists that made invaluable contributions. Much of scientific work involves careful observation and the potential of photography to be an invaluable aid to the information gathering, analysing, recording, and storing process was immediately recognised. Anna Atkins' privately printed *British Algae: Cyanotype Impressions*, was a collection of contact impressions produced in what later became known as the 'blueprint process,' invented by Herschel in 1842. Issued in parts between 1843 and 1853, it was possibly the first serious application of photography to scientific publication. The study of the infinitely small and infinitely distant were revolutionised by photography. Talbot's first views through a microscope were made in the 1830s, as were daguerreotype specimens by the Frenchman, Alfred Donne. In 1844 Donne, with Leon Foucault, was able to produce daguerreotype plates of blood cells as an aid for illustrations for an atlas of microscopic anatomy. As the 1840s progressed increasing numbers of investigators using both of the major processes produced photomicrographs of an astonishingly high quality. John Draper at New York University made the first recorded photograph of the moon through a telescope in 1840 and two years later made a daguerreotype of the spectrum of the sun. During the next few years, several photographers recorded solar and lunar eclipses. As Talbot perceptively wrote to Herschel as early as 1841, "there appears to be no end to the prospect of scientific research which photography has opened out."

The great debate as to whether photography was itself an art began during the 1840s. During its early days, photography was widely termed "the new art" but that did not mean that it was automatically seen as being artistic. In the 1840s the word art had a wider application than is common today and was applied to any number of skills, crafts, practices and industrial pursuits that would not now be accepted as artistic. Nevertheless, in high art's Romantic period, perhaps photography had that hint of mystery that appealed for the influence of painters on early photography was immediate and profound. Unsurprisingly, paintings and drawings influenced the composition of many early photographs. As Hill demonstrated, an artistic eye could be a great asset, even to a commercial photographer. Many painters took up photography; some practised their traditional skills alongside photography. A host of minor artists were used to hand colour daguerreotypes; photographs on paper were also sometimes coloured or retouched by hand. Photography was widely used to copy works of art and was to become a major factor in the popularisation of art during the nineteenth century.

By the end of the 1840s, photography was firmly established and becoming organised. Patent restrictions in England were irksome but that was a problem for the next decade. The first photographic societies were being formed and a growing number of people, albeit from a limited privileged group, were practising photography as a hobby. People were becoming more used to seeing photographic likenesses and to appreciate that photography could represent the world around them with an accuracy undreamed of by previous generations. After the rapid improvements earlier in the decade, technical development was steady rather than spectacular. The typical camera still resembled the pre-photographic camera obscura but was usually purpose built and professionally made. The home-made cigar box and spectacle lens type of instrument described by Draper in 1840 was likely to have been discarded. A new industry was growing up as certain chemists and instrument makers began to specialise as photographic manufacturers and dealers. By 1847 the London dealer, Horne, Thornthwaite and Wood, was advertising a range of over a dozen cameras with prices ranging from a guinea to forty pounds. Improved lenses were being offered although the Voigtlander Petzval remained highly regarded. The anonymous author of a British manual, *Photography Made Easy* (c 1845), complained of "no English lens being at all comparable, as we believe, with the Voigtlander for inducing beauty of detail, correct delineation, or, indeed, rapidity of operation." Alternative processes were suggested but advantages over the processes devised by Daguerre and Talbot were minimal. The direct positive process on paper announced by the Frenchman, Hippolyte Bayard, in 1839 received no support in France and had no influence on the development of photography. Abel Niépce de St-Victor's albumen on glass process of 1847 was a step into the future but, again, was not widely influential. The typical photographs throughout the 1840s were the finely detailed daguerreotype images on metal by the professional portrait photographer and the coarser calotype images on paper favoured by the amateur or where numerous duplicates were required.

In the wider world, photography was born into an age of change, uncertainty and social unrest, partly driven by rapid technological innovation. During the 1840s, there was economic depression in Europe and America. There was famine and riot in Great Britain, revolution in Paris and Vienna, and war with Mexico in the United States. Yet the technology driving this change, was also creating the seeds of recovery and prosperity. This was the great age of the machine and steam power. Railways were opening up countries and continents to new goods and new cultures. Against this background photography survived and thrived. Despite the problems, the pio-

neers succeeded in laying the foundations of modern photography. They left a multitude of striking images as evidence of their skill and vision as well as a unique record of the age. The end of the decade was a turning point for the world economy as trade increased and prosperity improved. It can also be seen as a turning point for photography. During the 1840s, photography had been enthusiastically received by the educated and the fashionable but for great masses of the population, it remained just one of many novelties of an innovative age. In the early 1850s technological change brought a new process that was to displace the pioneer processes from favour and bring photography to the attention of a wider public than ever before.

JOHN WARD

See also: Daguerreotype; Niépce, Joseph Nicéphore; Calotype and Talbotype; Talbot, William Henry Fox; Werge, John; Goddard, John Frederick; Claudet, Antoine-François-Jean; Fizeau, Louis Armand Hippolyte; von Voigtlander, Baron Peter Wilhelm Friedrich; Victoria, Queen and Albert, Prince Consort; Beard, Richard; Southworth, Albert Sands, and Josiah Johnson Hawes; Plumbe Jr, John; Brady, Mathew B; Collen, Henry; Hill, David Octavius, and Robert Adamson; McCosh, John; and Biot, Jean-Baptiste.

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HISTORY: 4. 1850s

The 1850s were, arguably, the most important years in the establishment of photography in both Europe and America, and during that decade, some of the finest photography of the Victorian era was produced. Many of the key applications of the medium were introduced and developed, the photographic press was established, and the world's first photographic associations were set up.

The decade opened with the high cost daguerreotype being used to make 'likenesses' for the rich, and ended with the ubiquitous carte-de-visite—which would eventually bring portraiture within the price range of everyman—definitely in the ascendancy.

The daguerreotype and the paper negative were the two dominant processes as the decade opened, and predictions of the immediate demise of the daguerreotype were to prove considerably premature. Writing in 1850 on the future of photography, Baron Jean Baptiste Louis Gros—who in the following year would become a founding member and the first President of France's Société heliographique—asked, "Is it not easy to foresee that the daguerreotype has almost run its course, and that its rival on paper is destined by its indisputable advantage to carry the day against it?" While many recognised that the negative represented photography's future, opinions varied on whether paper or glass constituted the ideal carrier for the negative image. Gustave le Gray, quoted in the English translation of his pamphlet *A Practical Treatise on Photography upon Paper and Glass*, also in 1850, observed that, "The future and extensive application of photography will doubtless be confined to the paper process and I cannot too much engage the amateur to direct his attention and study to it. The negative proof on glass, it is true, is finer, but I think it is a false road and it would be much more desirable to arrive at the same result with the negative on paper."

As the decade unfolded, neither prediction would prove to have been especially perceptive, nor immediately likely to come to pass. Many of those who would are today considered to be amongst the daguerreotype's most articulate exponents had not yet entered the arena at the time of Gros's remarks, and despite the paper negative evolving considerably throughout the decade in Europe, it would ultimately be 'the negative proof on glass' which would win the day.

In the United States, the daguerreotype reigned supreme and almost unchallenged in the early 1850s. Attempts to introduce Talbot's calotype into America had met with only very limited success, although some photographers persevered with the process into the early 1850s, eventually attracting praise for their achievements. Roger Fenton attributed the phenomenal growth of photography in the 1850s—especially in Britain—directly to the impetus generated by its

inclusion in the Great Exhibition at the Crystal Palace, London, in 1851. The restrictive effects which Richard Beard's patents had imposed on the development of photography in Britain were underlined when the three prizes awarded by the jury at the Crystal Palace all went to American photographers—Matthew Brady, Martin Lawrence and John Whipple.

The *Illustrated London News* described the American daguerreotypes—some of them more than 12 by 10 inches in size—as 'super excellent' while the American response was an unequivocal 'in daguerreotypes we beat the world.' John Werge later attributed the American successes to the fact that they could buff their daguerreotype plates without leaving marks on the delicate silver surface which, he insisted, most British practitioners could not.

Writing in his book *The Evolution of Photography* in 1890, Werge recalled his visit to the Hyde Park Exhibition—coincidentally his first visit to London

> After a night's rest, which was frequently broken by cries of "Stop thief!" I arose and made an early start for the Great Exhibition of 1851. Of all the wonderful things in that most wonderful exhibition, I was most interested in the photographic exhibits and beautiful specimens of American Daguerreotypes, both portraits and landscapes, especially the views of Niagara Falls, which made me determine to visit America as soon as ever I could make the necessary arrangements.
>
> While examining and admiring these very beautiful Daguerreotypes, I little thought that I was standing, as it were, between the birth of one process and the death of another; but so it was, for the newly born collodion process very soon annihilated the Daguerreotype, although the latter process had just reached the zenith of its beauty. In the March issue of the *Chemist*, Archer's Collodion Process was published, and that was like the announcement of the birth of an infant Hercules, that was destined to slay a beautiful youth whose charms had only arrived at maturity. But there was really a singular and melancholy coincidence in the birth of the Collodion Process and the early death of the Daguerreotype, for Daguerre himself died on July 10th 1851, so that both Daguerre and his process appeared to receive their death blows in the same year.

Forty years after the event, Werge's memory of the early 1850s was imperfect. The daguerreotype and the collodion process, together with countless variations on the paper negative, co-existed in the British and European markets for many years after Daguerre's death. In April 1853, he did realise his ambition, and set sail from South Shields to the United States, where he practised as a daguerreotypist with a number of American studios. Despite his recollections of the process's almost-immediate demise, he himself did not abandon the daguerreotype until 1857.

Of British daguerreotypes in the Crystal Palace, Werge made not a mention. The smaller number of English practitioners at the time, limited by Beard's imposition of a geographical licensing regime must, however, have played its part. Britain was the only industrial country where the process was so strictly controlled.

While the Crystal Palace was only one of the influences which fuelled interest in the medium, it was, however, as a direct consequence of that display that Fenton and others organised the world's first exclusively photographic exhibition at London's Royal Society of Arts in December 1852. With interest in photography fuelled by the Great Exhibition, the organisers of that 1852 exhibition at the Society of Arts must have felt assured of wide coverage in the journals of the day.

The exhibition was large, and the *Illustrated London News* was not entirely supportive of the selection, noting, in the issue for New Year's Day 1853 that

> The works of Mr Fenton, Sir William Newton, Mr Shaw, Mr Goodeve, Mr Archer, Mr Horne and Dr Diamond are, with several others respectively, examples of much interest. Many among them are pictures of exceeding beauty, and curiously suggestive; but many would not have passed beyond the portfolio of the artist, since the subjects have been badly chosen and the results obtained are very unsatisfactory. Mr Fenton, on the occasion of the opening the exhibition, read a paper on the 'Present Position and Future Prospects of the Art of Photography' in which he sketched briefly the present state of our knowledge, and judiciously pointed out the most important points for research. 'Though the excellence of the specimens now exhibited' says Mr Fenton, 'might allow photographers the indulgence of self-complacency, still everybody feels that, as an art, it is yet in its infancy, and that the uses to which it may be applied will yet be multiplied tenfold'.

The lack of selection of subject, of viewpoint, and of lighting conditions were failings to which many photographers succumbed throughout the 1850s, an era when the successful navigation through the complexities of the procedures was often seen as justification in itself for exhibition. Photographers who saw the medium simply as a technical challenge would increasingly attract the wrath of writers and lecturers. In a lecture to the Manchester Literary & Philosophical Society in April 1856, the disdain in remarks made by James Mudd echoed with a resonance which continued for years. Mudd stated, "Nature does not show her loveliest things to such careless seekers; and if she did they could not see, for they have not the educated eye to discern them. These are the mechanical workers who believe that processes, lenses, and apparatus make pictures."

Much of the photography in the exhibition was by le Gray's waxed paper process, while the majority of images had been produced by the full range of paper negative processes then available. A smaller proportion

Fenton, Roger. The Wharfe and Pool Below the Stride.
The Metropolitan Museum of Art, Gilman Collection, Purchase, W. Bruce and Delaney H. Lundberg Gift, 2005 (2005.100.8) Image © The Metropolitan Museum of Art.

were taken with wet collodion, the process relatively newly introduced by Archer, and the one British-invented process which, at the time, all believed would be free of patent restrictions. Talbot's legal proceedings against Martin Laroche and other wet collodion users for claimed infringements of his calotype patent would be initiated in 1854.

In America, where the daguerreotype had reigned supreme for so long, even writers such as H. H. Snelling were (perhaps grudgingly) changing their opinions about the potential of the paper negative. Writing in the *Photographic Art Journal*, at the end of 1852, Snelling conceded that, "if we are to judge from the constantly increasing demand for photogenic paper and paper chemicals, it will not be long before photography on paper will be as extensively practiced as the daguerrean art. The beautiful results obtained by Messrs. Whipple and Black, of Boston, have undoubtedly contributed to enhance the interest in the paper processes." The writer made no attempt to conceal his opinion of the standards of work being produced on the eastern side of the Atlantic, continuing

> These gentlemen have produced proofs upon paper far excelling any of those coming from either English or French manipulators. We consider them superior, because they come from their hands in a finished state, fine in tone and softness, excellent in color, and almost perfect in outline, soundness and perspective, without the aid of the brush, which cannot be said of the European photographs, they being more or less retouched.

In an intriguing twist to the evolution of photography in America where the daguerreotype had always been practised freely, James Ambrose Cutting was granted a patent for a slight variation on Archer's collodion negative and positive processes in 1854, and through it attempted to control the development in America of the one process which was, after the collapse of the action against Laroche, freely available elsewhere at the time. It took fourteen years for the issue to be resolved in

the American courts, and for Archer's process—given freely to the world—to be freely available in the New World.

The initial announcement of Archer's wet collodion process, however, and the dramatic improvement in image clarity which that process permitted, was at least as important a trigger as the Great Exhibition in launching photography as a mass medium. Of similar importance was the introduction of Blanquart-Evrard's albumen printing paper—although it would be the early 1860s before that became widely used outside Europe.

Blanquart-Evrard's printing establishment in Lille, the "Imprimerie Photographique" that opened in the summer of 1851, was where some of the finest photography produced in France during the decade was actually printed. That printing works produced, amongst many others, the magnificent albumen prints from Maxime du Camp's pioneering 1852 journeys through Egypt, Nubia and Palestine, and John Beasley Greene's 1854 journey up the Nile, as well as many magnificent architectural views by Bisson Frères and others.

Upwards of thirty local women were employed in printing tens of thousands of prints per year, and the combination of albumen paper, rapid printing times and cheap labour, enabled the factory to reduce the unit price of an albumen print to less than a tenth of the cost of a salt print.

When the factory closed in 1855, Blanquart-Evrard moved to Jersey, where he opened a new factory in collaboration with Thomas Sutton who, in 1856, would become the founder–editor of the influential, if rather opinionated, magazine *Photographic Notes.*

Albumen paper, gold-toned as an aid to permanence, defined the photographic image of the 1850s, 60s, and 70s. It also marked photography's first tenuous step into the world of mass production. Albumenised paper—already coated with albumen, and needing only to be rendered sensitive to light—became commercially available in the mid-1850s, and relieved photographers from one of the many tasks involved in the preparation of their materials.

Given the enhanced detail and sumptuous tonal range of the albumen print produced in capable hands, Fenton's decision to stick with the tried-and-tested salt print for his 1855 Crimean oeuvre is perhaps surprising.

Had the albumen print not been introduced, the multiplication of the photographic image would have been severely impaired, and the growth of photography undoubtedly slowed down. Collodion and albumen, despite the intricacies of the former, were the combined keys which unlocked photography's potential, and both were born at the start of the decade.

Interestingly, while the majority of photographers and photographic printing establishments used it as a printing-out paper, Blanquart-Evrard conceived albumen as a developed paper, requiring much shorter exposures, and considerably increasing the number of prints which could be produced in a day. His Lille printing establishment was one of only a very few places where the developed albumen print prevailed.

The complexity of the collodion process, and the availability of only a few published manuals on photography, was an obvious encouragement for photographers to get together to share technical information. That practice had been established for several years in Britain—the Photographic Club, often referred to as the Calotype Club, had evolved in the 1840s as an informal gathering of like-minded photographers enthusiastic about sharing information. Amongst its early participants, Peter le Neve Foster, Peter Wickens Fry and others would, in 1853, be instrumental in establishing Britain's first photographic association.

Most of the formal photographic organisations grew out of informal groupings of similar like-minded photographers who saw the sharing of information and ideas, both technical and aesthetic, as being essential elements in the development of the medium.

America's first attempt at setting up a photographic association was initiated in July 1851, with the inaugural meeting of the New York State Photographic Association, later known as the New York State Daguerreian Association. The rival American Heliographic Association was set up three days later, quickly changing its name to the American Daguerre Association, with Jeremiah Gurney as its first chairman, and Albert Southworth amongst its founding members. The two associations reportedly developed an acrimonius relationship—with the American Daguerre Association being branded a 'secret society' by some of those excluded from membership. Despite its title the ADA was not a national organisation. By 1854 both associations has ceased to exist.

France's first society, the Société héliographique, enjoyed only a similarly short existence, being superseded in 1854 by the Société française de photographie. In Britain, however, the Photographic Society of London—which later changed its name to the Royal Photographic Society of Great Britain—established in 1853 by Fenton, Claudet, and others, had enjoyed more than a century and a half of uninterrupted activity.

1852 was, in most parts of the photographic world, a watershed year. It was the year which saw the start of widespread acceptance of the wet collodion process, and the glass plate replacing the paper negative in all but a few areas of operation. One of the exceptions was in photography far from home, where the transportation of the bulky paraphernalia of collodion photography was not immediately practicable. Thus Fenton and John Cooke Bourne travelled to St Petersburg, Moscow and Kieff in the autumn of 1852 with pre-prepared waxed

paper negatives for their pioneering industrial photography project on the construction of Charles Vignoles' suspension bridge over the River Dneiper. Even so, their cameras and ancillary equipment, according to Vignoles' diaries, filled two coaches on the railway journey from St Petersburg to Moscow.

Gustave le Gray and O. Mestral used le Gray's waxed paper process for their contributions to France's *missions héliographique*, and Dr. Thomas Keith used his variant on the same process to create a significant body of soft romantic views of Edinburgh and central Scotland. In America Victor Prevost was probably the first of a very small group of photographers to experiment with le Gray's process.

One application where the glass plate was slow to gain acceptance was high-class studio portraiture, where the daguerreotype endured for several years into the so-called "collodion era" in Europe, and even longer in the United States. Leading photographers in Paris and London stayed loyal to the process well through the decade. Antoine Claudet, William Kilburn, and T. R. Williams, amongst others, produced some of their finest daguerreotype portraiture in the mid 1850s, many of them stereoscopic.

The stereoscopic daguerreotype also played a prominent role in the commercial photography of the Exposition Universelle in Paris in 1855. But while the great portraitists displayed their names prominently on labels on the reverse of their work, the photographers who produced multiple views of the great halls and gardens of the Exposition remained largely anonymous.

For photography's first decade, camera design had evolved little. Cameras for large format paper negatives were constructed as larger versions of the small sliding box cameras used for daguerreotypes. In a number of Roger Fenton's photographic views in Kyiv, these large instruments can be clearly seen, and their weight must have been considerable.

But with the granting of an American patent to William Lewis in November 1851 for a new daguerreotype camera, a feature was introduced which influenced large format camera construction for a century. The considerable weight and bulk of the simple sliding box design of instrument was dramatically reduced by the introduction of square-section concertina bellows. The 'tailboard' design of camera had arrived.

A plethora of lighter-weight camera designs followed, and for photographers who used le Gray's waxed paper process—which allowed negative papers to be prepared days in advance—the weight of equipment the photographer had to carry when working in the field seemed destined to reduce considerably. However, with many photographers converting to collodion as soon as Archer's process became known, all such weight benefits were quickly cancelled out, triggering the design and marketing of a wide choice of backpacks, wheelbarrows, and other means of transporting darktents and all the other paraphernalia of the wet plate.

In a short presentation to the recently formed Photographic Society of London on 21 April 1853, Marcus Sparling, later Fenton's assistant in the Crimea, demonstrated Major Halkett's design for a large format 11x8 inch field camera, fitted with a conical India-rubber tube connecting lens panel with back standard, and remarked that, "the camera sent by Major Halkett is not a new one, but has been now for some years in use in the army in most parts of England and Ireland." The use of a flexible material in this way was not new. Richard Willats had exhibited a camera with a fabric body at the Great Exhibition, and although the source of the army design is unknown, it may well have been developed from Willats' prototype.

The ingenious construction of Halkett's camera, however, permitted the use of rising front for perspective control, and combined lightness of weight with a collapsible design which enabled it to be folded down into a very small unit packed in a small bag for ease of transportation. Scottish photographer Charles Kinnear's design of 1856–1857 for a lightweight camera for the travelling photographer introduced tapered bellows for the first time, as well as several other features which became standard.

The photography of the Crimean War (1854–1856) was one of the milestone's of the decade, albeit after a somewhat hesitant start. The ill-fated Richard Nicklin, and the unsuccessful military photographers Ensigns Brandon and Dawson were followed by photographers of several nationalities who ensured that, while photographs 'of war' were still a practical impossibility, the camera 'at war' established itself as a potent illustration medium.

Historically, accounts of photography in the Crimea are dominated by Roger Fenton, but he was just one of many. The Romanian Carol Popp de Szathmari, the Frenchmen Colonel Charles Langlois, George Shaw Lefevre (Baron Eversley), Léon-Eugene Mehedin, Pierre Lassimonne, and Jean-Baptiste Durand-Brager, the German Friedrich Martens, and British born James Robertson, then resident in Constantinople, all contributed to a very rich legacy of images taken during and immediately after the conflict. The Russian author Leo Tolstoy is also believed to have photographed in Sevastopol at the time of the lengthy siege of that city.

Other photographers added to the story. The British photographers Joseph Cundall and Robert Howlett photographed soldiers before they embarked for the war zone—and published them as *Crimean Heroes* and *Crimean Braves*—while le Gray and Nadar did the same for French commanders and officers. At the cessation of hostilities, Parisian portrait photographers Mayer & Pierson photographed the signing of the peace treaty.

As far as the general public was concerned, their only contact with these photographs was via wood block illustrations drawn from photographs in journals such as the *Illustrated London News*. However important the coverage of the war was in the history of photography, it was not a commercially viable proposition. The length of time taken to make the thousands of prints from Fenton's negatives delayed publication of the portfolios, and the publishers Agnew, Colnaghi and others were left with hundreds of unsold prints when interest in the war finally faded.

Other major publishing projects achieved much greater success. Francis Frith's series of photographs of Egypt, Nubia and the Holy Land taken in 1856–59, published by James Virtue, sold in large numbers. Indeed the photographic exploration of the Nile valley, inspired by the work of the late 18th century French scholars who first explored the region, and later by eminent painter David Roberts RA, did much to demonstrate the value of photography as an aid to scholars. Frith may have taken his camera further up the Nile than anyone before him, but the majority of his travels were in the footsteps of, amongst others, Frenchmen Maxime du Camp (1850–52) and Félix Teynard (1851–52) the American John Beesley Greene (1854).

The 1850s was the decade which saw the foundation of the photographic press. As much of the development of the medium was driven by debate, discussion and the sharing of information—carried in general interest magazines through the 1840s—the emergence of journals specifically devoted to photography was an obvious progression. In Britain, journals like *Notes & Queries* had established themselves as conduits for the exchange of information on photography, but the first dedicated photographic periodical emerged not in Britain but in the United States.

The Daguerreian Journal first appeared in January 1850, but within little more than two years had changed its name to *Humphrey's Journal*, becoming one of the most influential photographic publications over a period of two decades, before folding in 1870.

The Photographic Art Journal first appeared a year after *The Daguerrian Journal*, also later changing its name—to *The Photographic and Fine Art Journal*. An early issue in 1851 carried an article on Matthew Brady, noting that, due to failing eyesight, Brady was not himself taking pictures, but concentrating on running his business.

In France, the proceedings of the Société héliographique, formed in 1851, were published in *La lumière*, and once Ernest Lacan had taken over as editor in late 1851, the journal became, for a time, the authoritative voice of organised French photography.

The first British periodical devoted specifically to photography was the *Journal of the Photographic Society of London*, which was published for the first time on March 3 1853. In his opening remarks on the purpose of the journal, carried in its first issue, Roger Fenton made an oblique reference to *La Lumiére* and the London society's journal was clearly modelled on what he knew of its French counterpart. For several years, translations of key articles published in Paris were carried in the pages of the *Journal of the Photographic Society*, widening yet further the interchange of ideas. Through a number of slight name changes, it has endured for over 150 years and is still published today as the *RPS Journal*.

It was followed in 1854 by the first issue of the *Liverpool Photographic Journal*, which became the *Liverpool and Manchester Photographic Journal* and briefly *The Photographic Journal* before eventually becoming the *British Journal of Photography* by the end of the decade. Under that name it still thrives today and it too has a record of more than a century and a half of continuous publication.

Thomas Sutton's *Photographic Notes* published its first issue in 1856. *The American Journal of Photography and the Allied Arts and Sciences* was first published on June 1 1858, and across the Atlantic in Britain, *Photographic News* first appeared in September of that year.

If, as was generally the case, the emerging photographic press largely confined itself to dealing with the technical and scientific manipulation of the medium, and the myriad variations on every available process, other writers did introduce critical discussion of photography's ability to capture a realistic, pleasing and satisfying chiaroscuro, and its claims to be accepted as an art form. Attempts to reconcile science, technique and aesthetics when discussing photography were only sometimes successful.

Writing in the *Journal of the Photographic Society* as early as 1853, John Lieghton attempted to identify the challenge facing photography's attempts to be accepted as 'art.'

> Fine art seeks to elevate the imagination by lofty images derived from nature in its most agreeable forms. Nature may be and is conventionalized in the noblest and highest and highest art; the abstract is given without the minutiae. In photography this is reversed; breadth being sacrificed to detail. For purposes of science, however, for example, for natural history, for the architect also, or the engineer, the utmost detail obtainable in a photograph is advantageous; but the artist will not descend to minutiae; he desires breadth of effect; "his most perfect pictures may be out of focus, his distances may fade away, his foregrounds look indistinct, his trees may appear in masses, and his figures may be obscured by positive shades."Photographic pictures are at present too literal to compete with works of art.

Eugéne Durieu, writing in 1855 summed up photography's dilemma:

> As it reproduces pictures of nature with extreme accuracy, and often with a perfection and finish that the cleverest draughtsman would not know how to achieve, those who see in art only an imitation of nature have had to accept photography as the final and most complete expression of art. Many, therefore, have allowed themselves to be seduced by this idea and, applying themselves to the mechanical side of reproduction, they believe they have in photography reached the extreme limits of perfection, when they have managed to fix on the paper a sharp, clear image, finely detailed, of some scene. The more exact the copy is, the more it seems to them they have succeeded.

One of the seminal discourses on photography in the 1850s was written by Lady Elizabeth Eastlake in 1857, and published, unattributed, in the *London Quarterly Review*. Her husband, Sir Charles Eastlake was, at the time President of both the Royal Academy, and the Photographic Society of London. In a perceptive essay, and drawing on her understanding of Hunt's writings on the actinic values of light, she observed that

> So impatient have been the blues and violets to perform their task upon the recipient plate, that the very substance of the colour has been lost and dissolved in the solar presence; while so laggard have been the reds and yellows and all tints partaking to them, that they have hardly kindled into activity before the light has been withdrawn.
>
> Thus it is that the relation of one colour to another is found changed and often reversed, the deepest blue being altered from a dark mass into a light one, and the most golden-yellow from a light body into a dark.
>
> It is obvious, therefore, that however successful photography may be in the closest imitation of light and shadow, it fails, and must fail, in the rendering of true chiaroscuro, or the true imitation of light and dark.

Despite her clear understanding of the limitations of the 'ordinary' blue sensitive emulsions of all the early processes, Lady Eastlake went on to overlook those same failures which she had just been considering

> And this brings us to the artistic part of our subject, and to those questions which sometimes puzzle the spectator, as to how far photography is really a picturesque agent, what are the causes of its successes and its failures, and what in the sense of art are its successes and failures? And these questions may be fairly asked now when the scientific processes on which the practice depends are brought to such perfection that, short of the coveted attainment of colour, no great improvement can be further expected.

More than a decade and a half would pass before the spectral sensitivity of plates was extended—thanks to Hermann Vogel's discovery of dye sensitisation in 1873—but despite the limitations of negative materials sensitive to only blue and violet, some of the finest photography of the nineteenth century had already been created by the time Lady Eastlake wrote her essay.

The decade thus saw the emergence of debate about whether or not photography was an art or a science, about what constituted an artistic photograph, and whether or not the true art of photography was the 'perfection' with which it could replicate nature. While many proposed that to be accepted as an art, the new medium ought to borrow the traditions and trappings of painting, others argued that there was a unique photographic aesthetic which ought to be explored and developed, establishing photography as an independent art. Others saw photography as the death of art itself.

Baudelaire, writing in 1859, was not alone in his belief that photography was, "the refuge of every would-be painter, every painter to ill-endowed or too lazy to complete his studies … [and that] … I do not believe, or at least I do not want to believe; but I am convinced that the ill-applied progress of photography, like all purely material advances, have contributed much to the impoverishment of the French artistic genius already so rare. Baudelaire's dismissive remarks may have contained a germ of truth, but amounted to an unsustainable generalisation. Many of the finest examples of the art of photography produced in France in the 1850s were created by photographers who had first trained as painters—Charles Nègre, le Gray, Henri le Secq, André Giroux, Charles Marville and Edouard Baldus amongst them.

The understanding of the photographic perspective, the importance of light and shadow—so ably demonstrated in the early 1840s by Talbot—or the potential for creative interpretation rather than simple representation, which would help define and develop the photographic aesthetic, would take many more years to permeate the growing photographic community.

John Hannavy

See also: Gros, Baron Jean-Baptiste Louis; Le Gray, Gustave; Talbot, William Henry Fox; Fenton, Roger; Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); Brady, Mathew B.; Whipple, John Adams; Werge, John; Archer, Frederick Scott; Diamond, Hugh Welch; Mudd, James; Laroche, Martin; Snelling, Henry Hunt; Cutting, James Ambrose; Blanquart-Evrard, Louis-Désiré; Du Camp, Maxime; Greene, John Beasly; Bisson, Louis-Auguste and Auguste-Rosalie; Sutton, Thomas; Foster, Peter le Neve; Fry, Peter Wickens; Gurney, Jeremiah; Southworth, Albert Sands, and Josiah Johnson Hawes; Bourne, John Cooke; Waxed Paper Negative Processes; Mestral, O.; Keith, Thomas; Prevost, Charles Henry Victor; Williams, Thomas Richard; Kilburn, Benjamin West and Edward; Claudet, Antoine-François-Jean; Sparling, Marcus; Kinnear, Charles George Hood; Szathmari, Carol Popp de; Langlois, Jean Charles; Martens,

Friedrich; Robertson, James; Nadar (Gaspard-Félix Tournachon); Howlett, Robert; Frith, Francis; Teynard, Félix; Vogel, Hermann Wilhelm; Nègre; Le Secq, Henri; Giroux, André; Marville, Charles; and Baldus, Édouard.

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HISTORY: 5. 1860s

As one might expect, a study of photography in the 1860s must make allowance for some overlap in seeking to frame the ten years or so during which changes occurred in the medium with respect to technology, culture, and society. From a curatorial and scholarly perspective, the decade has been viewed as part of an ascending arc, a "golden age" wherein photography's rising fortune no longer depended on the rivalry between photography on paper and the daguerreotype, but on Frederick Scott Archer's system of wet collodion on glass plates. The process in essence provided the best of both earlier techniques, retention of detail as well as tonal breadth, and therefore met the requirements of an age marked by the appreciation of traditional artistry and the economic, industrial, and scientific embrace of empiricism. The technical shifts, shaped as they were by both aesthetic and utilitarian considerations, are also indicative of public ambivalence at the time with respect to the photographic image as art and as truth.

While the importance of the medium for both documentary use and artistic expression had certainly been recognized in its first two decades, the late 1850s saw the emergence of more organized efforts to use the camera as an agent in the gathering of visual evidence on a global scale. The advancement of an educated modern American and European public included a desire for knowledge of a world still relatively unknown to the vast majority. In the fervor of aesthetic debate, the critical proponents of artistic imagination denied a place for photography as "Art" in contemporary culture, or only reluctantly accorded it a secondary position with respect to conventional pictorial means. Yet scarcely contested were its alleged superior powers of verisimilitude and potential for recording all manner of phenomena from microscopic forms to heavenly bodies. Unlike other implements of mapping, measuring, and visualizing the geography of a region for scientific, historical, commercial, and political reasons, the camera became an integral tool in creating an awareness of national identity as well as of one's self with respect to the rest of world. In hindsight, the general 19th-century view of the medium's neutrality has come under increasing critical dispute, for the production and reception of photographs led to meanings closely aligned with the ideological persuasions of the day. In documentary work, photographers were guided by a sense of social, cultural, and historical import of the subjects which they pursued; their achievement depended to a large degree on how well the results of their enterprise met the demands of both the public imagination and government agendas.

Art criticism of the late 1850s carried the debate into the new decade regarding photography's role in modern society. Could photographers legitimately engage in earnest attempts to create symbolic narratives or *tableau* that had previously been the preserve of traditional iconography in painting, drawing, and printmaking? Was not the medium's mechanical nature better suited to applications that simply required recording of subjects as a means of enlightenment, the production of new knowledge? In European and American circles of social privilege, wherein well-established codes of cultural refinement and taste were closely followed, many could not accept photographs as equal to art for conveying the depths of the human imagination, for translating the raw material of life and nature into the grand ideals and noble sentiments of tradition. Reservations abounded, despite the efforts of sophisticated practitioners with aspirations to create pictures with artistic appeal.

In England, the influential critic John Ruskin had considered photography useful for artistic studies, and had even tried his hand at it on several occasions. By the end of the 1860s, however, despite the element of veracity that was central to his support of Pre-Raphaelite and landscape aesthetics, Ruskin had judged photographs the product of a mechanical device, which art was most certainly not. His contemporary Lady Elizabeth Eastlake had written of her uncertainty, too, observing that photography could only ever imperfectly portray "Nature," meaning a nature considered in the academic sense, which required selectivity through "artistic feeling" to represent anything truthfully. Across the English Channel, French poet and critic Charles Baudelaire had expressed his sentiments with far greater disdain, as witnessed in his 1859 Salon review: "let it be the secretary and clerk of whoever needs an absolute factual exacti-

tude in his profession…But if be allowed to encroach upon the domain of the impalpable and the imaginary, upon anything whose value depends solely upon the addition of a man's soul, then it will be so much the worse for us!" (Goldberg, 1981, p. 125) Thus the camera was relegated to the status of recording instrument, a product of the industrial age.

Despite such criticisms, professionals and skilled amateurs alike produced evocative landscapes, portraits, and tableau of pronounced sentiment. Among British photographers, several have displayed qualities that have secured them a place in the "canon" (i.e., widely recognized as culturally and historically significant) including Julia Margaret Cameron, Lady Clementina Hawarden, Oscar Rejlander, and Lewis Carroll. These Victorians would not allow the medium's relationship to the material world and surface appearance to stand as obstacles in the way of expressive purpose. Cameron, for instance, is well known for her subtly mannered portraits of contemporary literary and theatrical personalities, and her staging of poetically effusive characterizations of children and adults. She used the vagaries and variables of exposure and focus to aesthetic advantage in order to soften features and heighten the expressive properties of light and dark. Rejlander, Cameron's friend, was perhaps the most extreme in his attempt to approximate Victorian painting of the genre and anecdotal variety. For dramatic ends in his final prints he frequently manipulated two or more negatives in combination, thereby partially liberating photography from its direct causal (or in semiotic terms, *indexical*) relationship to the subject before the lens at the time of exposure.

The portrait photograph, though evident as a key subject area in preceding decades, became a thoroughly entrenched commodity amid the growing urbanization of Europe and the United States and the spreading of western social institutions in the colonized world. Nadar's (née Gaspar-Félix Tournachon) bold pictorial record of celebrated personages of Paris in the late 1850s and 1860s best exemplifies how pose, careful lighting, and attention to technique could secure a place for luminaries belonging to the cultural vanguard of the city. Portrait photography vastly exceeded the painted portrait in popularity during the decade. Nadar's career had begun in 1853 with his investigations into photography while attempting to create a series of lithographs that collectively displayed notable visages of Parisian culture—his *Panthéon Nadar*—but abandoned the printmaking project for the camera. The cult of personality in today's media can perhaps be traced to this particular moment in the history of the portrait in photography, during which the faces of acclaimed or notorious individuals entered the public domain in ever increasing numbers. Political fortunes could be staked on such images. One of the best known instances involves Mathew Brady's small photograph of Abraham Lincoln taken before his election to the presidency in 1860. The image was reproduced in the press during the campaign, thus spreading Lincoln's clean-shaven, pre-Civil War likeness throughout the U.S. and beyond. By the late 1840s Brady had already established daguerreotype portrait studios in New York and Washington, D.C.; he had envisioned a "Gallery of Illustrious Americans" that would have implications for the acceleration of similar endeavors at least through the 1860s. Portrait operators like Nadar and Brady thus helped to shape a modern society dependent on the visibility of public figures through the media, as much for entertainment and personal fantasy as for an awareness of the influential political and cultural figures of the age.

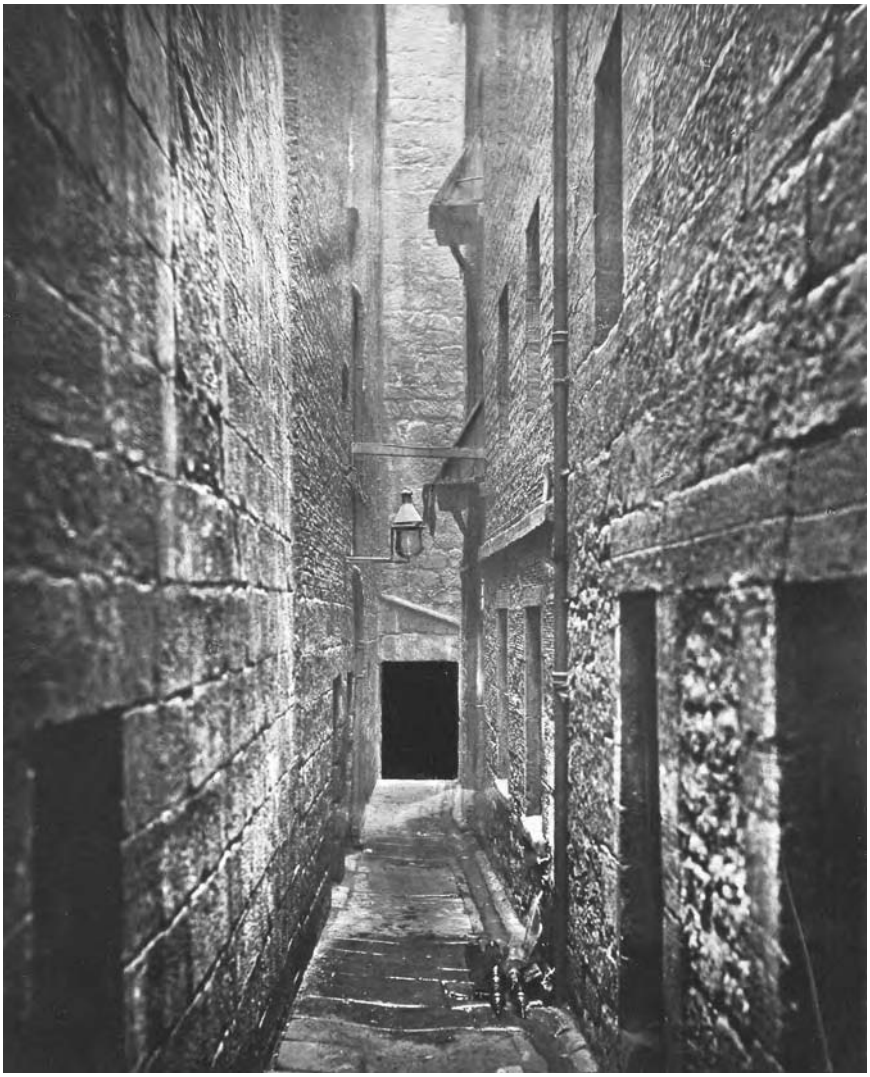
While Nadar, Étienne Carjat, and other talented practitioners in Paris of the 1860s set a high standard for artistic portraiture, photography also enabled the production of relatively cheap pictures of people from all stations of life. Adolphe-Eugène Disdéri, also operating in Paris, had patented in 1854 a commercial breakthrough in the form of multiple exposures of a sitter on a single plate. The process resulted in the *carte-de-visite* (Brady's *Lincoln* is an example), a small, easily exchanged photograph mounted on thin cardboard stock. *Carte-de-visites* reached their peak of distribution in the 1860s; in exchange for the expense and labor involved with an elevated artistic portraiture was an economy of production, and hence an increase in the mass reception of images unlike anything that had occurred prior to the period. The *carte-de-visite*, the cabinet card, a slightly larger format which appeared later in the decade and fulfilled a similar social function, and the tintype (which would replace the ambrotype in the '60s) would enable the public to afford the acquisition of images of one another, of individuals of distinction, of peoples and landscape views from geographical locations around the world. Add to this the growing numbers of stereographic views, extremely popular among the middle class at least through the remainder of the century, and one begins to realize how photographs became pervasive in the private lives of ordinary people. Though difficult to isolate as a function of our timeframe, the impact of images during the decade on the formation of a mass subjectivity or collective psychology must seriously be considered—matters related to all the emotional turbulence of an individual's life: love, trauma, death, faith, childhood, aging, memory, fear.

The growth in photography of individuals can been seen as part of a larger phenomenon that advanced considerably in the 1860s. This may be characterized as a zeal among advancing nations for making more tangibly visible people, places, and occurrences which had formerly been conveyed through paintings, drawings, and words. Photography's position as a credible

agent among these prior modes of testimony was all but established by the new decade. Pictures were not only accessible in both single image and stereograph formats, in albums, and in books, but as an accompaniment to printed scientific, scholarly, and popular material. Among the more poignant instances of this accessibility were images of war. While action views were produced on a restricted basis, mostly limited to stereo pictures because of the still relatively long exposure times for the larger photographs, the 1860s saw a proliferation of imagery related to the devastation of battle and the soldiering life. Following his experience in India at the scene of the Indian Sepoy rebellion in 1857 and 1858, Felice Beato next traveled to China to produce a photographic response to the Second Opium War of 1859 and 1860. Photographs of the U.S. Civil War were initially marketed by Mathew Brady, who had the original idea to hire a corps of operators to follow the Union forces. Alexander Gardner and Timothy O'Sullivan are the best known of Brady's men, both of whom broke with the senior portraitist to produce albums of the war, such as *Gardner's Photographic Sketchbook of the War* (1866), which included some of the earliest images of fatalities on both sides. Gardner's choice of the term "sketchbook" is perhaps an acknowledgement of the still tentative reception of photography for on-the-spot visual reportage, yet undoubtedly also served to remind viewers that photographs could now graphically communicate the weight of the experience as well as any hand drawn picture.

As marvels of revelatory experience for the 1860s observer, photographs worked in intriguing, often contradictory ways to serve scientific agendas on the one hand, and the world of popular culture and entertainment on the other. Nadar took his camera into the catacombs of Paris in 1861 for a rather startling look at the subterranean, and on more than one occasion between 1858 and 1868 had gone up in a balloon to secure the first aerial views of the city. G.-B. Duchenne de Boulogne had produced photographic studies of human expression in the mid 1850s. These were published in 1862 in a book demonstrating his experiments that included the electrical stimulation of the facial muscles: *Le Mécanisme de la physiognomie humaine, ou analyse electro-physiologique de l'expression passions applicable à la pratique des arts plastique*. Scientific inquiry thus went hand in hand with possible applications to the arts and generally revealed a fascination with strange, scarcely seen phenomena. In the most extreme of cases photography was recruited to bear witness to manifestations of the occult, spirit worlds beyond the living. The Spiritualist movement had its photographic proponents, like William H. Mumler of Boston, who also seized an opportunity for profit by picturing the "ghosts" of the deceased together with their living family or friends. His studio, opened in the early 1860s, served clients as well known as Mary Todd Lincoln, who posed with the spirit of her dead husband, the former president. Progress in science in the 19th century was predicated on empirical data—firsthand experience informed its reports and treatises, but the methods of science were often co-opted to give dubious or even insidious theories an authoritative cast. Thus the photograph's alleged objectivity served well to reinforce the positivist philosophy underlying the investigation of the world at this time, while giving credence to assumptions about life (and death) that have since been discredited.

Photography's utility in the authentication of encounter, theory, and speculation is further reflected in the increase of ethnographic projects in the 1860s. The camera assisted (and some would say *abetted*) systematic attempts to identity distinct groups within Western society, as well as within geographically far ranging peoples. In the eight volumes comprising *The People of India*, published between 1868 and 1875, the editors John Forbes Watson and John William Kaye capitalized on the medium in a colossal pictorial study with accompanying letterpress, effectively categorizing Indians by race, caste, and tribe. Far from neutral or objective, however, different groups are assigned specific traits, indicating for example those who might make trouble for civil authority, and so proving useful in the continued administration of India under the British Raj. Hence, through the orderly assemblage of images and text, pioneers of anthropology attempted to make scientific sense of the disarray of humanity, which resulted in a typecasting that reinforced an ideology of European imperialism even as such work bore witness to disappearing cultures. "Native groups" (as they were often known in the commercial trade), sometimes posed with the accoutrements of their respective occupations, became increasingly common through the commercial trade in photographs. Related views of vernacular dwellings and surroundings also figured into the an ever-expanding "knowledge" base that stimulated both scholarly study and popular dissemination. Commercial operators cultivated a popular fascination with the exotic in a manner that projected a notion of the "East" as different and perverse, but nonetheless oddly compelling to the European and white American imagination. Constructed versions of certain non-western locales and peoples have been critically assessed as a facet of Orientalism, which examines the subtle ideological currents underlying western cultural representations of a wide global sweep extending from north Africa to the Middle East, India, and the Asia of the Far East. The portrayal of native Americans, especially the Indians of the Plains and Western territories, forms a separate area for inquiry in relationship to photography of before, during, and following the 1860s. Yet, the image of the



Annan, Thomas. Close, No. 61 Saltmarket. One of 40 prints from an album entitled: "Photographs of Old Closes, Streets & c."
The J. Paul Getty Museum, Los Angeles

"Red man" had become subject to its own peculiar kind of *orientalism* particularly by the end of the century. Current conditions and rapid changes occurring in the lives of indigenous peoples, the results of cultural clashes with Anglo-Americans and Europeans, were relatively little depicted through the lens compared with natives perceived as specimens of peoples on the brink of extinction.

Legendary or imaginative associations of place no less than historical significance became major motives for taking numerous corresponding pictures of architectural monuments and their environs. Astute photographers came to understand that profits were to be made by tracking down a variety of culturally and politically important subjects. George Washington Wilson, a native of Scotland, developed an eye for the best view to be sure the growing tourist market for domestic scenery would be satisfied. His business, started in the early 1850s, realized continued success in the following decade with photographs and books of Scottish and English subjects of literary renown, including Fingal's Cave at Staffa (c.1863-67) and Scott's Tomb at Dryburgh Abbey (c. 1863–68). Francis Frith had launched his Reigate firm in 1860, having just returned from a third and final journey to Egypt and the Holy Land. His acclaim grew from several publications of his large format prints (e.g., *Cairo, Sinai, Jerusalem, and the Pyramids of Egypt*, 1860), exquisite in their delineation of ancient monuments, profound in their association with Biblical places. In 1862, Frith and Company was established, which became a huge commercial concern; Frith had decided to cast his net even further from England by hiring other operators to photograph on the Continent, while also buying inventories of photographs taken of India and elsewhere. To re-photograph the same subjects and to market them under different imprints was hardly unusual for the period, especially if they had a proven record of popularity. With the increased competition among photographers of the 1860s, the systematic cataloguing of each new series of pictures by place and subject, with corresponding negative numbers, became an important marketing strategy (Wilson and Brady had adopted just

such a practice with their work). Catalogues, in contrast to books and other closed systems of printed material with pre-selected pictorial accompaniment, allowed for individuals as well as collecting institutions to select the images and to compile them as they pleased. The open format of distribution thus lent itself to specific interests or areas of inquiry, for mementos of a lived experience through foreign residency or travel, for satisfying one's historical or scientific curiosity, for scholarly research, or perhaps a combination of these concerns.

The work of traveling photographers of the period were compelled by several, sometimes conflicting motives to get their views. They often went to extraordinarily lengths to do so, and the widespread use in the 1860s of wet collodion on glass for landscapes makes these adventures even more astounding in light of the physical encumbrance of equipment necessary for any serious traveling photographer. In the tradition of the Picturesque, landscapists often looked for features that matched their conception of the pleasant prospect; if the scenery fell short of such expectations, the inclusion of a rustic or exotic dwelling, a fore-grounded tree with background hills, or a figure or two situated in the view would suffice. One detects, however, a change in awareness that enlarged the conception of earlier artists concerning the pictorial interest of unusual or unconventional subjects. Photographs were, after all, unavoidably informed by the very shape of the terrain and the impact of its inhabitants. And the majority of professional photographers—in contrast to talented "amateurs" without pressure to sell their work—were scarcely at liberty to pursue their individual subjective vision and interests exclusively, but must frequently adhere to the mandates of the various circumstances underlying their presence in the field, from entrepreneurial to political and scientific.

Samuel Bourne's seven years in India, beginning with his arrival from England in 1863, provides an significant instance of a photographer who worked abroad in order to build a successful enterprise particularly based on landscape and architectural views, in this case with his partner Charles Shepherd. Bourne and Shepherd's vast archive of images of the subcontinent encompassed Bourne's extensive photography of the Himalayas and architectural monuments. His sensitivity to both current public and scientific interest undoubtedly served him well to achieve acclaim for his work in photographic societies in India and in Europe, and to find their way into multiple collections and texts of use to a variety of disciplines. Bourne's work shares with others of the period a personal attraction to the extremes of nature, particularly with his counterparts who ventured into the North American wilderness. Carleton Watkins and Eadweard Muybridge offer perhaps the closest parallels, insofar as they too had a taste for the spectacular in nature. Both Watkins and Muybridge made several trips into California's Yosemite Valley in the High Sierra wilderness in the 1860s, while seeking to market their views to the public. Each strongly displays a distinctive approach to framing the natural environment. They also align themselves with others of their contemporaries who, unlike Bourne, worked under government patronage at one time or another. Watkins had photographed for Josiah Whitney's California State Geological Survey in the mid-1860s and Muybridge had received government commissions between 1868 and 1871. Perhaps most controversial with respect to government survey photography was Timothy O'Sullivan, a rather enigmatic character who had worked for Brady and Gardner during the Civil War. O'Sullivan was hired in 1867 to join the first of several campaigns under the leadership of geologist Clarence King, the U.S. Geological Exploration of the Fortieth Parallel. The area of exploration mainly comprised the exceedingly vast, decidedly non- picturesque desert and mountain wilderness of the Great Basin region. Though difficult to gauge precisely, King's relationship with O'Sullivan was surely a mutually reinforcing one, with the scientist assisting to direct the photographer's vision, while conversely, the striking formations pictorially articulated by O'Sullivan necessarily impacting King's ideas concerning theories of geologic time.

O'Sullivan's work for the King survey also exemplifies a direct correlation between the wilderness view and political ideology that was consistent with U.S. expansionist policies, readily evident in the way King used the photographs as illustrations in his reports to identify economically promising areas. More subtly, photographs could be construed as symbolic appropriations of regions otherwise occupied by indigenous peoples, or instrumental in the surveillance of areas of political or economic interest to multiple conflicting powers. Even the archaeological documentation of India, which became extensive from the 1860s, and ostensibly neutral in its collective efforts to construct a viable history of architecture (see, e.g., the treatises of James Fergusson), can be demonstrated to have supported the British justification of political control of the subcontinent. Further, individual civilian efforts to document a land and its people might also be interpreted as reinforcing the paternalism of the imperialist project, as witnessed in John Thomson's narratives and photographs of his travels in China between 1867 and 1872 (see *Illustrations of China and Its people*, 4 volumes, 1873–74).

Thus the proliferation of photographs in the late 1850s and 1860s reflects a diversity of image types and channels of dissemination, which implicates how the subjects portrayed could be open to multiple interpretations based on the social and economic conditions sur-

rounding their reception and the particular perspective of the viewer. At a time when western nations continued to establish their power both politically and culturally, photography flourished as an agent in the production of new and remarkable bodies of visual information. It provided a more knowledgeable, educated, and prosperous citizenry with further grounds for the rigorous affirmation of progress and self-determination, both hallmarks of modernism.

GARY D. SAMPSON

See also: Archer, Frederick Scott; Wet Collodion Negative; Ruskin, John; Eastlake, Lady Elizabeth; Baudelaire, Charles; Cameron, Julia Margaret; Hawarden, Viscountess Clementina Elphinstone; Rejlander, Oscar Gustav; Dodgson, Charles Lutwidge; Nadar; Carjat, Etienne; Disdéri, André-Adolphe-Eugène; Cartes-de-Visite; Tintype (Ferrotype, Melainotype); Beato, Felice; Mumler. William H.; Ethnography; Orientalism; and Frith, Francis.

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HISTORY: 6. 1870s

Writing in *The Year-Book of Photography* for 1870, the editor, G. Wharton Simpson, began his review of the previous year by remarking "The history of photography has passed into the uneventful stage: the art has acquired a steady, healthful being, and great discoveries no longer disturb the even tenor of its existence." This was a reflection of a widely held view that photography was passing through a period of steady but unspectacular progress along well-trodden paths. With hindsight, we can see that Wharton Simpson and his peers were, in fact, entering a decade that was a pivotal period in the history of photography. The main agent of change was the introduction of reliable gelatine bromide emulsion dry-plates in Britain. By the end of the decade gelatine bromide plates were being mass produced and increasingly adopted by photographers of all classes. The consequences of this and other technological advances were to completely transform the practice and nature of photography.

The 1870s could perhaps be termed the British decade of photography. It was no quirk of fate that the key development of the 1870s took place in Great Britain, or that many of the distinguished photographers remembered today were British. Britain was the richest country in the world. Relatively untroubled by events abroad, political stability, empire, industry and trade had all helped to create a prosperous middle class with time and cash to spare. In contrast, Continental Europe began the decade preoccupied with the Franco-Prussian War, which was then followed by periods of violent political instability. French photography in particular was profoundly disrupted by the social changes arising from wider events. Across the Atlantic the United States was a growing industrial and trade rival but in the 1870s still tended to follow European trends and was still a frontier country struggling to come to terms with the trauma of its Civil War.

In 1870, professional photographers could be found plying their trade all over the world. Despite a world-wide trade depression, New York photographic studios remained as Werge had described them five years earlier. "Their number is legion, and their size is mammoth…and mammoth is the amount of business done in some of those "galleries." (Werge 1890, 199). In London, *Kelly's London Post Office Directory* for 1870 listed more than 250 addresses of "Photographic Artists," 28 photographic apparatus manufacturers, and 26 photographic materials dealers, which included printers, paper makers and dealers, publishers and album manufacturers. The photographic artists listed were mostly professional portrait photographers practising the wet collodion process in studios much the same as those of 20 years earlier. Studios would be equipped with traditionally made mahogany sliding box or square bellows cameras fitted with brass lenses and mounted on stands or tripods. Other studio equipment would commonly include the headrest and painted backcloths with appropriate furniture. During the 1870s, gardens or rural scenes, complemented with items such as rustic chairs and stiles were fashionable.

The standard portrait form of the period remained the *carte-de-visite* but the larger cabinet portraits introduced

in the mid 1860s were becoming increasingly popular. According to one contemporary they allowed "greater scope for the display of an artist's skill, and a more commanding picture produced." (Cox 1876, p.40). Attempts were made to popularise larger formats. Valentine Blanchard in England introduced the boudoir portrait, which was described as having similar relative proportions to the carte-de-visite but larger. It was designed to show the full-length figure. An American introduction, of a similar size but with slightly different proportions, was styled the promenade portrait. Only the wealthiest clients would ask for portraits in whole-plate or 10 × 8 inches. The increasing popularity of larger portraits helped promote a renewed interest in enlarging. Enlarging was generally seen as a tedious business involving cumbersome solar enlargers and long exposures. Most earlier photographers seeking a large image had preferred to use a large camera. However, in 1873 John Trail Taylor reported "it is significant that several London photographers of reputation have already disposed of their large lenses as instruments for which they have no further need" *(British Journal Photographic Almanac 1873*, 19). By using a long extending focus camera to produce an enlarged intermediate transparent positive, which could then be further enlarged using the same procedure, it had been found that good images of up to 12 × 10 inches were possible. Such techniques required skill, exposures remained long and most photographers were still reliant on natural light. Enlargements could be made by artificial light using oxy-hydrogen limelight and appropriate equipment was marketed but there is little evidence it was widely used. Although continuing to make extensive use of the solar enlarger, American studios had a reputation for producing exceptionally fine enlargements. Interest in stereoscopic photography continued to decline in Europe but remained popular in America. Negative retouching became widespread in European and American studios of the 1870s although there were many critics of the practice and it became one of the major controversies of the decade. Wharton Simpson in Britain perhaps summed up the trade attitude when he claimed "The introduction of the practice of working on the negative has given to negatives of inferior quality a factitious appearance of better work; the smoothness, and apparent delicacy and finish, recalling in some qualities the characteristics of really artistic portraiture. This dead level of qualities which please the public taste is a doubtful benefit to the art, but it has undoubtedly done something to stimulate the trade in photographic portraiture."(*The Year-Book of Photography 1876*, 18–19). Experiments to make portraits by the light of burning magnesium powder were abandoned in the 1860s. The first portrait studios to successfully use artificial light were the electric light studios in Paris of Van der Weyde in 1878 and Liebert in 1879 but they were not typical of the period. Tintype portraits continued to be popular in America but were generally held in low regard in Europe.

The better studio photographers of the 70s made subtle use of posing, lighting and backgrounds to achieve the desired artistic impression. The most famous professional studio portraitist of the day was probably the French "Titian of Photography," Nadar (Gaspard Felix Tournachon), although following the siege of Paris and the subsequent social unrest, much of the work coming from his studio was by his assistants and his son, Paul. Also active until the middle of the decade was another notable French photographer, Etienne Carjat. Like Nadar, Carjat's reputation was based largely on his portraits of contemporary celebrities. The work of both appeared in *Galerie Contemporaine*, a series of portraits and accompanying biographical text, of distinguished French artistic and political figures that was published weekly between 1876 and 1880. There was a view that the overall quality of British portrait photography was inferior to that of their French contemporaries although the French artist and photographer, Antoine Adam-Salomon, wrote in 1871 of 'the marked progress made in artistic portraiture by English photographers' (*Year-Book of Photography 1871*, 23). In America, William Kurtz's "Rembrandt" portraits, Napoleon Sarony's, unconventional posing and J.M. Mora's use of exotic backgrounds, earned them nation-wide recognition.

While it was commonplace for the most humble studios to advertise their portraits as artistic, there were some photographers continuing to suggest that photography should have more lofty ambitions and the question of whether photography was capable of a position amongst the fine arts remained a hotly argued debating point. Three of the most distinguished 'high art' photographers of the period were active in England during the 1870s but Julia Margaret Cameron, Oscar Gustave Rejlander and Henry Peach Robinson had made their reputations, and arguably produced their best works, in the previous decade. Cameron is celebrated today primarily for the large close-up portraits of famous men such as Darwin, Herschel and Tennyson, all taken in the 1860s. Tennyson later suggested she should create images for his *Idylls of the King* and these were published in 1874 and 1875. Even the best of Cameron's genre studies are mawkish to modern eyes and the Tennyson pictures are not her best work. Cameron and her husband soon left England for Ceylon. She continued to practice photography but produced no further major work and died in 1879. The painter-photographer, Oscar Rejlander was also close to the end of his career. His moral allegory printed from thirty separate negatives, *The Two Ways of Life,* had provoked a minor sensation in the late 1850s. Other moralistic studies followed and for a time he was an influential figure. By the 1870s

however, he was working in less controversial areas as a London portrait photographer and supplementing his income by supplying photographic studies of children and adults to artists. His last major work consisted of illustrations for Charles Darwin's book, *On the expressions of the Emotions in Man and Animals*, published in 1872. Henry Peach Robinson was perhaps the most influential art photographer of the day and was to have a longer career. Robinson was a competent painter who had turned to portrait photography in the 1850s. Following Rejlander's path, his 1858 combination print, *Fading Awa*y, had been widely admired, both in Britain and abroad. Other genre combination prints, often in a Victorian sentimental style, soon followed. His most admired print of the 1870s was probably *When the Day's Work is Done* (1877). Robinson was a prolific author and despite periods of ill health, contributed numerous articles to journals throughout his career. His first book published in1869, *Pictorial Effect in Photography,* was based on the principles of the art education programme of the Royal Academy and became a seminal text for the rest of the century. Despite his influence and the esteem in which he was held, Robinson had his critics who accused his combination printing technique of misrepresenting the truth. Robinson was a complex figure. As a photographer, he specialised in producing representations of nature that never existed in reality. Yet when contributing to one of the burning debates of the period, he wrote in the *Photographic News* (Jan. 26, 1872, 41). "The chief charge against retouching is, that it destroys the truth of nature as represented in photography." Joseph Gale's images are less well known today but he was an admired and respected English photographer who first came to notice in 1874. His gentle rural landscapes and views with carefully posed models were perfectly in tune with English fashion of the period.

Away from the studios, landscape and architectural photography remained widely practised activities by specialists. Francis Bedford had taken up photography in the 1850s and photographed in the Holy Land in the 1860s. During the 1860s and 1870s he travelled widely in Britain taking wet plate-views on his large format cameras. Thousands of his views were sold in single print and stereoscopic form. He also found time to contribute regularly to the photographic journals. Similarly, the commercial concerns of the photographers James Valentine and George Washington Wilson were firmly established. Based in Scotland, enormous numbers of their views were marketed throughout Britain and abroad. Henry Taunt's wet-plate views of Oxford and the Thames taken in the late 1860s and early 1870s were greatly admired. Taunt included many to illustrate his book published in 1872, *A New Map of the River Thames.* The Scottish photographer, John Thomson, published much of his work in photographically illustrated books, which were eagerly purchased by the educated middle class in England. His views of China taken between 1870 and 1872 were published in 1873–4. The prints appeared in the form of carbon prints and collotypes with a written text by Thomson. Perhaps Thompson's most influential work was *Street Life in London*, prepared in association with Adolphe Smith and published in twelve monthly parts in 1877–78. The 36 Woodburytype images of the working class in London were derived from carefully posed negatives but are a landmark in social documentary photography. French architectural photographers also produced striking social documents. Charles Marville's views of the rebuilding of Paris between 1865 and 1878 are amongst the finest examples of architectural photography using the wet plate process. Also notable was the partnership of Delmaet and Durandelle that recorded the building works of the Paris Opera and the Church of Sacre-Cour during the 1870s. Many photographs of the devastation caused by the Franco-Prussian War were taken during the conflict but few have achieved the iconic status of Fenton's Crimean War views or the images of the American Civil War. The photographs taken during the subsequent insurrection in Paris have received more exposure although many of the photographers are unknown. Among those identified are Alphonse Liebert who published one hundred views of the destruction of Paris and events of the Commune in 1871 and the French commercial photographer Hippolyte Collard who photographed views of the street barricades. Documentary photography of a completely different order took place in America. The four US Geological and Geographical surveys of the Western Territories of 1867-1879 were conceived purely as scientific and documentary exercises but the powerful images of the rugged landscapes that were produced profoundly influenced the American public. The Photographers included Eadweard Muybridge, William Henry Jackson, Timothy O'Sullivan and Carlton E. Watkins. Although some rough prints were made in the field, regular shipments of wet-plate negatives were sent to Washington for printing. By the mid 1870s clever marketing had allowed an eager public to purchase enormous numbers of views sold in the form of prints and stereographs, images that have shaped the view of the American West to the present day. Jackson later had a long career marketing views of the west but his photographs of the 1870s, taken in association with a landscape artist, Thomas Moran, can be ranked alongside the most powerful images of American photography. The work of the survey photographers inspired the beginning of a professional 'landscape school' of American photographers.

The applications of photography to unrelated fields of observation, record and investigation continued to

widen during the 1870s. The first photographic analysis of movement by Eadweard Muybridge in America was an impressive achievement. In 1872 the former governor of California, Leyland Stanford commissioned Muybridge, to photograph a trotting horse, in order to determine whether at any point all hooves left the ground. Muybridge's early attempts in 1872 and 1873 were only partially successful. His chaotic personal life prevented immediate further work but he returned to the investigation in 1877. Armed with a faster shutter, Muybridge produced pictures sufficiently improved for Stanford to finance the conclusive project. In 1878 Muybridge adopted a method first proposed by Rejlander. Using a battery of cameras, he produced sequential photographs showing that a galloping horse did indeed briefly lift all four legs off the ground. That he was still using wet plate photography makes his success even more impressive. By the 1870s police forces were making increasing use of photography as an aid to identifying criminals and systematic picture archives were beginning to be assembled in the major European cities. The classification of thousands of images was a particular problem. In the late 1870s Alphonse Bertillon in Paris began devising a practicable system involving the measurements of specific anatomical details and strict standardisation of identification portraits, which were to bear no relation to commercial portraiture. Scientific studies by Cesare Lombroso in Italy and Francis Galton in England were undertaken to discover whether criminality could be determined from facial features. Galton's 1870s investigations led him to devise composite portraiture, successive brief exposures of several different portraits on a single plate. His work on criminal physiognomy was never accepted but he went on to use composite photography to confirm Muybridge's studies. During the Franco-Prussian War of 1870–1871, the use of microphotographs transported by 'Pigeon Post' created widespread interest. The chief architect of the scheme was the French photographer, Prudent Dagron, who used his experience gained making microphotographs for jewellery and trinkets to prepare microphotographs of written messages that were transported by pigeons to and from Paris during its siege. Photographic techniques were a key component of the many expeditions organised to observe the 1874 Transit of Venus and there was much speculation in contemporary photographic journals. Photographers and scientists had high hopes but most were disappointed with the quality of their final images. The wet collodion plates the majority of observers favoured were unable able to produce the sharp images required. The notable exception was the good results achieved by the French astronomer, Pierre-Jules-Cesar Janssen, who built an 'astronomical revolver' camera using circular daguerreotype plates. The insensitivity of the obsolete process was no handicap when photographing the sun.

One of the most significant technological developments in photographic history was brought about unwittingly by British amateur photographers. The gentleman amateur had been an important and influential figure in British photography since the days of the pioneers and by the early 1870s there were more amateur photographers in Britain than in any other country. The standard way of making photographic negatives remained the wet collodion process, reliable and practicable in a studio but the chemical manipulations involved, along with the necessary equipment and materials, made it far less suited to work in the field. As a consequence, many amateur photographers favoured dry processes, which allowed them to roam far and wide burdened by little more than a supply of pre-prepared plates and a camera. Unfortunately, early dry plates were unreliable and exposure times almost always longer than that for wet collodion, which was a continual source of frustration. New and supposedly better dry plates were a regular feature in the photographic press. Much space was taken up with discussions of their relative merits with firm conclusions rarely reached. A popular instruction book of the period describes no less than six different dry plate processes (Hughes, 1870, 66–74). Richard Leach Maddox's seminal *British Journal of Photography* paper of 1871 suggested that gelatine silver bromide emulsions might produce a dry plate that could match the qualities of wet collodion but it made little immediate impact. However, In 1873 a London photographer, John Burgess, marketed a bottled emulsion of gelatine bromide and later sold pre-prepared plates. The same year Richard Kennett patented a dried gelatine bromide emulsion, which was also marketed. Although many amateurs welcomed both products they enjoyed only limited commercial success. Reservations about the early products of Burgess and Kennett were partly due to their inconsistent quality but a major problem was the extraordinary sensitivity of gelatine bromide plates. Photographers of the period were totally unprepared for the short exposures possible with the new emulsions and regularly over-exposed their plates. But as amateur photographers slowly became more familiar with the characteristics of gelatine bromide, the advantages of short exposures became apparent, while refinements in the process and in manufacturing led to plates of improved and consistent quality. The Liverpool Dry Plate Company began selling Kennett's plates in 1876 and Charles Bennett's improved plates in 1878. Demand increased and other companies eager to exploit the enormous amateur market rapidly entered the business. By the end of the decade there were over twenty companies manufacturing and selling gelatine dry plates and many exhibitions now included amateur

photographs from gelatine negatives. A picture by Joseph Gale that captured a swallow in flight caused a sensation when it was exhibited in 1879. Professional photographers were much slower to take advantage of gelatine emulsions. John Werge later wrote of his "vivid recollection of the scepticism and conservatism exhibited by the most eminent photographers on the introduction of gelatino-bromide dry plates" (Werge, 1890, 96). Only towards the end of the decade did British professionals begin to use gelatine plates in any numbers and scepticism continued into the 1880s. The same was true of the professionals of continental Europe and America. Yet within a decade gelatine plate manufacture was to transform photography from a craft skill to a giant industry.

The fading of mass produced silver prints was a problem that had troubled photographers since the 1840s. By the 1870s several of the causes of fading had been identified but the problem persisted. John Trail Taylor claimed that "The balance of evidence is, we believe, in favour of the greater permanence of photographs printed on other than a surface prepared with albumen." (*British Journal Photographic Almanac, 1870*, 19). Printing in permanent pigments offered a solution. Carbon printing featured regularly in photographic journals, manuals and catalogues throughout the 1870s. Joseph Swan's carbon tissue process, introduced in the 1860s, had began to be adopted and Trail Taylor went on to advocate an improved version by J.R. Johnson, a director of the Autotype Fine Art Company. The Autotype Co. supplied carbon printing materials and made carbon prints for the trade as well as selling prints directly to the public. Carbon printing became widely favoured throughout Europe for reproducing art subjects. Notable European practitioners included Braun in Alsace, Hanfstangl in Munich and Goupil in Paris. The process did not have the same impact in America. William Willis's platinotype process, patented in 1873, was another non-silver process capable of producing permanent prints. It made little immediate impression but Willis improved the process and established a company to market platinotype papers in 1879. The platinotype process later became a particular favourite of artistic photographers wanting permanent exhibition prints. Carbon tissue formed the base component of the gelatine relief used in the Woodburytype process, a photomechanical process devised in the 1860s. Woodburytype prints were frequently used to illustrate printed books in the 1870s. Another photomechanical process that came to prominence was the collotype. This photolithographic process was devised by Poitven in 1855 but only came too wider attention when an improved form was commercially introduced by the German photographer, Josef Albert the late 1860s. Albertype, as it was known at the time, was described in detail in 1870s journals and was widely praised. An example published in the *Photographic News* (June 24, 1870) showed the interior of Albert's Printing Establishment in Munich. A subsidiary of the Autotype Company worked the process in the early 1870s as collotype, and they later sold collotype prints, often failing to distinguish between them and carbon prints. By the end of the decade there were 22 collotype printers trading in London. Yet more important in the longer term was to be the work of Karel Klic who invented modern photogravure in 1879 but the process was not widely worked until the 1880s.

By the end of the 70s some photographers were beginning to glimpse a different future for their art. Dated "Christmas, 1879," just a few weeks before his sudden death, Wharton Simpson wrote the preface to the first issue of *Photographic News* of 1880. It began, " The volume of the Photographic News just completed is, like those which have preceded it, a chronicle of twelve months' research, experiment, and result—a chronicle, in fact, of a year's work in photography throughout the world. But, unlike all others, it is chiefly devoted to the history of a revolution. The twelve months have witnessed a greater change in the practice of the art than has been seen by any former period." Wharton Simpson was referring to the increasing acceptance of gelatine bromide emulsions but other technical developments were also to have profound consequences. The 1870s were the last years when working photographers were required to master some of the theoretical and manipulative skills of the scientist in the manner of the pioneers. Two of the most distinguished pioneer scientists had left the stage—Sir John Herschel died in 1871, William Henry Fox Talbot in 1877. New scientists were coming to the fore. The work of Sir William Abney in Britain, and Josef Maria Eder and Hermann W. Vogel in Germany was to facilitate the development of greatly improved gelatine emulsions. In 1876 the French scientist, Ducos du Hauron, took out an English patent that established the basis of subtractive colour photography. Alongside the new photomechanical processes that were to revolutionise the printing industry and Muybridge's motion studies, the precursor of moving pictures, a new future was emerging. The tipping point had been reached; the foundations of modern photography can be discerned.

JOHN WARD

See Also : Dry Plate Negatives: Gelatine; Dry Plate Negatives: Non-Gelatine, Including Dry Collodion; Camera Design: 3 (1860–1870); Camera Design: 4 late (1850–1900) Studio cameras; Carbon Print; Photolithography; Art Photography; Cameron, Julia Margaret; Jackson, William Henry; Muybridge, Eadweard James; Marville, Charles; Nadar; and Robinson, Henry Peach.

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HISTORY 7: 1880s

The invention of photography was a significant moment in the history of art, in fact it meant the acceptance and assimilation of a new art form. It was characteristic of this development 50 years later that its practioners invariably opted for those motifs, themes and genres, which had traditionally been those of painting and graphic arts. There are also countless parallels and similarities in the schooling, background and studio methods of painters and photographers. The domination of the prevailing convention was extremely strong, forming a kind of leitmotif, which runs through the history of photography. Portraits, landscapes, genre scenes and literary themes were the favored subject matter.

In 1878 an Englishman called Charles Harper Bennett put the finishing touches to a method using gelatine-silver bromide which reduced exposure time to one twenty-fifth of a second. Soon after, plates which had been industrially adapted became available to the wider public.

Between 1880 and 1890, the very first portable cameras, which folding darkrooms attached, appeared on the market. These were used by painters such as Edgar Degas, as we know from the writing of his friend Daniel Loppé, a specialist in alpine landscapes who was also an amateur photographer.

Newspaper illustrations made their appearance in the 1830s. Among the first in an American newpaper was a woodcut view of the ruins of the great New York fire of December 16–17, 1835. But after 1850, newspapers virtually ceased using illustrations, and the public obtained its visual accounts of people, places, and events through the pages of such illustrated weeklies as Harper's and Leslie's. In 1873, the *New York Daily Graphic* made its appearance, using lithography for the printing of both type and illustrations (photolithographs). Stephen H. Horgan was hired as a photographer, but soon took over management of the paper's photomechanical printing operations. As he said later, the appearance of this newspaper was going to usurp the place of wood engraving. He did it for the first time on March 4, 1880.

Concurrently, with the progress of the presidential campaign of 1880, in which James A. Garfield won election by a narrow margin, photographers across the land began switching tot dry-plate practice. Albert Levy's gelatine dry plates and E. & H. T. Anthony & Co.'s Defiance plates were taken off the market by January 1881. But others were appearing on the scene. In St. Louis, Gustave Cramer teamed up with Herman Norden to perfect a commercial plate that would be better than anything previously offered. Their activity was another of the proverbial "burning the midnight oil' variety.

Eastman's dry plates were placed on the market by the Anthonys in December 1880. In Europe, meanwhile, photoengraving modes using a screening process, such as Baron von Egloffstein had used in 1865, were adopted by Joseph Swan in 1879, and by George Meisenbach, a Munich engraver, in 1882. First single-line screens which were rotated or turned during exposure with a negative to achieve a cross-line effect in the image secured on the sensitized printing surface, later a cross-line screen which consisted of two single-line screens cemented together face-tot-face at right angles.

Electric light on the market in 1882 brought a new brightness and bustle to cities at nighttime, and this tended to focus increasing public interest on theatrical personalities, adding further to an already popular craze of collecting cabinet card and carte de visite portraits of celebrities in all fields.

In 1883 William Schmid of Brooklyn, NY, was awarded an American patent for the first commercial version of the hand-held 'Detective' style box camera. It weighed 3.3 pounds and provided a rectangular viewing window which enabled the user to see the photograph he or she was about to take. The rear of the camera accepted one double plate holder, which could be used twice to make a 3¼ × 4¼ exposures on two separate negative

plates. The Schmid portable view camera was to have practically revolutionized the taking of instantaneous photographs.

By 1884, vast numbers of new recruits had joined the ranks of amateur photographers, attracted by the simplicity of the new hand-held or easily transportable cameras using dry plates. 1884 also marks the start of the career of the famous American photographer, Alfred Stieglitz. Initially, Stieglitz's father took his son to Europe when Alfred was seventeen and entered him in the Berlin Polytechnic Institute, believing that the future belonged to engineers. But Stieglitz became attracted to photography after seeing an inexpensive camera outfit in a Berlin shop window, and when he learned from a co-student that Dr. Herrmann Wilhelm Vogel was lecturing on aesthetic theory as applied to photography in another course at the Institute, he enrolled immediately in Vogel's class. One day in 1884, Dr. Vogel asked to show some of Stieglitz's photographs to a group of distinguished painters. While Europe's awakening to the potential of artistic expression in photography was still several years away, it appears that this twenty-year-old American in Berlin was among the first to awaken this interest among some of German's leading artists. Of the group who were shown Stieglitz's prints, several expressed the desire to have copies: one, according to Stieglitz, remarked: 'Isn't it too bad your photographs are not paintings. If they had been made by hand, they would be art.'

Stieglitz at first worked the wet-plate, but soon acquired dry-plate equipment. Speed in the taking, developing and printing of his photographs became a mania with him, and when he was asked why this was so, he responded that newspapers would in future be reproducing photographs more frequently, and that speed would become of increasing importance in this type of activity. If Alfred Stieglitz's thoughts were running to the mechanization of photography, one of Japan's earliest photographers—a man only four years older than Stieglitz—was at this time also considering the possibility of large-scale book illustration with photography. This was K. Ogawa, the son of a deposed landowner of the Japanese feudal system. A love of photography had become a consuming passion with Ogawa to the same extent it had with Stieglitz. Ogawa learned the rudiments of the wet-plate collodion process and even took up the manufacture of collodion. Just about the time that Stieglitz signed up for Dr. Vogel's course in Berlin, Ogawa got himself hired as a sailor aboard the American Asiatic frigate Swatara, and set sail to seek his fortune in the United States. He disembarked in Washington D.C. in January 1883 and remained until June 1884. He studied portraiture, carbon printing, collotype printing and dry-plate making.

The parallel between Stieglitz's and Ogawa's careers did not end with their respective beginners in foreign lands. Ogawa returned to Japan where, for a time, he operated a large studio in Tokyo. Soon he was photographing the heir apparent to the Japanese throne—a vastly greater honor in Japan than for a similar feat performed in a any capital of the western world. He founded the Shashin Shimpo, Japan's only photographic periodical, and established a photomechanical printing factory in Tokyo. Alfred Stieglitz, meanwhile, remained in Europe until 1890, after which he returned to the United States to become the protagonist of the American fine-arts photography movement, and founder of two of the country's most influential turn-of-the-century journals, *Camera Notes* and *Camera Work*.

Amateur photographers were in 1885 counted by the thousands and in the different cities were organized into flourishing and growing societies. In 1885 the Society of Amateur Photographers of New York held their first annual exhibition.

In 1881, Eadweard Muybridge visited the French physiologist Etienne Marey, but the photographs he brought with him of birds in flight were unsatisfactory for the scientific studies, which the Frenchman was then conducting along similar lines. After Muybridge returned to the United States, he began in 1885 a new series of photographic experiments at the Philadelphia Zoo.

Technical elements also developed progressively in the 1880s. The outset of photography's second half century coincided with the introduction of the Kodak camera and nitrocellulose film—both hallmarks of a new era for the medium. The new negative film process was an American development, resulting from independent research and development activities in Philadelphia, Newark, New Jersey and Rochester. The Kodak camera was actually patented in September 4, 1888 and was on the market at the outset of 1889. It was a small and lightweight and was strictly a film camera. Although it was still not possible to make color photographs in the modern senses, photographers by this time had at their disposal an assortment of special plates and color screens, the use of which would enable them to render better color values in their black and white prints. During the 1880s numerous other dyes were introduced for orthochromatic plates as erythrosine and xanthophylls.

In 1880 the American industrialist George Eastman, at the of age 24, set up Eastman Dry Plate Company in Rochester, New York and created the first half-tone photograph which was published in a daily newspaper, the New York Graphic. In 1886, George Eastman perfected a negative film, which had a photographically sensitized layer on it. It could be rolled up into a camera which one could be rolled up into a camera which could actually hold in one's hand, and then the film could be printed by professionals. Eastman called it a Kodak: "All you

have to do is press a button, and we'll take care of the rest," was the advertising slogan which helped insure the camera's worldwide success. It was patented in 1889. The Kodak was so handy that the most daring kind of pictures could be taken, completely breaking away from traditional perspectives, while its much smaller viewfinder produced images that were systematically cut off by the frame, and thus no longer composed. On the whole, with al few exceptions, it was mainly painters, who first realized how useful these little boxes could be, and what the visual possibilities were. They were a minority: most Kodak users at the time just aimed their cameras face on at the subject and clicked. In the spring or summer of 1886, George Eastman selected Paul Nadar, son of the just-retired Parisian photographer, as his agent in France for the new Eastman roll film system. By happenstance, the editors of Le Journal Illustré at about the same time asked Nadar to make photographs of the famous chemist Michel Chevreul in celebration of the latter's one hundredth birthday on August 31. The result was that the younger Nadar used a camera fitted with Eastman roll film to record the world's first photographic interview for a news publication.

In 1888 the first Kodak camera was created, containing a 20-foot roll of paper, enough for 100 2.5-inch diameters circular pictures. In 1889 an improved Kodak camera was made with roll of film instead of paper. Until the time of Eastman, photography, though already popular, was still considered too complicated for ordinary users, and George Eastman is remembered for having made photography accessible to all.

Eastman started off as a bank clerk, and then became interested in photography. He is particularly remembered for introducing flexible film in 1884.

Four years later he introduced the box camera incorporating roll film, and with his slogan "You press the button, we do the rest" he brought photography to the masses.

The box camera had a simple lens focusing on 8 feet and beyond. One roll of film could take a hundred images, all circular in shape. The entire camera was posted to the factory where the film was processed and the camera re-loaded and returned to the user, the charge for this being a few dollars. The photographs had a diameter of about 65mm, and opened up a new world for popular photography.

Eastman's contribution not only made photography available to all, but also resulted in a gradual change in what constituted acceptable photography.

Popular in the Victorian times was stereoscopic photography, which reproduced images in three dimensions. It is a process which popularity waxed and waned—as it does now—reaching its heights in the mid-Victorian era.

During the 1880s the press played a leading role in the social movement, which brought the harsh realities of poverty to the public's attention. The camera became an important instrument of reform through the photo documentary, which tells the story of people's lives in a pictorial essay. It responded to the same conditions that had stirred Courbet and its factual reportage likewise fell within the Realist tradition. Before then, photographers had been content to present the same romanticized image of the poor found in genre paintings of the day. In 1870, when he was twenty-one, Jacob Riis emigrated from Denmark to New York and spent the next seven of those American depression years going from job tot job often hungry, and once walking all the way to Philadelphia to seek a job from a Danish family he knew. The invention of gunpowder flash allowed Jacob Riis to rely for the most part on the element of surprise. Riis became a police reporter in New York City, where he learned first-hand about the crime-infested slums and their appalling living conditions. He kept up a steady campaign of illustrated newspaper exposés, books, and lectures which in some cases led to mayor revisions of the city's housing codes and labor laws. His photographs' unflinching realism has lost none of its force.

In 1887 he became informed on the advantages of taking photographs by flashlight. In practicing and doing so, he became America's first celebrated photojournalist and its first social documentation photographer. He soon produced a visual record, which clearly achieved the impression he had long sought to make on the New York community at large. With the publishing of his book, How the Other Half Lives, in 1890, he singlehandedly altered American society's perception of the term Social Justice.

In the 1880s the Pictorialist movement grew in Great Britain and the United States, where photographers concentrated on the artistic dimension of the medium.

England was the birthplace of Pictorialism, a movement created by experienced amateurs at the turn of the twentieth century. They felt that photography deserved to be given the same recognition as great art, as original prints has been. Two Englishmen founded the movement: Henry Peach Robinson and Peter Henry Emerson. The former published Pictorial Effect on Photography (1869), from which the movement derived its name. This hugely successful work was translated into French in 1885 under the title The Artistic Effect on Photography: Advice for Photographers on the Composition of Art and the Use of Light and Shade. As an artist, Peach Robinson made photomontages by bringing together negatives into a single print, a technique that never became popular with the Pictorialists.

The photographer and polemist Peter Henry Emerson a distant cousin of the American philosopher Ralph

Waldo Emerson built up a body of work so intense and remarkable that he is considered to be the father of a revival in artistic photography. The son of a rich Cuban planter, he came to England to study medicine, a field in which he excelled. However, after purchasing a camera in 1880, he decided to devote his life to photography. His professional career only spanned fifteen years, for after 1895 he stopped working but continued to encourage artists such as Alfred Stieglitz and, later on, Gyula Halàsz Brassaï. Emerson upheld that photography should be essentially naturalistic. He expounded this theory scientifically in an essay entitled Naturalistic Photography for Students of the Art (1889), in which he argued that photography was superior to painting as a means of expression through plasticity, and as a means for transporting the naturalistic vision. In 1890, after a period of crisis, he renounced these theories.

Emerson had always conceived his photographs for publication, with the text playing a subordinate but complementary role to the pictures. Like Jean-François Millet, whom he greatly admired, he was interested in the daily life of pleasants. He portrayed their movements and daily rituals, imbuing them with a feeling of the monumental and of timeless gravity. Over a period of then years, Emerson produced no less than twelve albums of photographs of the lives of peasants in East Anglia.

The photographic images in the 1880s of Hameter, Muybridge, Jackson, Watkins, Vroman, Thomson, Von Stillfried all have a pictorial and consciously, artistic accent.

An entirely new direction was charted by Eadweard Muybridge (1830–1904), the father of motion photography. He mixed two different technologies, devising a set of cameras capable of photographing action at successive points. After some trial efforts, Muybridge managed in 1877 to get a set of pictures of a trotting horse, which forever changed artistic depictions of the horse in motion. The photographs of Muybridge convey a peculiarly modern sense of dynamics reflecting the new tempo of life in the industrial age. However, because the gap between scientific fact and visual perception on the other was so big, the Futurists would realize their far-reaching aesthetic implications only later.

Edward James Muggeridge was born in Kingston on Thames, and it is said that because this area is associated with the coronation of Saxon kings, he took on a name closely resembling (as he saw it) the Anglo Saxon equivalent. In his early twenties he moved to America, and became famous for his landscape photographs of the American West. As he used the collodion process, like other traveling photographers, he needed to take with him all the sensitizing and processing equipment, as all three processes of sensitization, exposure and processing needed to be done while the plate was still wet.

During the late sixties and early seventies he made some two thousand pictures, exposing negatives of a size of 20 × 24 inch. Though he is not given the acclaim he deserves, many his landscape studies rank with the best.

However, Muybridge's main claim to fame was his exhaustive study of movement. Just at same time the French physiologist Etienne Marey was studying animal movement, and his studies began to suggest that a horse's movements were very different from what one had imagined. One of the people who became aware of this research was Leland Stanford, a former governor of California, who owned a number of racehorses. Stanford was determined to find the truth about this. It is said that he bet with a friend that when a horse gallops, at a particular point all four feet are off the ground simultaneously. To prove his case he hired Muybridge to investigate whether the claim was true.

Muybridge's studies are very comprehensive, and include some detailed studies of men and women walking, running, jumping, and so on.

In 1878 an article in *Scientific American* published some of Muybridge's sequences, and suggested that readers might like to cut the pictures out and place them in a "zoetrope" so that the illusion of movement might be re-created. Intrigued by this, Muybridge experimented further, and later he invented the zoopraxiscope, an instrument that paved the way for cine photography. This invention was greeted with enormous enthusiasm both in America, whilst in England a demonstration at the Royal Institution in 1882 attracted people like the Prince of Wales, the Prime Minister (Gladstone), Tennyson, amongst others.

In 1884 the University of Pennsylvania commissioned Muybridge to make a further study of animal and human locomotion. The report, "Animal Locomotion" was published three years later and still ranks as the most detailed study in this area. It contains more than twenty thousand images.

Eadweard Muybridge began a new series of lecture tours in the United States, Britain, France, Germany, Switzerland and Italy following publication of his Animal Locomotion in 1887.

At that time photographers were also able to look back at the work of their predecessors. Thomas Annan's son James Craig Annan made a major contribution to our knowledge of early English photography, and was instrumental in the publication of a great deal of photographic material. He reprinted the work of Hill & Adamson, whose studio and negatives had been taken over by his father in 1899. The subjective impression and the expression of inner experience had become major elements of the light drawing.

There was a highly stylized quality in the work of

photographers such as Jackson, Watkins, Vroman and Thomson who carefully directed the 'types' they were photographing. Looking at the composition and photographic approach used by these photographers, one gets curious to know more about their training, their remarkable interest in (non-)Western influences and the manner in which they incorporated these influences into their work.

Developing mechanical means for printing photographs with a printing press or lithograph was a major concern for 19th century inventors. Finally, around 1870 a practical means of photomechanical reproduction became available, but it was not very good at reproducing gray shades. Later, around 1880, the halftone method was perfected, allowing accurate reproduction of photographs at reasonable cost and giving rise to many illustrated magazines and newspapers.

Pictorialism was an international movement, but the first Pictorialist association, the Photo-Club de Paris, was set up in France in 1888 by Robert Demachy, and the first Salon was not held until 1894. Demachy was a independent rich man from a banking family who was passionate about photography. He was highly cultivated and a remarkable technician who, with the help of Alfred Maskell, encouraged an interest in the typically Pictorialist gum bichromate method developed by Rouillé-Ladevèze in 1894. Demachy choice of theme was often inspired by Depas'painting, although there can also be a symbolist side to his work.

Initially, photographs were limited in size by the size of the camera and photographic plate. One of kind photos like daguerreotypes were of course of the size of the plate used to make them. With glass plates, placing the plate against a sheet a paper and letting light pass through the negative, produced a photo of exactly the same size as the negative. A process for enlarging prints was invented in the late 1850's but it was only during the decade1880–1890 that it became widely available.

The magic of photography caught the popular imagination as soon as it became known and available. After 1888 almost every aspect of everyday life became subject to photographic record, and a boom that goes on even today, was born.

JOHAN SWINNEN

See also: Emerson, Peter Henry; Stieglitz, Alfred; Muybridge, Eadweard James; Jackson, William Henry; Watkins, Carleton Eugene; Thomson, John; von Stillfried und Ratenitz, Baron Raimund; Motion Photography; Marey, Etienne Jules; Annan, Thomas; Annan, James Craig; War Photography; Eastman, George; Camera Design: 6 Kodak (1888–1900); Carbutt, John; Vogel, Hermann Wilhelm; Royal Society, London; Robinson, Henry Peach; Davidson, George; Brotherhood of the Linked Ring; Naturalistic Photography; and Picturalism.

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HISTORY: 8. 1890s

Nineteenth-century international photography is a rich and above all surprising field. To those accustomed at looking at drawings or prints, the photographic medium was characterized by extreme directness and clarity. The photograph, or 'light drawing,' had a strong attraction. Its qualities were considered to be the realm of depiction, the composition of light and shade and the rendering of space. Art critics summed up the strength of the new medium's 'secrets of light and brown.' Right from the start, photography was used for various scientific and documentary purposes. It was also the object of artistic interest. Even by the pioneers: William Henry Fox Talbot practiced photography as a kind of alchemy, seeking tangible depictions. David Octavius Hill and Robert Adamson used the medium as an exercise in portraiture. Samuel Bourne, accompanied by a large retine of sherpas, toured the Himalayas in order to register photographic impressions of great heights.

The first photographs were exhibited to the public as early as the first decade after its invention. At first the results of photography were displayed alongside other exhibits at world fairs. Very quickly special –often-international—photographic fairs were held, where photographers showed their prints. Clarity, definition, color and the choice of photographic procedure were the criteria applied in judging the exhibits.

The appearance and treatment of this new art form constitute an interesting facet of 19th-centrury-art history. Photographers adopted the genres and pictorial traditions of paintings and printmaking. Portraits, landscapes, architectural views and genre scenes were popular photographic themes. Photography was viewed and assessed in the context of historical and contemporary artistic movements. The photographers of the late 19th-century took their subjects and genres from 17th-century Dutch painting or the literary themes of their artist-contemporaries. Raphaelesque compositions and Rembrandesque chiaroscuro were stylistic devices, which were imitated in photography. Numerous links and correspondences can also be observed in the training, background and studio practice of painters and photographers.

The explosion during the 1890s in amateur photography came at a propitious moment in the cultural history of America. Despite the boom in the camera market, the term detective continued to be applied to a variety of the hand cameras introduced to be applied to a variety of the hand cameras introduced before the turn of the century. Among the professional photographers, considerable discussion began to take place among those who advocated the use of small versus large cameras. Cameras able to accept large plates had traditionally been used to make many of the finest photographs of exhibition caliber, but enlargement had become a simpler matter from negatives made with the new hand cameras.

There was plenty to discuss in the professional trade, as well as among the amateurs, and from these discussions and debates appeared a new group of periodicals, particularly aimed for a permanent market of amateur readers. The three prime new publications, all of which first appeared in 1889, were the American Amateur Photographer, the *Photo-American* and the *Photo-Beacon*. All were discontinued in 1907, perhaps a telling indication of just how long their subscribers were interested in reading up on photography before accepting the camera as just another adjunct of everyday living.

In many aspects this was photography's most eclectic moment. Not only was there much that was new to choose from in equipment and apparatus but there were many choices to be made, as well, in processes. Still to come were entirely new dimensions, both in portraiture and in the means of printing artistic photographs for public exhibition and sale. Perhaps because of all thee innovations there something of a lull in commercial business in 1892. It was a rush to cheapness and quantity which blamed for the fact that among people an the class who in former years were liberal patrons and are able to pay good prices, it is no longer fashionable to display photographs, except as mere cheap souvenirs, and as a possible basis for future use in copying.

When Alfred Stieglitz returned to the United States in 1890, he soon realized, he said 'that photography as I understood the concept, hardly existed in America.' Because of his first-prize award at an 1887 London amateur photography competion, and the favorable recognition accorded him by European artists as well as photographers, Stieglitz became the sole American to actually participate in the movements begun at that time in England, France, Germany and Austria to elevate photography to its rightful position as a fine art. Stieglitz was generally correct in his 1890 appraisal of the death of fine-art photography in America, but there was an encouraging note, which had occurred prior to this at the 1887 joint exhibition of photographs in NY by the amateur societies of NY, Boston and Philadelphia. In the period 1890-94, there other isolated events which indicated that the movements across the Atlantic were having an effect on American photographers. In 1890 for example 'impressionism' in photography was chosen as a topic of discussion at the Pacific Coast Amateur Photographer's Association and in 1891 forty American

photographers attempted to exhibit 350 photographs at art photography exhibit in Vienna.

More than any other single individual, Alfred Stieglitz provided a motivating force for an American art photography movement. This was further by his assumption of co-editorship of the American Amateur Photographer in 1893. At the time this occurred, Stieglitz and several partners were operating a photoengraving company which after 1893 supplied a number of halftone reproductions as illustrations for the American Amateur Photographer. About 1892, Alfred Stieglitz saw some prints of size 4 × 5 inches made with a hand camera, which he found extraordinarily beautiful. Thereupon he decided to buy a hand camera and master its use. He made a series of photographs provided photography and art 'with a new motive' as city snow scenes. He played a major role first in the amalgamation of the NY societies in 1896 and ultimately in the founding in 1902 of Photo-Secession, the American counterpart to the Linked Ring.

The best that could be achieved with color photography in the nineteenth century was perfected experimentally, or bought to a viable commercial status in the period 1893 to 1895. Although prints in color could not be obtained from color negatives or color film in an ordinary camera, several methods were perfected which allowed people to view photographs in color on a screen, and, after 1893, good half-tone illustrations could be produced in color on a photoengraver's letterpress.

The choice of which paper to use in making photographic prints—whether for professional studio work or for exhibition purposes—remained more of a problem in the last decade of the nineteenth century than is perhaps generally recognized. Frequently, it is simple stated that the old reliable albumen paper was replaced by the gelatine-bromide papers about 1890.

The flowering of American fine-art photography, which had begun in a small way after 1890, came to its first fruition with the staging of an European-style photographic salon at the Philadelphia Academy of Fine Arts.

Photography was poised for a coming age of mechanization as the world passed into its twentieth century. There were by this time 100,000 Kodak cameras alone in the hands of amateurs making photography easier and more accessible.

Printers and sculptors discarded traditional methods, using photographs as preparatory for their compositions. From 1890 as photographic techniques were radically simplified an increasing number of artists, painters or sculptures began to take their own photographs of models or ask professionals to take shots according to their instructions.

Pictorialism only represented one part of the artistic production of the period 1890s. Most photographers were forced to work to earn a living and so continued to do journalistic work, in which they reproduced and documented the real world without trying to filter it through any particular techniques meant to reflect their individual artistic vision.

Eugène Atget is of quite a different stature. Between 1898 and 1927, the year of his death, he systematically roamed Paris documenting every street, which was destined for destruction in the near future. Thousands of church facades and townhouses from the Middle Ages right up to the 18th century were recorded photographically on an impressive scale. His style and visual technique were original and innovative as his project. He was probably well aware of hiss abilities, despite the fact that he worked more like a simple craftsman than an artist, selling his work to architects, illustrators and painters. The Surrealist were the first to draw attention to his work for its artistic merit, by publishing it in their journals.

The issue of whether or not photography could be art became an important issue in the early 1890s with the Secession movement, which was spearheaded in 1893 by the founding in London of the Linked Ring, a rival group to the renamed Royal Photographic Society of Great Britain. Seeking a pictorialism independent of science and technology, the Secessionists steered a course between academicism and naturalism by imitating every form of late Romantic art that did not involve narrative. Equally antithetical to their aims were Realist and Post-Impressionist painting, at that time at their zenith. In the group's approach to photography as art for art's sake, the Secession had most in common with Whistler's aestheticism. To resolve the dilemma between art and mechanics, the Secessionists tried to make there photographs look as much like paintings as possible. Rather than resorting to composite or multiple images, however, they exercised total control over the printing process, chiefly by adding special materials to their printing paper to create different effects. Pigmented gum brushed on coarse drawing paper yielded a warm-toned, highly textured print that in its way approximated Impressionist painting. Paper impregnated with platinum salts was especially popular among the Secessionists for the clear grays in their prints. Their subtlety and depth lend a remarkable ethereality to Gertrude Käsebier's photographs in which spiritual forces are almost visibly sweeping across the photograph. Through Käsebier and Alfred Stieglitz the Linked Ring had close ties with America, where Stieglitz opened his Photo-Secession gallery in New York in 1902.

Peter Henry Emerson felt the artificiality of the Robinson school, and he put forward another point of view against the latter's theories which he named naturalism, and which he described in his Naturalistic Photography, first published in 1889. He believed that

photography was potentially a great creative art, and that it did not need to be bund down to rule set up for painting. 'Naturalism' he wrote, 'is an impersonal method of expression, a more or less correct reflection of nature wherein' truth of sentiment, illusion of truth of appearance (so far as is possible) and decoration are of first and supreme importance.

Emerson sought a scientific basis for pictorial photography. He analyzed the physiology human perception. He reasoned that since the eye sees distinctly only a small part of what lies before it, while the surrounding area appears indistinct, it should be possible to reproduce this phenomenon by controlling the focusing. Only a small part of the photograph should be sharp, the rest should be just slightly out of focus. Today we recognize that this theory of vision is fallacious, because the eye, unlike the lens of a camera, is a living organism, which scans the field of view constantly in such a way that the mind receives a composite report and the impression of full detail. The naturalistic theory was an advance over Newton's; for Emerson believed that the photographer should rely entirely on controls which were they part of the photographic process. In addition to control through differential focusing, he advised the careful use of developing and printing methods.

Emerson took a large number of photographs of the amphibious life of the simple country folk on the Norfolk Broads, which were entirely different of the artificial genre studies of Robinson and very close to the graphic work of J. F. Millet, which Emerson greatly admired. Imbued with a deep artistic feeling, Emerson's photographs fired a number of other amateurs to seek inspiration in nature as the first generation in limited editions in handsome folio volumes as original platinum prints or as photogravures and photoetcings.

There was a profound shift in the perception of photography around 1890. Discussions of photography were largely qualitative, e.g. is it an art or a science? The science of photography was largely of an alchemical sort. The scientific questions were also qualitative, due to the failure of photographic "evidence" to fit existing theories of the behavior of light. Were there new "imponderables" (phenomena without mass) to contend with besides light, heat, magnetism, and electricity? The questions were ones of kind, not relationship. That is, until Hurter and Driffield.

James Clerk Maxwell suggested in 1862 that magnetism, electricity, and light were all manifestations of a larger electromagnetic spectrum. However, it wasn't until he published Electricity and Magnetism in 1873 that the idea began to take hold. Suddenly, the questions asked about the behavior of photosensitive materials took a different form. They became mathematical in nature: what was the relationship between exposure to light and photographic material? Instead of questioning the qualitative nature of light, as researchers such as Hunt and Draper had done, researchers began to look for better methods of measuring light quantitatively and exploring the relationship between exposure and response in photographic materials.

Film speeds were first scientifically measured around the 1880s to 1890s with initial work by Sir William Abney but continued and published in 1890 by Ferdinand Hurter and Vero Driffield, working at the centre of the UK chemical industry in Widnes.

The birth of photography as a modern science seems to have occurred circa 1880, with the invention of the actinograph (light meter) by Hurter and Driffield and the first motion studies of Muybridge. Both these efforts were carefully measured and mathematical in nature. The intense period of experimentation in the 1880s was fueled both by a technological need and a desire to have proof of a measurable nature. The shift during this time from relatively forgiving wet plates and the more tricky but convenient dry plates was part of the equation—photographers needed better instrumentation than "rules of thumb" to get consistent exposures. However, the one of the first uses of the actinography was to mathematically establish the relationship between the position of the sun in the sky to light intensity. Motion studies were used to establish the relationships between muscle groups and motion, rather than to create more accurate depictions of motion. At issue in both types of research were matters of detection rather than depiction.

The culmination of Hurter and Driffield's research was the characteristic curve used to measure photosensitive materials—named the H&D curve in their honor. With the discovery that there was a mathematical relationship between exposure, development, and density in photosensitive materials in 1890, photography became scientific in the modern sense. Their work plotted image density against the logarithm of exposure, producing what became known as 'H&D' or 'characteristic' curves. These curves had a straight line section which could be extrapolated back to the density axis to give a speed point that could be used to compare materials, and speeds based on these were known as 'H&D' speeds.

Around the same time, Jules Scheiner in Germany introduced a cruder method based on the minimum exposure required to give a perceptible image in 1894. The work of Hurter and Driffield was extended by the German company Agfa in the 1920s to incorporate the less steep portion of the curve at lower exposures to produce a more practical measure accepted as a national standard (DIN) in 1931. The Weston Company in America introduced their own speed system designed to work with the integrated light readings of their famous exposure meter in 1932 (WESTON). Similar considerations and the increasing deviation of modern materials and developers from straight line responses led to the

original ASA system (1943) and the BS / DIN / ASA international standards of 1960–62.

The scientific findings of Hurter and Driffield led Emerson in 1891 to renounce the art claims he had made for photography. A great artist, he said, had shown him that the reproduction or translation of nature was not art. The fallacy of this argument was based, of course, in the definition of art. It appeared that 'art' and 'painting' was almost synonymous to Emerson when he wrote his retraction. What really happened was that Emerson preaching on differential focusing led to the use of very focusing lenses and other blurring effects such as the use of very coarse paper. Emerson dramatically announced his views in a black-bordered pamphlet *The Death of Naturalistic Photography*.

In his book Emerson had a good deal to say about photographic exhibitions. He felt that they were poorly organized. He recommended that photographs be framed in simple white molding and that they be exhibited on one line in galleries, not plastered over the wall with the frames practically touching them. He rightly felt that pictorial photographs should be isolated, instead of being lumped together with work done for scientific, technical, and other no aesthetic purposes.

Dissatisfaction with the scientific bias of the Photographic Society under the presidency of Sir William Abney caused a split in the society in 1892. A group of pictorially minded members, under the leadership of H. P. Robinson and George Davison, formed a society for the exclusive purpose of furthering 'the development of the highest form of art of which photography is capable.' The society was named Linked Ring. They held annual exhibitions which they referred to as *salons*, a name borrowed from the painting world, and which demonstrated their artistic motivation. By 1901 it was their proud boast that 'through the *Salon* the Linked Ring had clearly demonstrated that pictorial photography was able to stand alone and that it had a future quite apart from that which is purely mechanical.'

Meanwhile Edward S. Curtis was considering what was eventually to be one of photographer's major entrepreneurs. In 1896 he had begun a survey of Indian Life in North America. Needing financial assistance, he eventually turned to J. Pierpont Morgan and in 1907 published the first of the twenty volumes, which finally made up The North American Indian. The project occupied Curtis until 1930. He began his survey with reports on Apaches, Jicarillas and Navahoes and ended with Eskimo tribes in Alaska.

When Kodak introduced the $1.00 Brownie box roll-film camera in February of 1900, it was an immediate success, but with one problematic flaw—the shoebox-style, cardboard back wore out quite quickly, leaving the roll film inside more susceptible to light leaks. To fix the problem, Kodak engineers created a metal latch to hold a new rear cover in place, and the problem was fixed. The original Brownie Camera was only in production for about two months, and is quite rare today. Eastman Kodak company records indicate that many of these first Brownie Cameras (about 15,000) were shipped to England. The Brownie Camera with its new back door design would go on to be known as the No. 1 Brownie Camera in 1901, when the larger No. 2 was introduced necessitating a new name and model designation. This was the same procedure Eastman Kodak used when it released both the original Kodak Camera, and the first Folding Pocket Kodak camera.

During the nineteenth century, photography struggled to establish itself as art but failed to find an identity. Only under extraordinary conditions of political upheaval and social reform did it address the most basic subject of art, which is life itself. In developing an independent vision, photography would combine the aesthetic principles of the Secession and the documentary approach of photojournalism with lessons learned from motion photography. At the same time, modern painting, with changes in photography undermining its aesthetic assumptions posed new challenges to its credentials as one of the arts. Like the other arts, photography responded to the three principal currents of our time: Expressionism, Abstraction and Fantasy. But because it has continued to be devoted for the most part to the world around us, modern photography has adhered largely to realism and, hence, has followed a separate development. We must therefore discuss 20-century photography primarily in terms of different schools and how they have dealt with those often-conflicting currents.

The course pursued by modern photography was facilitated by technological advances. It must be emphasized, however, that these have enlarged but never dictated the photographer's options. Surprinsgly, even the introduction of color photography by Louis Lumière in 1907 had relatively little impact on the content, outlook, or aesthetic of photography, even though it did remove the last barrier cited by nineteeth-centrury critics of photography as an art. Photography did create a new art form, the cinema. An outgrowth of motion photography also came to perfection in 1894 thanks to Lumière and his brother. Unfortunately, we are unable to treat it in our surrey, because the printed page cannot reproduce continuous action or sound.

Other photographers used the medium far more directly, as a means of registering people, setting and experiences. This specific dimension of photography was eminently reflected in the work of the documentary photographers, showed plied their trade in the far corner of the globe. Despite their commercial concerns, they had ample opportunity to record their exotic surroundings, and they often did so with considerable inspiration. Their cameras enabled them to record not only every-

day events, but also less common scenes and objects. Some of them invented documentary commissions for themselves. The studios of Woodbury & Page, Samuel Bourne, William Henry Louis Skeen and Charles T. Scowen, produced photographs of the highest quality, among them, over and under one another in a more or less haphazard manner.

Stieglitz had been introduced to the technique of photography in Europe, during a period of radical change within the world of the fine arts. Seeing his photographic work, painters proclaimed that it would have been superb if only it had been executed with a brush. The borderline between photography and painting was becoming blurred, a development that was closely linked to what resulted in a revolution in the general approach to painting. Since the advent of Impressionism, the representation—what was depicted in the painting—was becoming less and less important. Abandoning the representation, artists were increasingly using texture and surface structure to create to create a mood or an impression. These views understandably struck a sensitive chord with photographers.

At first nude photography was even banned from some photographic society exhibitions, but gradually a number of conventions evolved—some adapted from painting—which made it respectable in the salons of pictorialism. These involved a strange desexualisation of the aesthetic female nude by strategic placement of props, 'tasteful' posing, soft focus and retouching of all body hair. Such conventions continued in much amateur photography and 'soft pornography' into the second half of the twentieth century.

Another widely available source of pictures of naked and near naked men and women were various photographs and articles of anthropological nature, illustrated by people in traditional costumes from around the world. Perhaps the main scientific finding that could be deduced from these was the fascination of many photographers (and magazine readers) with cultures where young and nubile women lived bare-breasted.

The male nude was both less common as a subject and also less problematic, both largely as it was not regarded as a sexual object by the dominant male heterosexual culture. So long as the male organ was not aroused it was acceptable, and some photographers such as Baron von Gloeden, photographing young boys in a Sicilian village, took great advantage of this freedom. Of course being titled and extremely wealthy also helped.

Outside of the light world of artistic photography other practices flourished—the saucy postcard, so-called artists studies and other soft and hard-core pornography. Much of this has been repackaged as art books in recent years, as well as being available through postcard dealers and web sites.

Among the interesting collections from this period are the photographs taken in New Orleans by E. J. Bellocq. These pictures showing girls from the Storyville brothels in their rooms, relaxing in front of the camera, are an intriguing and valuable document of the era.

During the 1890s photography has advanced by leaps and bounds. The first film was developed late in the 19th century, made of a dried gelatin. This film was very fragile and did not gain widespread popularity. Then in 1889 a nitrate based, plastic roll film was developed. Due to a tendency to curl, this film also lacked popularity, but in 1903 a non-curling variety was developed, and began to be widely used, and in 1913 the film became available in sheet form and began to compete with the glass plate negative, which it eventually supplanted.

The photographic papers in use in this century tend to be sturdier than those of earlier years, so the practice of pasting them to cardboard mounts was mostly dropped. Professional photographers still used cardboard backings, sometimes folding cards that covered the front of the photo as well and could serve as a stand, but the picture was just slipped into slots in the mount, or tacked lightly in one spot to hold it in place.

Having passed through the stages of invention and the first attempts at commercialization, by the end of the 1900s, photography was ready to cross the threshold separating a technological medium, still uncertain of its future, from a commercial and artistic activity recognized and solidly integrated into society from museum, universities and art-schools.

JOHAN SWINNEN

See also: Talbot, William Henry Fox; Hill, David Octavius, and Adamson, Robert; Bourne, Samuel; Riis, Jacob August; Royal Society, London; Käsebier, Gertrude; Stieglitz, Alfred; Emerson, Peter Henry; Robinson, Henry Peach; Hurter, Ferdinand, and Driffield, Vero Charles; Abney, Willam de Wiveleslie; Davison, George; Curtis, Edward Sheriff; Lumière, August and Louis; Woodburytype, Woodburygravure; Skeen, W.L.H.; Scowen, Charles; Sutcliffe, Frank Meadow; Evans, Frederick H.; White, Clarence Hudson; von Gloeden, Baron Wilhelm; Brotherhood of the Linked Ring; Naturalistic Photography.

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HOFMEISTER, THEODOR (1863–1943) AND OSKAR (1871–1937)

German photographers

Theodor worked as a wholesale merchant and Oskar was a secretary in the county court. The brothers Hofmeister began exhibiting photography in 1897 in Hamburg and produced their photographs as a team effort; later Oskar took the photographs and Theodor made the gum prints, often the scenes to be photographed were firstly sketched by Theodor. In 1895 they were producing picture postcards, from 1897–1899 figure studies of local people in traditional costumes. Influenced originally by Heinrich Kuehn, who taught Theodor gum printing, and the *Wiener Kamera Klub* (Vienna), they were to become known essentially for their gum bichromate landscape images, usually featuring a low horizon, with intelligent and original use of colour and composition that allowed a dialogue on the relationship between man and nature, as distinct from the often trite and sentimental landscapes of fellow Pictorialists. Their photographs were collected by museums, including Hamburg and Dresden and exhibited internationally. In 1909/10 they stopped gum printing and thereafter produced straightforward bromide prints. They were members of the Hamburg Pictorialists, established by Ernst Juhl in 1883, and *Die Gesellshaft zur Forderung die Amateur Photographie*. Along with Rudolf and Minya Dührkoop, also from Hamburg, they became members of the British 'Linked Ring Brotherhood' in 1908. In 1902 they began teaching and were known for being helpful to other aspiring photographers.

ALISTAIR CRAWFORD

HOGG, JABEZ (1817–1899)

British opthalmic surgeon, microscopist, photographer, journalist

Hogg was born in Chatham, the youngest son of John Hogg of the Royal Dockyard. Like his schoolfellow Charles Dickens, Hogg would become a prolific, wide-ranging, and politically conscious author. An overview of Hogg's career points toward the fruitful interconnections in mid-nineteenth-century Britain between science or natural philosophy on the one hand and literature and popular journalism on the other. Hogg's interest in photography may be seen as one of several points of connection between these spheres, as is suggested by his abiding fascination with the metaphor—which struck him as both mechanical and poetic—of the camera as a human eye.

In 1840 Hogg entered the medical profession, indentured to Hugh Welch Diamond. He clearly assisted Dr Diamond in his pioneering experiments in using photography for scientific documentation, for by 1843 he had learned enough from the distinguished physician to publish *The Practical Manual of Photography*. That same year Hogg joined the staff of the *Illustrated London News*, which immediately gave him a forum for disseminating information about the new art-science. (The first specialist journals were of course still a decade away.) The iconic quarter-plate daguerreotype of Hogg making a portrait, often described as the first known image of a photographer at work, was probably made in 1843 to illustrate *The Practical Manual*. A wood-engraved reproduction appeared in the book, and also in the *Illustrated London News* (19 August 1843), where it accompanied "Lines Written on Seeing a Daguerreotype Portrait of a Lady" by Miss Elizabeth Sheridan Carey.

This single image tells us much about early daguerreotype practice in London. According to a footnote accompanying the *Illustrated London News* reproduction, the setting is "Mr. Beard's establishment, Parliament-Street, Westminster." One of Richard Beard's three daguerreotype portrait studios, the Parliament Street establishment had opened on 29 March 1842, about a year after the coal merchant purchased a patent from Jacques-Louis-Mandé Daguerre's agent Miles Berry to practice the technique and to sell licences to others in England, Wales, and the colonies. Hogg—given his extensive prior experience in photography and his diverse commitments as a physician, writer, and editor—was presumably one of Beard's associates and licensees rather than an operator under his employ. Hogg built a studio of his own onto his home in Barnsbury Park, Islington, around this time.

In the daguerreotype of Hogg at work, the camera, positioned on a stand with a rotating plate, helps to date the image to spring or summer 1843. Until that time, Beard's studios had used Alexander Simon Wolcott's concave-mirror cameras with ordinary lenses, ideal for daguerreotype portraiture because they reflected daylight onto sitters through a copper sulfate trough that turned the light blue. Beard had obtained the right to use this invention from John Johnson, Wolcott's partner in New York's "Daguerrean Parlor," who came to London in November 1840 to assist in establishing Beard's Royal Polytechnic studio. Johnson's father, William S. Johnson, had preceded him by some months to initiate the business arrangements, and it is he who is the sitter in Hogg's daguerreotype. However, the camera seen here is not one of Wolcott's design: rather, it features the Petzval-type portrait lens that superceded the mirror camera in terms of speed and focal length. Hogg has removed the lens cap and is timing the exposure on his pocket watch (depending on the lighting conditions, it would have been five to eight seconds). Johnson poses

stiffly in an armchair, his head fixed in a rest and his hands clenched so as not to move. Elaborate studio props fill out the scene: patterned carpet; upholstered footstool with top hat; painted backdrop with a trompe l'oeil birdcage, trellis, flowering plant, and bench; heavy cloth drape; and sculpted bust. Typical products of the Beard portrait studio would have employed these objects in highly conventional ways. Hogg, by contrast, showed greater compositional dexterity in this and other examples of his work.

Although Hogg seemingly practiced photography with experimental and didactic motivations, he maintained a keen awareness of contemporary debates relating to commerce, taking a public stand against the two most bitterly resented patent holders of the period, Beard and William Henry Fox Talbot. In 1845 Hogg anonymously published a pamphlet entitled *Photography Made Easy*, its agenda to rally support for John Egerton, the defendant in a case brought by Beard that was resolved in the latter's favor in 1849—after 5½ years in the courts. In 1853 Hogg took issue with Talbot's patent on all photo-engraving processes, which prevented him from illustrating his book *The Microscope* with photographs transferred onto wood blocks.

Hogg's involvement with photography complemented several other areas of achievement. During a forty-five-year medical career, he served for twenty-five years as a surgeon to the Royal Westminster Ophthalmic Hospital and published books on color blindness (1863), cataracts (1871–82), ophthalmic surgery (1863), and the impairment of vision due to spinal injury (1876). Other medical topics of interest to him were dentistry, skin disease, and arsenic poisoning.*The Microscope* remains the best known among Hogg's many books; first published in 1854, it was in its fifteenth edition by the time of his death. His work in microscopy led him to posit the connection between diseases and contaminated water, and Hogg was among the first to call for the purification of London's water supply. Committed to presenting scientific ideas to a popular readership, he produced a series of "illustrated educational books" under the auspices of the *Illustrated London News* (1850–66), and he edited the periodical's annual *Almanack* for an astonishing 51 years.

In 1894, perhaps reviewing the artifacts of a long and intensely productive life, Hogg gave a collection of 20 daguerreotypes to the Royal College of Surgeons. These images, together with the text of his *Manual* and other writings on photography, demonstrate that Hogg possessed aesthetic sensibilities in addition to scientific acumen. He was certainly moved and inspired by the possibilities offered by the new technology: "When we consider that Photography enables us to preserve from the decay of time and the fickle tenure of mortality, the true type of the features of those we love, our admiration and gratitude can scarcely be excessive." Hogg died in London in 1899.

BRITT SALVESEN

Biography

Jabez Hogg was born in Chatham on 4 April 1817. Trained as a physician under Dr. Hugh Welch Diamond, he was an early practitioner of the daguerreotype, ambrotype, and calotype processes. His *Manual of Practical Photography* was first published in 1843. Hogg served on the staff of the *Illustrated London News* from 1843 to 1895, and also practiced medicine (specializing in ophthalmic surgery) for 45 years. He is best known as a pioneering microscopist. He died in London in 1899.

See also: Daguerreotype, History: 1, Patents; Diamond; Hugh Welch; Illustrated London News; Beard, Richard; Daguerre, Jacques-Louis-Mandé; Wolcott, Alexander Simon, and John Johnson; and Talbot, William Henry Fox.

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HOLLYER, FREDERICK (1837–1933)

British engraver, photographer of fine art, and portraitist

Frederick Hollyer was born in London in 1837, the youngest of four boys. His father, Samuel Hollyer (1797–1883), was a line engraver, fine art publisher and collector of watercolours. Frederick began his career as a mezzotint-engraver, reproducing two works by Edwin Henry Landseer, the *Shepherd's Grave* and *The Old Shepherd's Chief Mourner*, published in 1869 (V&A). Around 1860 he took up photography and became a member of the Photographic Society of London in 1865. The same year he photographed sketches by the artist Simeon Solomon who introduced him to the Pre-Raphaelite artists and their followers. In 1870 Hollyer opened a studio at 9, Pembroke Square, Kensington, London. In the early 1870s he was employed by the eminent artist Frederic Leighton to photograph his paintings and drawings.

Although he also photographed the works of old masters, such as the Hans Holbein pictures in the Royal Collections at Windsor Castle, most of Hollyer's output reproduced the work of his contemporaries. His clients grew to include many artists associated with the Pre-Raphaelite and Aesthetic Movement such as Dante Gabriel Rossetti, Simeon Solomon, Sir William Blake Richmond and Albert Moore. Hollyer became particularly closely associated with George Frederick Watts and Edward Burne-Jones and made many fine reproductions in a collaboration with the artists lasting many years. Working closely with such artists, Hollyer made photographs of works in progress—the prints often suggesting modifications to the artists - that are valuable today in revealing the different states of the pictures and the draftsmen's working methods. He established himself as the leading specialist in the photographic reproduction of artworks in England that sold widely in Europe, and did played a major role in popularising the artists' works. Hollyer's reproductions were regarded as more than a type of facsimile. In Mrs. Russell Barrington's *The Life, Letters and Work of Lord Leighton* (London 1908, vol. II, 288*)*, the artist George Frederick Watts noted, "Mr. Hollyer's photographs are not merely copies—they have as art an atmosphere of charm in themselves; they render what may be called the *soul* of a picture." Hollyer himself proclaimed, "I am quite convinced that something, call it art or what you will, but something more than mere mechanical and scientific excellence, not only can, but should, find its way into every print from every negative that leaves the photographer's studio" (*The Studio*, vol. 1, 1893, 194).

Hollyer made albumen prints from collodion negatives, e.g. *Eight Designs for the Song of Songs by Simeon Solomon* (V&A) and prints on unglazed salted paper until around 1878. However, his subsequent use of gelatin dry plates coupled with platinotype printing (introduced in 1873) significantly improved the quality of his reproductions. With their matt finish, platinum prints rendered the surfaces of pencil or charcoal drawings with great veracity and tonal subtlety. Many of Hollyer's platinum print photographs of drawings are difficult to distinguish from the original, especially when presented in mounts and decorative frames of the period. He became well known for his fastidious workmanship and corresponded with Frederick Evans, another of the chief exponents of the medium, on platinum printing techniques.

Hollyer gained a high reputation among artistic and literary circles through his work that gave him a privileged level of access to a wide range of notable society figures. He took this opportunity to make a great many revealing and intimate portraits. His gift for portraiture, which he is modestly said to have practiced "for relaxation," was carried out, for some thirty years, on the Mondays reserved for sitters who visited his studio. Three albums of platinum prints in the V&A collection contain just under two hundred portrait photographs and show the panoply of contemporary celebrities who sat for his camera. The albums are titled *Portraits of Many Persons of Note Photographed by Frederick Hollyer* and are inscribed to Hollyer's daughter, Eleanor, dated 1920. The portraits are meticulously titled, dates and indexed, many accompanied by the sitter's autographs cut from correspondence. They show many artists, including William Morris, Burne-Jones, Ford Madox Brown, William Holman Hunt, Simeon Solomon, G.F. Watts, Albert Moore, Lawrence Alma Tadema, John William Waterhouse, Aubrey Beardsley, Walter Crane and Camille Pissarro, as well as writers such as John Ruskin, Walter Pater, W.B. Yeats, H.G. Wells and George Bernard Shaw and celebrities such as the actress Ellen Terry. Hollyer's self-portrait occupies the final page of the last volume. Collectively, these works form an astonishing profile of late-nineteenth century cultural life in England.

Today Hollyer is best known for his reproductions and portraits, although there is evidence of his involvement in fine art photography - rather than the photography of fine art. In 1893, *The Studio* published an interview with Hollyer that reproduced five of his original landscape photographs, among them a view of the Thames and Waterloo Bridge. The captions note that the photographs are 'untouched' and a large part of the interview is concerned with advocating the purity of making photographs that had not been subjected to what Hollyer described as the 'fatal crime of touching and retouching negative or print'.

In 1893 Hollyer became a member of the Linked Ring and in 1895 Fellow of the Royal Photographic Society. In 1902 an exhibition of Hollyer's photographs was held at Egyptian Hall, London. A number of the photographs were presented in frames designed by Hollyer and by G.F. Watts. The catalogue of the exhibition also lists photographs of works by Botticelli, and other artworks made from collections in Florence and The Hague, by Hollyer's eldest son, Frederick T. Hollyer. Frederick Hollyer retired from active work in 1913 but his two sons Frederick T. and Arthur S. Hollyer carried on the business of fine art reproductions. The Hollyers' large stock of images was advertised in the *Catalogue of Reproductions of Pictures & Sculpture…*(1924). This included much of Hollyer's previous stock as well as reproductions from artworks at The National Gallery and Tate Gallery London, Museums in Dublin and Edinburgh, the Uffizzi and the Louvre. It offered prints ranging from 13 × 10 inches (33 × 25.4cm) to 36 × 24 inches (91.4 × 61cm) available on platinum or bromide paper in grey or sepia tone and with some reproductions produced in colour. For the last two years of his life

Frederick Hollyer lived with his eldest son at Blewbury, Berkshire, where he died at the age of ninety-five on 21 November 1933. The funeral took place at Reigate Cemetery on 24 November.

MARTIN BARNES

Biography

Frederick Hollyer was born in London in 1837. In 1870 he opened a studio in London. Most of Hollyer's output reproduced the work of his artist contemporaries among whom were Dante Gabriel Rossetti, Frederic Leighton, G. F. Watts, Albert Moore and Edward Burne-Jones. Hollyer's fine platinum print reproductions were highly regarded and did much to popularise the artists' works in Britain and abroad. Alongside this work Hollyer also made a great many revealing and intimate portraits. His subjects included many of the most important artistic, literary and society figures of the day. He also made landscape photographs, among them views of the Thames, some of which were reproduced in an illustrated interview with him in *The Studio* (1893). Hollyer prided himself on his immaculate technical skills and advocated making 'untouched' negatives and prints (i.e. images which had not been altered by retouching at any stage during the photographic process). In 1893 he became a member of the Linked Ring and in 1895. He retired from active work in 1913 and died at Blewbury, Berkshire, the age of ninety-five on 21 November 1933.

Collections

National Media Museum, UK: 60 platinum prints, mostly portraits, some London scenes. Sales catalogue, letters, press cuttings.

Victoria and Albert Museum, UK: numerous reproductions of artworks, vertical panorama flower study, portraits of Morris and Burne-Jones families, three albums *Portraits of Many Persons of Note Photographed by Frederick Hollyer.*

University of Middlesex, Silver Studios archive, London UK: collodion and gelatin dry-plate negatives.

Jewish Museum, London, UK: Photographs of works by Simeon Solomon, *Eight Designs for the Song of Songs by Simeon Solomon* (1878) and *The Book of Ruth* (1879).

See also: Photography in Art Conservation; Photography of Paintings; and Photography of Sculpture.

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Mr. Frederick Hollyer's exhibition of platinotype reproductions. Catalogue of platinotype reproductions of the works of Sir E. Burne-Jones, D. G. Rossetti, G. F. Watts, R.A., and other masters: of portraits of eminent men by various painters: and of portraits from life by Frederick Hollyer. Also platinotype reproductions of the works of Botticelli and other masters in Florence, The Hague, and other places by Frederick T. Hollyer, London: Drawing Room, Egyptian Hall, 27 January–1 March, 1902.

The Times, Obituary, 24 November, 1933.

HOLMES, SILAS A. (1817–1886)

By 1851 Holmes had moved from his native Petersburg, New York and established himself in New York City in his first (of several) photographic studio on lower Broadway, alongside most of the principal photographers of that period. Although in the middle 1850s he made highly praised oversize ambrotype views of Niagara Falls, he is better known and more highly valued for his urban imagery like the handsome studies of the principal streets and monuments of New York, which he rendered as salted paper prints, about eleven by fifteen inches in size, and, sometimes. blindstamped "Holmes photographist." His productions in other formats included albumen print cartes-de-visite, among them one of Washington's tomb at Mount Vernon, and oversize cabinet cards of varying subjects ranging from the bridges of Central Park to the Catskill Mountains. In the 1860s he advertised three hundred stereoscopic views of Manhattan and its surrounds including "innumerable objects of interest surrounding this great city," while in the 1870s his subjects ranged northward to Saratoga Springs.

As well as by consistently exhibiting his work in various processes and formats, Holmes's industriousness and inventiveness were manifested by his patent for a stereoscopic camera and his 1885 publication of *Our Democracy*, a book devoted to solving the problems of "Labor and Capital."

GORDON BALDWIN

HOLTERMAN, BERNARD (1838–1885)

German photographer

Bernard Holterman was born 29 April 1838 in Hamburg, Germany. Migrating to Sydney in 1858 Holterman worked a variety of jobs before teaming up with Louis

Beyers to prospect for gold. Fortune came in 1872 when they found the largest gold nugget ever, weighing 286kg in the remote New South Wales township of Hill End. He wanted to promote Australia choosing photography as one of the main means and he became the patron of travelling photographers Henry Beaufoy Merlin and his assistant Charles Bayliss, who had already photographed many aspects of the Hill End area. They covered parts of New South Wales before Merlin's death in 1873, with Holterman continuing to support Bayliss through his travels that also took in Victoria. Holterman built a grand home on Sydney's North shore in 1874 with a camera obscura in its roof and with Bayliss they took massive panoramic exposures of Sydney on 22 in. × 18 in. plates. In 1876 Holtermann travelled extensively overseas taking Merlin and Bayliss' photographs to the Centennial Exhibition in Philadelphia and thereafter to Europe where he exhibited them at the Paris Exposition Universalle Internationale de 1878. Returning to Sydney in 1878, Holtermann displayed at the Sydney International Exhibition of 1879 and subsequently was elected to the New South Wales Parliament in 1883, practising photography as an amateur making panoramas and stereoviews. He died 29 April 1885 at St. Leonards. A collection of 3500 wet plate negatives he owned form the Holtermann collection at the State Library of New South Wales.

MARCEL SAFIER

Holdings: State Library of New South Wales, Sydney; National Gallery of Australia, Canberra.

HOOPER, COLONEL WILLOUGHBY WALLACE (1837–1912)

English, active in India, photographer, military officer

Hooper began his career at East India House in the Secretary's Department; then joined the 7th Madras Cavalry in 1858 at which time he left for India where he would serve for the next 40 years. As a young lieutenant, he became known as an enthusiastic and competent amateur photographer. This was a skill valued by Lord Canning, then Governor-General of India (1856–58). Canning had begun an informal collection of photographs documenting the peoples, lands, trades, and monuments of India to which he actively encouraged colonial officers to contribute prints. In the aftermath of The Indian Mutiny or Sepoy Rebellion, amassing information on the complex societies of colonial India became a matter of military interest. Canning, now Viceroy of India, directed the transformation of what had been a private collection into an official project of the

India Office—a vast data base of visual information and descriptive texts which would "fairly represent the different varieties of the Indian Races." The result was *The People of India: A Series of Photographic Illustrations, with Descriptive Letterpress, of the Races and Tribes of Hindustan* (London, 1868–1875), a monumental, eight volume catalogue of ethnic, racial, and caste types which included photographic portraits, physical description, geographic location, and assessment of moral character and political reliability of the subcontinents subject population. The volumes were compiled and published by J. Forbes Watson and John William Kaye of the India Office. Photographs were solicited from amateur photographers in the colonial and military service, as well as acquired from some commercial photographers. It was for this project that Lt. Hooper in 1862 was released from military duties and transferred to the 4th Cavalry, Saugor and Secunderabad, where he devoted himself almost exclusively to acquiring portraits of the peoples of the Central Provinces of India. His portraits, a three-quarter view of a single person against a plain cloth backdrop, are distinctive for the intensity of his subjects' expression and the immediacy of their presence. The portraits stand as, perhaps, the best of his photographic work.

No doubt encouraged by official support for his photography, and as "The People of India" project neared completion, he entered into a commercial venture with photographer George Western to market photographs of Anglo-Indian life under the firm Hooper and Western. Despite the commercial success of a series of twelve, staged photographs entitled "Tiger Shooting" (c. 1872), Hooper elected to remain in military service and advanced in rank: Captain, 1870; Major, 1878; Lieutenant Colonel, 1884; and Colonel in 1888.

Hooper photographed the human toll of the great Madras Famine of 1876–78—emaciated victims neatly organized by sex and age and collected like cordwood in front of official buildings. His photographs were published in Britain and he was caricatured in *Punch*, as reports circulated that he had offered no succor to the starving subjects he had caused to be brought to the settlement to be photographed. In 1885 he took part in the Third Burmese war as Provost Marshall of the Burma Expeditionary Force and made an extensive photographic record of the expedition. This was later published as *Burmah, A series of one hundred photographs illustrating incidents connected with the British Expeditionary Force to that country from the embarkation at Madras, 1st November 1885, to the capture of King Theebaw, with many views of the surrounding country, native life and industries, and most interesting descriptive notes by Lieut-Col W W Hooper* (1887). Hooper's photographic activity during the Burmese campaign led to official censure. He was brought before a Court of Inquiry to answer charges of extorting evidence and for cruel and inhumane treatment of a group of Dacoit prisoners who

Hooper, Colonel Willoughby Wallace. Deserving objects of gratuitous relief.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

had been sentenced to be executed. Hooper's attempt to achieve photographs of the execution by synchronizing his shutter release to the order to fire caused several delays just as the firing squad was on the point of firing. Witnesses felt this added unnecessarily to the emotional anguish of the condemned and he was reprimanded for inhumane treatment and suffered a temporary reduction in pay grade. *Burmah* contains a photograph of Dacoit prisoners but none of the scandalous photographs associated with the execution. A series of glass lantern slides of the campaign, published with a pamphlet of descriptive text, *Lantern Readings illustrative of the Burmah Expeditionary Force and the manners and customs of the Burmese* (1887) was offered through J. A. Laguard of London. And the same year, again with J.A. Laguard, he offered a set of lantern slides with text, *Lantern Readings: Tiger Shooting in India*. He returned to England upon retirement in 1896 and died there in 1912.

KATHLEEN HOWE

See also: Military Photography; and Ethnography.

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HORETZKY, CHARLES GEORGE (1838–1900)

Scottish survey photographer

Charles George Horetzky (Horetski), survey photographer (born Edinburgh, Scotland, 20 July 1838; died 20 April 1900 in Ontario). Educated in Scotland and Belgium, he quit his studies early to go to Australia, then Canada. From 1858 to 1869 he clerked for the Hudson's Bay Company in Canada, during which time he probably learned photography. In 1871 he was hired by the Canadian Pacific Railway to take "views of objects of interest illustrative of the physical features of the country" through which the Railway might run. However, although he did not have the appropriate training, Horetzky considered himself an engineer, not a mere photographer; and when his advice on routes was not accepted published several books and pamphlets—in which he ignores his photographic activities—condemning the final choice of routes. His final years he engineered sewage systems for the government of Ontario.

Horetzky was a pioneer in using dry plate negatives in exploration in Canada, but aside from the whole plates themselves—some of which have been retouched possibly because of defects—there is no record of his problems or successes with them.

Hortezky's importance as a photographer depends on fewer than two hundred images made in western Canada 1871–1874 showing its topography and settlements. Not only was he the first photographer to visit what is now northern Alberta and British Columbia and thus provide the earliest photographic record of the area, but images such as the railway surveyors at the elbow of the Saskatchewan River have become icons of Canadian photography.

ANDREW RODGER

HORN, WILHELM (VILÉM) (1809–1891)

Vilém Horn was born on April 10, 1809, in Boehmisch Leipa (Česká Lípa), studied at the Viennese polytechnic school, worked as a civil servant in several governmental

offices in Prague, and was named to be a skilled amateur portrait painter before he took up photography in summer 1841. His daguerreotype portraits were lively, and the portrayed look well at ease even though the procedure of making which added much to his fame besides his enourmous technical qualities. In 1854, he opened a luxurious study in the center of Prague; the same year, he started the photographic magazine, the *Photographisches Journal* which covered every practical aspect of photography as well as scientific news on methods, materials, and inventions. Most of the articles were written by Horn himself. From 1858 to 1865, V.H. ran a business of photographic supplies in Vienna and edited his magazine from there. After obtaining a concession on all territoric photographs within the Kingdom of Bohemia in 1865, Horn retired from all of his other businesses including the magazine and returned to his native town Česká Lípa. Here he documented the city's and the country's life, and he kept vivid interests in photography's progress until his death on Oct. 15, 1891.

ROLF SACHSSE

HORNE, THORNTHWAITE, AND WOOD (1841–1913)

The London firm of Horne, Thornthwaite and Wood was amongst the earliest to be actively involved in the supply of photographic equipment and chemicals for photography. The firm underwent various name changes and the individual partners appear to have operated together and on their own account at different times.

The original partnership of Horne and Thornthwaite dates from 1841 and the form of Horne, Thornthwaite and Wood from circa 1844 possibly linked to the takeover over the optical instrument business of Edward Palmer in 1845. Palmer had also been an early dealer in photographic materials. HTW was based in Newgate Street, London, and offered an extensive range of photographic cameras and equipment for daguerreotype, paper and glass processes, sensitised papers and chemicals. George Cundell's calotype sliding box camera was sold from 1844. Their 1852 catalogue includes a Traversing camera for panoramic views and J Harrison Powell's stereo camera of 1858 was made by the firm. Horne and Thornthwaite also operated a commercial photographic studio at least into the mid-1860s.

Photography was only been part of the firm's wider scientific and optical instrument making and retailing business and on 1 July 1857 Messrs J [sic] Horne and Thornthwaite was granted a Royal warrant to Queen Victoria as opticians, philosophical and photographic instrument makers.

From the 1860s the firm's optical, philosophical and scientific instrument making appears to have gained in relative importance to its photographic interests. Horne and Thornthwaite continued in business until circa 1913.

All three of the partners were actively interested in photography:

William Henry Emilien Thornthwaite (1819–1894) was described as an optician and philosophical instrument maker. He joined the Photographic Society in 1870 and authored several manuals including *Photographic Manipulation* (1843) published by Edward Palmer and his *Guide to Photography* which went through many editions and was usually bound with the firm's catalogue. Thornthwaite acted as Secretary to a fund to pay for Martin Laroche's legal expenses after his successful court case with William Fox Talbot in 1854. Talbot had considered taking action against the firm and they testified against him at the trial of James Henderson in 1854–1856.

Fallon Horne (died October 1858) exhibited in the Society of Arts exhibition of 1852 under Horne & Co and produced a series of photographs of the Great Exhibition site being prepared. Horne was a strong proponent of this use of collodion and under the auspices of Peter Fry provided the main support to Frederick Scott Archer in bringing his collodion process into general use. Thomas Sutton described Horne as 'an exceedingly clever practical photographer in every branch of the art, but more particularly as a Calotypist.' He published 'On the Calotype Process' in *Humphrey's Journal* in 1856. He was in partnership with W H Thornthwaite and the Horne name continued to be used after his death.

Edward George Wood (1812–1896) manufactured scientific instruments in partnership with his brothers Henry and George and was described as a philosophical instrument maker in 1830 when he is known to have sold magic lanterns. Wood joined the existing partnership of Horne and Thornthwaite as manager of its optical works and his name was added to the firm's title. He was awarded a prize medal for photographic apparatus at the Great Exhibition. Wood established his own business at 117 Cheapside, London, in 1855 issuing his own catalogue of photographic apparatus and chemicals. Wood's main photographic interest was in magic lanterns, slides and projection equipment and he is credited with designing a biunial lantern while working at HTW. He remained in business until a few months before his death and his son A A Wood continued the business.

MICHAEL PRITCHARD

See also: Calotype and Talbotype; and Talbot, William Henry Fox.

HOUGHTON, GEORGE (1836–1961)
English photographic studio

The firm of George Houghton and Son had it's origins before photography was announced and continued as a photographic business until circa 1961. During its history the company absorbed or merged with a significant number of other British photographic businesses, including the lens makers Ross & Co, sensitised material makers Elliott and Sons, chemical producers Johnson and Sons as well as several smaller camera makers.

The origins of the firm date to 1834 when Antoine Claudet established a French glass warehouse at 87 High Holborn selling sheet glass, lamp shades and glass domes. In 1836 he was joined by George Houghton trading as Claudet and Houghton and from the early 1840s began supplying optical glass and photographic materials. Claudet concentrated his efforts on his photographic studio in Regent Street and seems to have had less to do with the glass business. Houghton's son, George, junior (1835–1913), joined the business in 1852 and the firm became Claudet, Houghton and Son. On Claudet's death in 1867 the business was renamed as George Houghton and Son and continued to expand with photographic goods playing an increasingly important role on the company. George junior's son Edgar (died 1950) joined in 1887 and with brother Charles the business was renamed 'and Sons' for a short time from 1892 by which time it was one of the leading general photographic retailers and manufacturers alongside Marion & Co and Fallowfield. The company offered a large range of cameras and accessories under its own name and trade names, principally 'Ensign' which it either made or had made for it and re-badged. It also retailed equipment and sensitised goods from other British manufacturers.

It became a limited company in 1902 and in 1904 Houghtons Ltd when it absorbed four significant photographic manufacturers. By 1908 their Walthamstow factory employed over 700 staff in a floor space of 71,300 square feet and 1000 employees in Great Britain. It was Britain's leading photographic manufacturer. George Houghton junior died in 1913 leaving a significant estate valued at £17,835 10s 9d.

In 1915 it formed British Photographic Industries Ltd with W Butcher and Sons Ltd and in 1926 the two firms merged completely maintaining a manufacturing dominance that was only matched by Kodak Ltd. A selling company Ensign Ltd was set up in 1930 which was absorbed by Johnson and Sons in 1941 when it's premises at 88 and 89 High Holborn took a direct bomb hit. The manufacturing side of the business continued, becoming Barnet-Ensign in 1945 with further mergers taking place until its demise circa 1961.

MICHAEL PRITCHARD

HOUSEWORTH, THOMAS (1828–1915)
American photographer

Thomas Houseworth, sailed from New York City with George S. Lawrence on April 4, 1849, intent on mining for gold in California. As fate would have it, they instead became among the best known early California photographers.

For two years, they worked the mines before settling in San Francisco, where Lawrence opened the first optical shop on the West Coast. Houseworth joined him in 1855.

In 1859, they began selling stereographs, working with local photographers to obtain images of San Francisco, California's boom towns, various mining operations and scenic sites. Soon, they offered the largest collection of stereo views on the West Coast, with more than 1,000 views of California alone.

When Lawrence retired in 1868, the firm became Thomas Houseworth & Company. Houseworth became embroiled in a public squabble with another local photographic firm, Bradley & Rulofson, after commissioning photographer Eadweard Muybridge to make a set of mammoth plate images of Yosemite, only to see his competitors publish them. The controversy left Houseworth in debt and damaged his reputation. His financial troubles mounted in the 1870s and he eventually was forced to turn to other vocations to make a living, such as optometry and accounting.

One of the Library of Congress's earliest photographic acquisitions, in 1867, was a set of more then 900 Lawrence & Houseworth half stereo prints.

BOB ZELLER

HOW, LOUISA ELIZABETH (1821–1893)
Australian amateur women photographer

Louisa Elizabeth How was born in England in 1821 and was married to James How (c. 1818–1868), a labourer from Melvern, Cambridgeshire with whom she had two sons. The How's emigrated to Port Philip, Australia in November 1849 perhaps encouraged by the financial success of a relative, Robert How (c. 1790s–1859). Robert How initially employed James in his thriving merchant and shipping company in Sydney and, by 1857, he had become a principal director of his own company. In line with their new status, the How family lived at 'Woodlands,' Kirribilli Point—a prime location on Sydney Harbour. It was whilst here that Louisa began to photograph, placing her salted paper photographs in a carefully constructed album that she titled and signed. The album (which is now owned by the National Gallery of Australia, Canberra) is significant as the earliest extant work by an Australian woman photographer. Louisa How's choice of subjects largely centred around

her home and she took many informally but artfully posed portraits of her husband and his male friends in a simply constructed 'studio' on her veranda. In 1866 the How's left their home following a downturn in business and little more is known of their lives. Louisa does not appear to have continued with photography and died in 1893 at the age of seventy-two.

ISOBEL CROMBIE

HOWLETT, ROBERT (1830–1858)

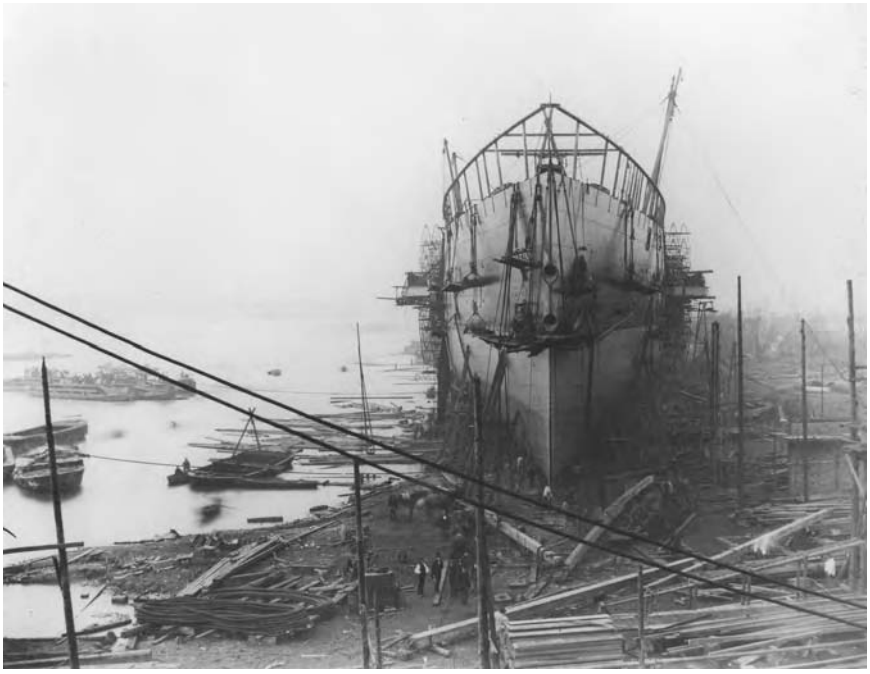
British photographer

Robert Howlett's tragically short life and brief career nevertheless yielded some of the most significant photographs of the 19th century. In particular, his image of *Isambard Kingdom Brunel and the Launching Chains of the Great Eastern* (1857) has become one of the icons of an era and is one of the first and finest examples of environmental portraiture. Despite the fame of his images however, Howlett's origins remain illusive. His father was a clergyman, Reverend Robert Howlett, of Longham, Norfolk. Nothing has been traced to date about his mother, education or early life.

Unlike many of the early gentleman-amateur photographers of his time Howlett is not recorded as having any other activity and can therefore be considered to be one of the first to have taken up photography as a profession exclusively from the start. It is known that he began making photographs in 1852 and very soon thereafter was employed at the Photographic Institution, 168 New Bond Street, London, a centre for the commercial promotion of photography, established in 1853 by Joseph Cundall and Phillip Delamotte. The Institution was active in exhibitions, publications and commissions and also housed a studio for portraiture. Howlett's name first appears in the photographic press in 1856. This and the following year were an incredibly busy and productive period in which he came into professional contact—no doubt through the well-connected Photographic Institution—with eminent artists, royalty and distinguished war heroes.

W.P. Frith commissioned Howlett to photograph crowd scenes from the roof of a cab at the 1856 Derby horse race at Epsom. The photographs were used by Frith in preparation for his painting *Derby Day* (1858). At the same period Howlett undertook the first of a number of commissions for Queen Victoria and Prince Albert that included copying the works of Raphael. Under Royal patronage he also made a series of portraits of soldiers of the Crimean War that were shown at the 1857 Photographic Society of London's annual exhibition under the title *Crimean Heroes*.

Howlett also contributed to the literature on photographic technique with, *On the various methods of printing photographic pictures upon paper with suggestions for their preservation* (London: S. Low, 1856). This publication addressed the fear at the time about the permanence of photographic prints, many of which had begun to show signs of fading. Howlett is known to have used W.H.F. Talbot's calotype process though most of his work was made using wet collodion on glass negatives printed on albumen paper. Alongside the commercial applications of the medium Howlett also produced landscape photographs such as *In the Valley of the Mole, Mickleham* and *Box Hill, Surrey,* 1855. These, among others, he submitted to the annual exhibitions



Howlett, Robert. The Bow of the *Great Eastern*.
The Metropolitan Museum of Art, Gilman Collection, Purchase, The Horace W. Goldsmith Foundation Gift, 2005 (2005.100.12) Image © The Metropolitan Museum of Art.

of photographic societies in London, Manchester and Norwich in 1856. At the Art Treasures Exhibition, Manchester, 1857, Howlett exhibited his portraits of W.P. Frith and other noted painters such as F.R. Pickersgill, J.C. Horsley and Thomas Webster along with examples of photographic copies of paintings. His architectural views of Rouen, France were exhibited posthumously at the Photographic Society of London in 1859.

Howlett's major work was to document the construction of the massive steamship *Leviathan*, later re-named *The Great Eastern.* At the time of its launching it was the largest ship in the world. It was constructed in London on the banks of the river Thames (at present day Millwall) and Howlett's photographs of the event date from November 1857. His images (along with some by Joseph Cundall) were translated into engravings for *The Illustrated Times* (16 January 1858, vol. 6, no. 146, 45–69) and thus achieved wide circulation. Some of the photographic prints were exhibited at the Photographic Society of London annual exhibition of 1858. He also produced stereographs of the ship with George Downs for the London Stereoscopic Company. Howlett's views of the gigantic hull surrounded by scaffolding in the shipyard, and of the deck peopled with foremen and labourers, reflected and stimulated the widespread interest in this feat of engineering. The best known of all his images is the portrait of the ship's creator and engineer, Isambard Kingdom Brunel (1806–59). Brunel's stovepipe hat, and the stacked heels of his boots, gives him height and presence. His formal clothes are dishevelled and muddied from the site while the cheroot he is smoking lends a jaunty air. The powerful backdrop is simply formed by the chains of the stern checking drum. As the ship was too large to be "free launched" these chains were essential in controlling the rate of slide down the ways to the water's edge where it was halted and left for the spring tide to lift it from its cradles. The portrait by Howlett represents the archetypal Victorian, driven by ambition and confidence, and celebrates the enterprise of an era.

Barely one year after this image was made, Howlett died at his residence in Bedford Place, Kensington, London, on 2 December 1858, aged twenty-eight. A combination of causes of death were reported ranging from a specific "attack of typhus fever which followed a severe cold caught by working in a new and damp operating room" (*Photographic Notes*, 15 December 1858, vol. III, 290) to a more general "excess of zeal … imprudence and overwork" (*Journal of the Photographic Society*, 21 December 1858, 112). However, Mr. Hardwich, the correspondent to the *Journal of the Photographic Society*, continued in his *Remarks on the Death of Mr. Howlett*, with his own speculations about the cause of death: "Collodion photography, in the way that an amateur would practise it, is quite harmless; but the professional operator must be upon his guard; for, unless he is a very strong man, he will certainly suffer in the end by continually shutting himself up in small rooms half full of the vapour of ether." Howlett's early death clearly did not help to allay fears among the growing ranks of professional photographers that working with the noxious chemicals then required for their work could be severely harmful to their health.

Martin Barnes

Biography

Robert Howlett was born in 1830, the son of a clergyman, Reverend Robert Howlett, of Longham, Norfolk. Nothing has been traced about his mother, education or early life. Howlett is not recorded as having any other activity and can therefore be considered to be one of the first to have taken up photography as a profession exclusively from the start. He began making photographs in 1852 and soon thereafter was employed at the Photographic Institution, London. Throughout 1856 and 1857 he was extremely active taking photographs for the artist W.P. Frith, working under royal patronage to photograph works by Raphael and to make a series of portraits of Crimean War heroes, and publishing a book on the printing and preservation of photographs. He made portraits and reproductions of works of art as well as landscape photographs which he showed at the annual exhibitions of photographic societies in London, Manchester and Norwich. Howlett's major work was to document the construction of the steamship *Leviathan*, later re-named *The Great Eastern.* His images were translated into engravings for *The Illustrated Times* in 1858. In particular, his image of *Isambard Kingdom Brunel and the Launching Chains of the Great Eastern* (1857) has become one of the icons of an era and is one of the first and finest examples of environmental portraiture. Howlett died in London, on 2 December 1858, aged twenty-eight. His early death was perhaps hastened by overwork and prolonged exposure to noxious photographic chemicals.

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International Museum of Photography, George Eastman House, USA.
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See also: Victoria, Queen and Albert, Prince Consort; Talbot, William Henry Fox; and London Stereoscopic Company.

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HUEBL, ARTHUR FREIHERR VON (1853–1932)

Photographer and inventor

Arthur Freiherr von (Baron of) Huebl was born on Mar. 20, 1853, in Grosswardein (Nagyvárad, today Oradea, Romania), received higher military training between 1877 and 1879, and studied chemistry in Vienna from 1879 to 1882, finishing with a doctorate. From 1884 to 1918, he worked at the Institute of Military Geography at Vienna, from 1916 to 1918 as its commander general. Starting with a joint publication on the platinotype with Giuseppe Pizzighelli in 1882, Huebl produced a long line of technical books and articles on many subjects in photography, ranging from reproduction techniques over printing methods to his most prominent field, colour photography. His book on theory and practice of colour photography, first published in 1908, saw six issues until 1933 remaining the most comprehensive volume in the field up to this time.

In 1887, A.v.H. helped to found the first Club of Amateur Photographers in Vienna which was the nucleus of the fine art photography movement in Austria. In 1894, Huebl developed a panoramic camera, in 1898 he invented a photographic theodolite. From 1920 to 1924, Huebl installed and presided the Institute of Military Geography in Rio de Janeiro; after his return to Vienna he had his own laboratory at the Cartographic Institute. Arthur von Huebl died in Vienna on April 7, 1932.

ROLF SACHSSE

HUGHES, CORNELIUS JABEZ (1819–1884)

British photographer, writer, and lecturer

As a young man, Hughes developed an interest in debating societies and similar associations. As a lecturer and teacher on memory ("phrenology and subjects cognate thereto" according to the *Photographic Times and American Photographer*) he met John Jabez Edwin Mayall, then working in the Strand as a daguerreotypist, whose secretary he became. In 1849, Hughes established himself as a daguerreotypist in Glasgow. In 1855 he returned to London as a photographer in the Strand, but as this venture not successful, in 1859 he opened a warehouse in Oxford Street. Being a dealer proved uncongenial, so he sought a new opening as a photographer. This presented itself towards the end of 1861, when the Ryde photographer W.G. Lacy died in his Oxford Street sitting room, and Hughes subsequently purchased that business, being succeeded in London by his friend and previous manager, John Werge. He rebuilt the studio and reception rooms in the Arcade at Ryde, later transferring to the purpose-built Regina House in Union Street nearby. His proximity to Osborne and high-class productions secured the patronage of the Queen, for whom he executed a large amount of work. Ever an innovator, he adopted the carbon process to the almost entire exclusion of silver printing.

The death of his only son, who had assisted in Ryde, was a great blow. Alfred Wright Hughes (married with three children) died in London on 1 February 1878. This was reported in two Ryde newspapers and attributed to apoplexy, but that was not the whole story. A death certificate reveals he had died in St. James's Park, the cause being "Prussic acid. Suicide when insane a few minutes." An inquest was held before the Westminster coroner, though this was not reported in the London press, and went unnoticed in the photographic journals. However, documents concerning the inquest, at which both Jabez Hughes and John Werge gave evidence, are preserved in Westminster Abbey. Although Werge knew all about Alfred's suicide, it is never mentioned in his book *The Evolution of Photography*, neither does it feature in any Hughes obituary, so was certainly not common knowledge at the time.

Jabez Hughes never abandoned London, retaining his connection with various photographic societies. He was elected a member of the Photographic Society of London in 1858. He served on the committee of the North London Photographic Association, was also a vice-president of the South London Photographic Society, and, though not an officer of the Photographic Club, presided at its inaugural meeting. He was, in addition, one of the oldest members of the Solar Club.

An obituary in Ryde's *Isle of Wight Observer* noted that as a townsman Hughes was much liked and universally respected, though he refused to have anything to do with local politics. He was a prominent member of the Philosophical Society, and frequently lectured upon scientific topics with a fluency and ease which showed how deeply he had studied and how greatly he delighted in such researches. He also presided over the Ryde Literary Society for several years. Hughes frequently attended social gatherings, and had a turn for verse making, occasionally delighting friends with a topical song to some well-known tune.

In the 1860s he played an important part in raising and administering a fund to support John Frederick Goddard. When the latter's reduced circumstances were brought to his attention, Hughes with characteristic energy and generosity at once proposed a general appeal, issuing upwards of two thousand circulars, and many hundreds of personally written letters to photographers

all over the world, in addition to articles printed in the photographic press.

The *British Journal of Photography* noted that the chief work by which Hughes would be remembered was his photographic manual. This is listed in Gernsheim's *Incunabula of British Photographic Literature*, where there is some confusion over titles and editions. English editions of this work were published as *The Principles and Practice of Photography Familiarly Explained*, by Jabez Hughes, the first dating from 1861. At the same time, a virtually identical book appeared (probably only in the USA) under the title *How to Learn Photography*, by Jabez Hughes and John Werge. Trifling differences suggest that the latter was printed first, allowing time for copies to reach America before the English edition came out. At the time of publication, John Werge was in the USA—he had visited America before, and was possibly better known over there. Also, the less highfalutin title, *How to Learn Photography*, might have been deemed more appropriate for the American market. The latter seems never to have gone beyond its first edition; whereas *The Principles and Practice of Photography Familiarly Explained* was into a second edition within a few months, and had reached a 14th by 1887, those from the 12th (1880) onwards being edited by J. Werge.

Nuggets of practical advice lie buried in this popular manual. Two chosen from the 9th edition (1870): "Double or treble the exposure in the camera is required during an easterly wind ... Avoid the use of wide-angle lenses when the ordinary ones will do. They are dangerous tools to use." Some recommendations from the 10th edition (1873): "Never be contented with a medium quality of picture if you can obtain a better one; 'I dare say it will do!' will not do at all in good photography ... Never attempt landscapes on windy or misty days ... Wash your plates well; wash your negatives well; wash your prints well; and wash yourself well ... Ventilation is the soul of health. Ventilate your dark room; ventilate your bath, your camera, your tent, and your ideas."

RAYMOND TURLEY

Biography

Cornelius Jabez Hughes, known simply as Jabez Hughes, is presumably "Cornelous Hughs son of David & Elizebth Hughs" born on 20 July in the parish of St. James's, Westminster, and entered in the baptismal register of Hinde Street Wesleyan Chapel, Manchester Square, on 24 October 1819. Curiously enough, he was baptised for a second time on 17 January 1827, at the church of St. James, Westminster. The register records Cornelius Jabez (born on July 20, 1819), child of David Hughes (taylor) and Elizabeth, who lived in Heddon Street, off Regent Street. He married on 19 June 1843, at the parish church of St. Paul, Covent Garden. The bachelor groom was described as a tailor, living in Maiden Lane, the son of David Hughes, tailor. His bride Esther Wright, a spinster also residing in Maiden Lane, was the daughter of Edward Wright, gentleman. Their son Alfred was born on 1 October 1843, the father's occupation still being given as tailor. Jabez Hughes died at Ryde on 11 August 1884. He was buried in London's Abney Park cemetery, near his only son. He had made a will in June of that year, his personal estate being valued at £9402 18s. 5d. An obituary in the *British Journal of Photography* provides many useful details of his career.

See also: Mayall, John Jabez Edwin; Werge, John; and Goddard, John Frederick.

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HUGO, CHARLES (1826–1871) AND FRANÇOIS-VICTOR (1828–1873)

French photographers and writers

Charles (1826–1871) and François-Victor (1828–1873) were the sons of Adèle Foucher Hugo and Victor Hugo, the French poet and politician. Raised in Parisian cultural and political circles, they soon became involved in journalism. In 1851, for political reasons, they were prosecuted and sentenced to jail. On the 2nd of December 1851, Napoleon's coup capsized the Republic. As a republican deputy to the *Assemblée Nationale*, and opponent to the new regime, Victor Hugo secretly fled to Brussels. But his libel *"Napoleon le petit"* made him *persona non grata* in Belgium, and he was forced to leave once again. On the 5th of August 1852, Victor Hugo, along with his son Charles, his wife and his daughter, both named Adele , and their friend Auguste Vacquerie, took shelter in Jersey Island, a common lo-

cation for French exiles. François-Victor was to come a few months later. The family stayed at Marine Terrace until their final relocationto Guernsey on October 31 1855. The poet lived on this Island close to Jersey until the French empire collapsed and the Republic was proclaimed on September 4th, 1870.

While this upper middle class family had led a busy social life in Paris and Brussels, in Jersey, they had to adapt to a new pace, which largely contrasted with their former life. They had to get along with new kind of distractions. So, plans for a book illustrated with photography shaped up as soon as November 1852: *Jersey et l'Archipel de la Manche*. Made up of two volumes, one rather inexpensive, would have contained the poet's 400 verses, and a more luxurious one with text (pertaining to Jersey's history and institutions) would have been illustrated with the photographs taken by his sons Charles and François-Victor, and Auguste Vacquerie.

The Hugos pictures have to be understood within the context of exile and the framework of this project. This publication, and the photographs as well were aiming to distract the Hugo family. For their father Victor Hugo, it could have served to solve some financial problems. The project was also conceived of a common work between the writer and his sons and friend, and an opportunity to have them busy experimenting with a new medium for which V. Hugo was enthusiastic (photography). For Victor Hugo, taking advantage of his interest in Jersey's nature and history and avoiding any political references, such a book of photography let the French public know that not far away from the French shore, was a small group of opponents to the imperial regime.

In 1853 Jean-Jacques Sabatier, another French exile, apparently taught the Hugo sons daguerreotype, and the very basics about photography using negatives. Though François-Victor apparently kept on using this technique, Charles came back to Caen (France) in March–April 1853, where he learnt the use of glass negative, (collodion and albumen plates), and large size cameras, under a friend of his father, the photograph Edmond Bacot. Compared to François-Victor's daguerreotype, Charles gained the possibility of printing several images from a sole negative, mainly using a salted paper technique which gave softness and a result that resembled a drawing, especially with portraits.

Victor Hugo, though he never was the operator during the photographic sessions, acted as a director during the shootings. The Hugos sons' images, particularly in the case of landscapes, show a close attention to scenery, dramatic grandeur, sublime, strangeness, and above all an incredible admiration for their father. Their photographic images of him emphasized his daring attitude as an exiled republican and militant writer. Through those images, Victor Hugo was eager to attest differently his political commitment by spreading his image widely as a message from the determined handful of men standing up against the regime.

Illustration books presenting picturesque or romantic travels belonged to a well-established tradition in the eighteen fifties. Victor Hugo had been earlier included in a project of an illustrated book on Rhine and *Mont Blanc*. And in this same year 1852, Blanquart-Evrard published "*Voyage en Egypte, Nubie et Palestine*" with Maxime Du Camp's photographs. Yet this project which mingled poems and prose with photographs remained unfinished for several reasons: first, Hetzel, Hugo's usual publisher, proved to be very cautious, fearing the high costs for such a publication. Then the censurship organized by the imperial regime threatened the press; the reviews refused to be partners of the project, even though it were publicized in "*La Lumière*" the Parisian journal specialized in photography (August 6 1853, no. 32, and October 8 1853, no. 41). The pictures made in Jersey were to be circulated separately as single images or albums to be given to close friends. For the texts already written, Auguste Vacquerie was to use part of them in *Profils et Grimaces* (1856), *Les Miettes de l'histoire* (1863), and Victor Hugo would publish his poems in *Les Contemplations* (1855). François-Victor published his texts in *La Normandie inconnue* (1857), while his brother never undertook the part he was supposed to write.

All hopes for publication apparently were dropped by 1856. At that time, the Hugos had moved to Hauteville House in Guernsey, and even if a dark room had been organized there, only four new photographs seemed to have been taken in this island (though some reprints from the Jersey negatives seemed to have been done somewhat later on). With the end of this illustrated book project came little by little for the Hugos sons a fading interest in photography, even though Charles seemed to have perfected his technique in1860, when photographers Leballeur and Auzou stayed with the family. The brothers turned to other activities, such as writing plays or translating Shakespeare in French. The exile was getting tiresome and their sojourns abroad, without their father, longer.

MATHILDE LEDUC-GRIMALDI

Biography

Charles (1826–1871) and François-Victor (1828–1873) were respectively Victor Hugo's second and third children of four, and his only two sons. Both of them were very deeply influenced by their father (1802–1885), his work and interests, artistic as well as political.

In 1848, Charles, after a short term as Lamartine's personal secretary, started a newspaper *l'Evènement*, along with his brother François-Victor, and two close friends, Paul Meurice and Auguste Vacquerie. They all

were prosecuted in 1851 on political grounds. After having been jailed at the Conciergerie, they left France, to meet their father who having been banished by Napoleon the Third, had fled secretly to Brussels. Thence, the road of exile took them to Jersey (1852–1855) and Guernsey after 1855.

During their exile, at least until 1855, the Hugos brothers' main interest was photography. Most of the pictures are kept in Bibliothèque Nationale de France, Maison de Victor Hugo, Musée d'Orsay, (Paris, France), and partly in Musée de Victor Hugo (Villequier, France).

Later, they undertook literary activities. Charles wrote novels (*Le Cochon de Saint-Antoine*, in 1856, *La Bohême dorée* in 1859, in 1860, *La Famille tragique*), plays (*Je vous aime* in 1861), or travel writing (such as *La Liberté*, a journey with his father in 1867). François-Victor, starting with the translation of the Shakespearean Sonnets (1857) and Marlowe's *Doctor Faustus* (1858), devoted himself to the entire work written by Shakespeare from 1859 to 1866.

Charles settled in Brussels in 1861; François-Victor joined him with their mother Adèle, after his fiancée died in Guernsey in 1865. In 1869, the Hugos brothers founded along with Vacquerie, Meurice and Rochefort a new political publication, called *Le Rappel*, clearly fighting the imperial regime and its censorship. As a result, the brothers were fined and sentenced to jail several times. Charles married Alice Lehaene (1865) in Brussels, and fathered the two beloved Victor Hugo's grandchildren, Georges (1868) and Jeanne (1869). He died in Bordeaux, a few months after the collapse of the empire and the proclamation of the French Republic. François-Victor died two years later, in Paris.

See also: Bacot, Edmond ; Daguerreotype; Wet Collodion Negative; Albumen Print; Salted Paper Print; and Vacquerie, Auguste.

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HUMBERT DE MOLARD, BARON LOUIS-ADOLPHE (1800–1874)

Photographer

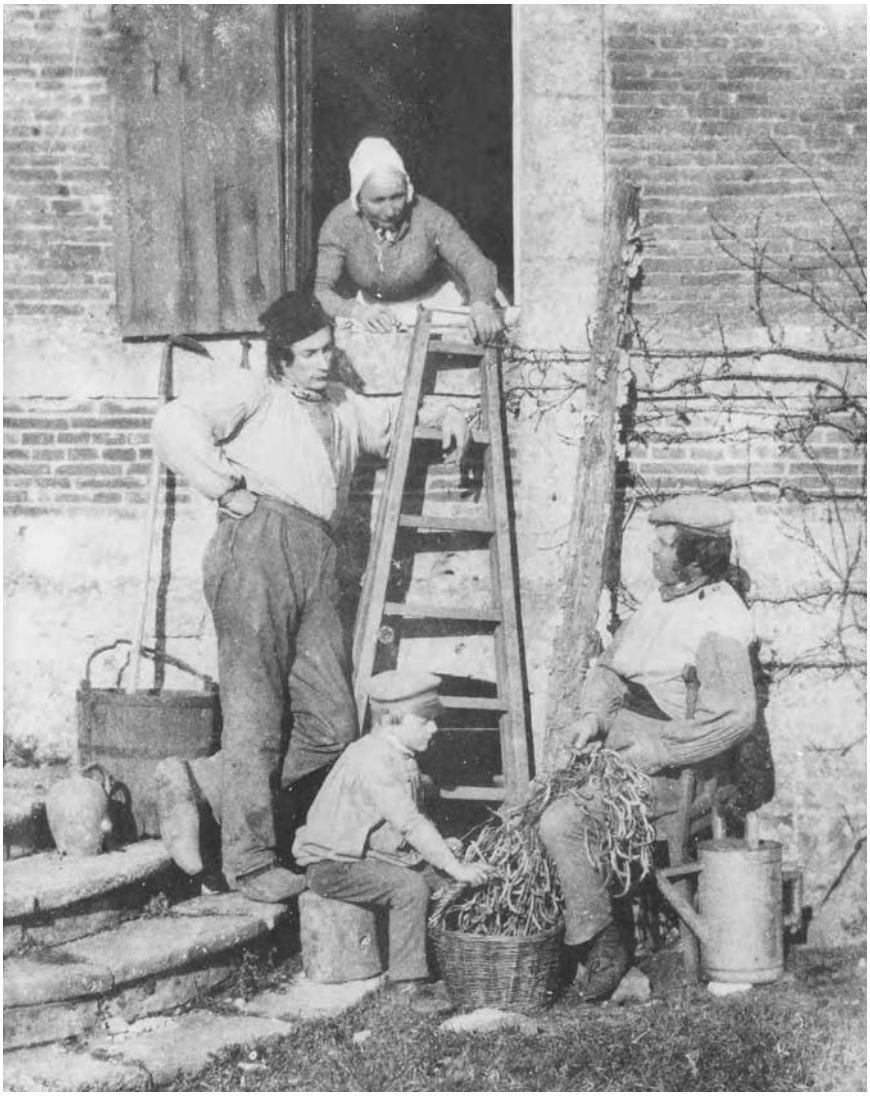
Humbert de Molard was born on 30 October 1800 in Paris, to a family originating from the Calvados region of lower Normandy. His father, Jean-Claude-François Humbert, was a career officer in army who became a baron in 1809, adopting the particle "de Molard" late in life. Very little is known about his mother, Marie-Louise Luce Justine Robillard. Although his parents lived their final days at the *château d'Argentelle*, near Manerbe, it seems that Humbert de Molard's childhood was spent in the environs of Paris.

Few things are known about the first thirty years of Humbert de Molard's life. It appears that he studied law for a time, but it is not known if he finished this course of study or not. He was reputed to be quite a prestidigitator in Parisian circles, impressing people with his command of sleight-of-hand tricks—and perhaps forming a useful background for later photographic practices. He also appears to have been a skilled wood-worker.

In his youth, Humbert de Molard worked for his uncle, Louis-Marc-Antoine Robillard d'Argentelle, a former naval officer who had created a collection colored wax reproductions of tropical plants. Humbert de Molard was charged with maintaining and restoring the wax reproductions, which were exhibited at his uncle's house in what came to be known as the "carporamic museum." Upon his uncle's death in 1828, Humbert de Molard took charge of the collection, giving guided tours to visitors and eventually reestablishing it at his Parisian apartment in 1833. Much later, in 1853, he sold the collection to the Parisian *Muséum d'Histoire Naturelle* [Museum of Natural History], located at the *Jardin des Plantes* [Botanical Gardens].

In 1832, Humbert de Molard married Constance-Clara Saint-Jean de Montfranc. The couple had two children, Louise Marie Julie Humbert de Molard, born in 1832, and Gabriel Charles Claude Adolphe Humbert de Molard, born in 1834, both of whom he would later photograph.

His wife having died in 1841, in 1843, Humbert de Molard married Henriette Renée Patu, a talented miniaturist, lithographer, and landowner from Lagny, in the fertile Aube region east of Paris. He and his children relocated to Lagny, where as a landowner affiliated with his wife's family, he became quite wealthy. His second marriage also coincided with his taking up photography, which was to become a consuming passion for



Humbert de Molard, Baron Louis-Adolphe. Stringing Beans. *The Metropolitan Museum of Art, Gilman Collection, Purchase, Mr. and Mrs. Henry R. Kravis Gift, 2005 (2005.100.263) Image © The Metropolitan Musem of Art.*

the remainder of his life. Here he appears to have been influenced by his friend Hippolyte Bayard, who may have given him his first lessons in photography.

At first, Humbert de Molard practiced the daguerreotype process to a point where he became quite proficient at it. Then, around 1844, he took up the calotype or paper negative process, practicing the two procedures concurrently at first, but eventually becoming more interested in the calotype. He also experimented with the albumen negative process in the late 1840s and the wet-collodion process in the 1850s.

Most of Humbert de Molard's photographs which survive to this day are daguerreotypes and calotypes made during the period 1845–1849. These are either landscapes made in the environs of Lagny or Margne, or photographs of his family, friends, and acquaintances. The landscapes tend to feature sparing, open views of rustic architectural elements, in a similar vein to his contemporary Henri Le Secq. Over and above these, however, he excelled at staged portraits, using props and costumes to artificially recreate an atmosphere of daily life at Lagny, the candid gestures and expressions of his subjects revealing a sense of immediacy that is rare for the period. Many of these being calotypes, they show a concern for detail that is most unusual, as for example, a depiction of a woman seated with ring of playing cards placed upon her lap, or a family portrait, where the text of a sign posted on the wall is also legible. Many of these recall Bayard's self-portraits and anticipate the *tableau vivant* style of Vallou de Villeneuve, with whom Humbert de Molard also seems to have been acquainted.

Throughout his photographic career, Humbert de Molard was very interested in chemical experimentation. Dissatisfied with the way that hypo bleached salt prints, in 1844–1847, he arrived at an alternative fixing bath which avoided the use of hypo entirely. After exposure in a printing frame, the print was rinsed in an ammonia solution. This was followed by a gold chloride toning bath. Once the desired tone was achieved, the print was fixed in a solution containing potassium cyanide and

iodide, then washed. Some of his prints made using this process still survive today and are in very good state, characterized by a reddish-sepia tonality.

Following the work of Claude Félix Abel Niépce de Saint-Victor, Humbert de Molard experimented with albumen on glass in 1848. In 1850, working with Niépce de Saint-Victor, he arrived at an alternative procedure which reduced the exposure time by one-third; however, Humbert de Molard remained unsatisfied with the albumen process's lack of rapidity, as well as the difficulties inherent in obtaining a even coating of albumen.

In 1851, with the help of a chemist named Aubrée, Humbert de Molard published a technique for making paper negatives capable of much shorter exposure times, using ammonium acetate as an accelerator in the developing bath.

In 1854, Humbert de Molard became a founder-member of the Société française de photographie [French Society of Photography]. Through the publication of the society's bulletin, he offered technical advice and comments upon photography's historical interpretation. Concerning technical matters, he suggested a way to render paper negatives translucent using turpentine, advanced an early bellows-style camera design, and made improvements to stereoscopic photography. With regard to the historical interpretation of photography, in 1855, he insisted that French paper negative photography came into full flower in 1847 with the publication of Guillot-Saguez's paper negative procedure, which he viewed as the real break with Talbot's primitive calotype technique, rather than Blanquart-Évrard's more celebrated procedure. Similarly, in 1860, he defended the primacy of Gustave Le Gray's wet-collodion procedure over Scott Archer's, dreading the day when French innovation in the field of making glass negatives should be included under the heading, "archerotypes."

In 1864, Humbert de Molard resigned from the administrative council of the Société française de photography, citing reasons of ill health. He died on 17 March 1874, and was buried in Manerbe.

Alan Greene

Biography

Baron Louis-Adolphe Humbert de Molard was born on 30 October 1800 in Paris. As a young man, he assisted his uncle in the retouching of wax reproductions of tropical flora. From 1843-1849, he practiced both the daguerreotype and calotype with proficiency, making landscapes and portraits. In particular, his portraits were characterized by a theatrical quality in which he was able to obtain relatively candid expressions and poses from his models. Humbert de Molard was also interested in chemistry and introduced a number of innovations to the calotype process, including fixing without the use of hypo and adding a mild alkali to the developing solution in order to accelerate development. In 1854, he was a founding member of the *Société française de photographie*, which counted among its members several other notable French photographers from the period. Humbert de Molard died on 17 March 1874 and was buried in Manerbe, France.

See also: Bayard, Hippolyte; Calotype and Talbotype; Daguerreotype; and Le Gray, Gustave.

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HUMOUR

With amazing speed, photography reached the four corners of the world, and began to make its presence felt in every branch of human endeavour. It recorded the milestones of private life, from birth to burial. It celebrated, or satirized, great figures on the public stage. It could be used to report a war, to further research, to launch a business or to advertize a product. Something of this range and versatility was foreseen in the first notable cartoon about photography, "La Daguerréotypomanie," by Théodore Maurisset, which appeared in December 1839.

Although the photographer soon became a familiar figure in the social landscape, the photographic process itself remained a puzzle. The baffling mystery of how, from a wooden box, a black cloth, a collection of chemicals and one man with a stop-watch, an uncannily lifelike image could be produced formed the subject of several early cartoons, like one by Gérard Fontallard, published in 1842. The travails of the amateur enthusiast, loaded with equipment, lashed by rain, scorched by sun and mocked by self-appointed critics at every turn , was

another favourite theme on which many variations were played, by such artists as Cuthbert Bede (1855).

The most fruitful source of humour, though, was found in the studio world of the professional portrait photographer. Self-delusion is the stuff of comedy, and the pretensions of photographers and clients alike offered tempting targets. Lip-service was invariably paid by both parties at the altar of truth. The photographer's proud claim was that the camera could not lie. The client's firm demand was for a faithful likeness. Unvarnished truth, however, proved very hard to live with. What everybody really wanted was an idealized portrait, and photographers were more than happy to oblige. The magic art of retouching was used to bring out the best and blot out the worst in the client's appearance, while paper flowers, cardboard trees and ballroom backdrops added glamour and dignity to the dingiest provincial studio. Through this gap between rhetoric and reality there ran a vein of comedy, ready to be tapped by countless happy miners.

Soon after it had arrived on the scene, photography became a stock theme for cartoonists, both sophisticated and crude, from Daumier, Nadar, and Cuthbert Bede in the 1840s–1860s, to W.S.Gilbert and Linley Sambourne in the 1890s. Their work was carried by such popular illustrated journals as *Punch* and its many imitators, which flourished all over the world in the same sixty-year period. Cartoonists, always in search of fresh copy, seized their chance whenever photography was in the news, whether as hero or as villain. There were jokes about the camera helping the police to catch wily criminals, and jokes about the camera helping its master to catch unwary customers with "spirit" photographs. Even certain technical developments in photography itself proved to be promising material. The invention of the x-ray photograph in 1896 prompted some uneasy laughter in the months which followed the announcement.

The comic aspects of photography were explored not only in cartoons but in essays, stories and light verse. Edward Bradley, under his pen-name "Cuthbert Bede," wrote the first, mildly funny book about photography in English, *Photographic Pleasures*, which was published in January 1855. This was illustrated with his own cartoons, some of which had already appeared in *Punch* during the two previous years. Lewis Carroll, in "Hiawatha's Photographing" (1857) and "A Photographer's Day Out" (1860), produced charming accounts, in both verse and prose, of the amateur's frustrations in the making of a family group portrait and of an artistic landscape view. Frederick Locker , in his witty verses on "Our Photographs" (1872), described the part played by a photograph in an ill-fated courtship. Jerome K. Jerome, in *Three Men in a Boat* (1889), had fun with the problems of photographing a friend while at the same time trying to steer a boat on a crowded river Thames. For his *Utopia, Limited* (1893), W.S. Gilbert composed a song, a deft variation on the Kodak slogan of the day, "You Press the Button, We Do the Rest."

The photographer was usually the butt of all the jokes, but sometimes the tables were turned and he became the creator of the comedy. In the fantasy world of the studio he could make his own stage-sets and direct his own dramas. At the turn of the century, in the 1890s and the early 1900s, whether as forerunners or imitators of the fledgling movie industry, sets of cabinet cards were issued by many photographic companies. These cards, when arranged in the right order, told farcical tales of office romance and domestic discord, or showed that threat to family tranquillity, a gigantic stork, delivering one bundle of joy after another to a doomed, forever housebound father. Optical distortions, frowned on as flaws in serious photography, came into their own in farce. Gigantic feet, or beards, or noses, on puny little bodies, guaranteed an easy laugh or two on many a comic card.

In the darkroom it was possible to mix and match photographs and sketches, to re-assemble the heads and bodies of different figures into strange new hybrid creatures. This method, of combining a realistic, identifiable portrait head with a fantastic, unlikely body, was often used just for fun, to amuse holiday-makers at the seaside or at country fairs, but it could be employed, with deadly effect, in political satire. A *carte-de-visite*, issued in 1865 at the end of the American Civil War, deflates the pretensions of the defeated Confederate commander, Jefferson Davis. His photographed, instantly recognizable head has been set on the sketched body of a woman, and he attempts to escape in the humiliating disguise of skirt and shawl. Composite cartoons of this kind, concocted by a Government sponsored photographer, Eugène Appert, were circulated to demean and ridicule the leaders of the Paris Commune, after that uprising had been crushed in 1871.

Photography and society soon became inextricably entwined, and humour helped to ease the tension of that tight embrace. In cartoons and commentaries, images and captions, the two were made to mock each other and to laugh at themselves.

Bridget Ann Henisch

See also: Bede, Cuthbert; Nadar (Gaspard-Félix Tournachon); Dodgson, Charles Lutwidge; and Cartes-de-Visite.

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HUMPHREY, SAMUEL DWIGHT (1823–1883)

When the first issue of *The Daguerrean Journal* appeared on November 1st 1850, American photographers experienced their first specialist journal devoted to the new art, and the world welcomed the first commercially produced photographic magazine.

The editor and publisher was Samuel Dwight Humphrey, born in Hartland Connecticut, himself a daguerreotypist in New York with several years experience, and already by that time, co-author with M. Finley of the 1849 manual on the process, *A System of Photography Containing an Explicit Detail of the Whole Process of Daguerreotype*. For the third edition of that book, 1851, Humphrey became publisher as well as co-author. His other two major books were both self-published—*An American Handbook of the Daguerreotype* (1853) and *A Practical Manual of the Collodion Process* (1856). Both ran to several editions throughout the 1850s.

After two years of successful publication, *The Daguerrean Journal* name was changed to *Humphrey's Journal of the Daguerreotype and Photographic Arts*—usually referred to as *Humphrey's Journal*—a title it retained until 1864.

Throughout his editorship, Humphrey continued to operate a portrait studio in New York. He became a founding member of the New York Heliographic Association in 1851, possibly the first professional photographic union in the world—which later became the American Daguerre Association—and remained an enthusiastic supporter of maintaining fair prices and high quality. A prolific photographer, in 1853, boasted that he had made sixty-one successful daguerreotypes in one day.

Renamed *Humphrey's Journal of Photography* in 1864 Humphrey's magazine continued to enjoy success under the editorship of John Towler.

JOHN HANNAVY

HUNGARY

Throughout Hungarian newspapers were reports on Louis Jacques Mandé Daguerre's invention, the daguerreotype, scarcely but a few weeks after physician and astronomer, Francois Dominique Arago's announcement of it at the French Academy of Sciences.

As early as 2 February 1839 the newspaper "Hasznos Mulatságok" published an article on Daguerre's invention, which "by light and rays reflects a most accurate image of objects and preserves the image true to life." The same newspaper in its September 4-issue revealed the "secret of Daguerreian painting"; that is, based on Arago's August 19-speech, a paitning which provided a detailed and clear description of daguerreotype like production.

In 1839 count Antal Apponyi, the ambassador of Austria-Hungary to Paris was given a daguerreotype by Daguerre himself. This photo is currently in the collection of Országos Müszaki Múzeum (Hungarian Technical Museum) and unfortunately, the picture can be seen only in reproduction.

University teacher József Petzvál constructed a high sensitivity object-glass in 1840 with which he largely contributed to the decrease of exposure-time. The Viennese company Voigtländer manufactured a camera for this lens.

In May 1840 the description of Daguerre's method of "creating images" was published, translaed by Jakab Zimmermann.

The ambitious people in Hungary were producing daguerreotypes that same year, such as Antal Vállas, an arithmetic teacher at the university of Pest, who in August 1840 presented two of his earlier photographs at a meeting of the Hungarian Society of Siences. He later took two daguerreotypes on the spot of the Danube's bank and of the castle of Buda. Like many of the photographs from the early period of photography these daguerreotypes have not survived, and were only mentioned in newspapers. In June 1841, the first photographic studio opened in Pest. It belonged to Jakab Marastoni, who was a painter and daguerreian artist of Italian origin. According to our current udnerstanding, it was he who took the only photograph of Lajos Kossuth, the outstanding politician of Hungary's 19th century, during the period when Kossuth was still in Hungary before being politically exiled. The plate still exists but the picture has completely deteriorated and only a reproduction from the 1930s resembles its former state. In 2002 the Historic Photographic Collection of the Hungarian National Museum managed to purchase a daguerreotype which had been photographed by Jakab Marastoni in 1842. The daguerreotype, depicting a neatly-positioned biedermeier group of eight people, was in good condition. Being the earlier works of one of the first masters of Hungarian photography, it represents an extraordinary value.

After Marastoni a number of Hungarian daguerreotype-photographers started to run their own businesses from 1842 onwards. The first ones in Pest were located in the cultural centre of the country.Amongst other were Ferenc Tarsch and (N) Khogler (1842), about whom we know only from newspapers. Lipót Strelisky, immigrated from Galicia, and opened his

studio in 1843, and Lajos Kawalky who had come from Danzig in 1838 set up a studio in 1844. József Heller, opened his studio in 1847 while Ádám Gola, a former arificial flower maker, established his studio in 1845 in Buda, and Lajos Mezey—having finished his training in Pest—started his own business 1845 in Nagyvárad (Oradea, Rumania). Unfortunately the locations and circumstances of Móric Zsák's work are unknown, and only two of his daguerreotypes have survived, which can be found at Magyar Fotográfiai Múzeum (Hungarian Museum of Photography). Strelisky and Kawalky were originally goldsmiths by profession. Though Strelisky took daguerreotypes of many leaders of the Hungarian Revolution and War of Independence (1848–49), his photos became lost, and only drawn copies are known from later newspapers. What survived of him was a daguerreotype-copy of a lithograph showing the opening ceremony of the revolutionary general assembly of June 1848. A stereo daguerreotype of Lipót Strelisky's also survived, together with the diffusing-viewer built in its case. Lajos Mezey, who changed from painting to photography took excellent shots of his wife and of himself with his daughter in 1852. A photographer in Buda, Ádám Gola recorded, in 18 daguerreotypes, the statue models of István Ferenczy in the courtyard of the sculptor's studio, before they were destroyed by a desperate and bored sculptor who lacked orders.

Photohistorians had long been puzzled by the identity of the author of the daguerreotype-portrait depicting Sándor Petöfi, one of the most outstanding poets of Hungarian literature. The latest research attributes the shot to actor and amateur photographer Gábor Egressy. The daguerreotype, which can now be found in Petöfi Irodalmi Múzeum (Petöfi Museum of Literature), has deteriorated significantly over the past 150 years but fortunately a reproduction of very good quality was taken 30 years after the poet's death (in 1879). This photo by György Klösz still reflects the poet's true to form traits.

Commonly regarding the Transylvanian region, it can be stated that in the first years that characteristically landlords, and venturesome amateurs pursued photography. Additionally they made photographic experiments. Such people were Senior Miklós Zeyk, Elek Buda, count Zsigmond Kornis, baron Károly Apor and count Imre Mikó. The appearance of professional studio photographers occured later than with the middle or western part of the country.

In the second half of the 1840s more photographers were producing talbotypes. Alajos Kramolin used this method in 1847 to take a photograph of Ernö Kiss, a general of the Hungarian War of Independence who was executed among others in 1849. Antal Kramolin, a relative of Alajos Kramolin took a shot of landlord Vince Perczel, a photograph which attested a good portrayal. Lajos Kawalky produced coloured talbotypes of the famous goldsmith József Szentpétery. Amazingly, a number of heavily retouched photographs by Kawalky copied onto chloride paper still existence today. Also notable, 249 talbotype-positives and 3 talbotype-negatives have been preserved from József Skopáll's studio opened in 1848 in Györ, these photos show the portraits of the town's inhabitants and include some shots of townscapes as well.

Ferenc Veress' talbotype-negatives, one of which depicts the photographer himself, experimented with various techniques of photography. János Tiedge left Mihály Vörösmarty's portrait to posterity (one of the most famous poets of the century) and several prints of these superbly-produced talbotypes have survived.

Károly Pap Szathmári, born in Transylvania, carried out his renowned life's work in the Principality of Rumania; his outstanding acheivement was that he photographed the Crimean War. Another Transylvanian, Iván Szabó from Marosvásárhely (the present Tîrgu Mureş in Rumania) received recognition abroad, in Edinburgh, for his photogrpahy.

In 1857–58 Pál Rosti visited Central and South America, and recorded his experiences on waxpaper-negatives. Four albums survived of his photos: one can be found at the National Széchényi Library of Hungary; another at the Hungarain Museum of Photography; while the third one is in the possession of Loránd Eötvös Geophysical Institute. Rosti gave the fourth one to Alexander von Humboldt, which is now in the possession of Deutsches Museum in München.

In 1859 Ede Heidenhaus recorded the sights of Pest and Buda on large negatives which were later published in an album too.

In the 1860s photographic studios opened one after the other, and became an integral part of services both in the capital and in the bigger towns of the country. The very first criminal photos are attributed to György Mayer, a photographer in Pest, who took stereo photographs of count László Teleki in 1861. Count László Teleki had committed suicide for political reasons. Antal Simonyi put together two albums of the Members of Parliament in 1861, Ignác Schrecker made several albums of the members of the Hungarian Academy of Sciences in 1865. Emperor Francis Joseph I was crowned Hungarian King in 1867, and for this occasion Ágoston Bülch produced full-sized, coloured photographs of the participants of the ceremonial procession in Pest, and later sent his album to the royal couple as a homage present. An attempt was made by József Heller to record the open-air events of the coronation ceremony but for technical reasons he couldn't get a good enough image.

Ferenc Veress, ran his business in the Transylvanian town of Kolozsvár (currently named Cluj- Napoca in Rumania), and put together albums of the town in 1859

and then photographed famous scenes and settlements of Transylvania. He formulated an experimental method of producing photoceramics, and from then on, he made several hundreds of them in his studio. He experimented with colour photography for decades, from 1866 until his death in 1916, and left behind hundreds of coloured paper-prints, also called heliochroms.

Two very important studios were established during the decade of the 1860s: the first was of Ede Kozics' in Pozsony, which is presently Bratislava in Slovakia, and the other was Gondy and Egey's in Debrecen. Photographic dynasties evolved all over the country. In addition to the Strelisky studio in Pest (founded in 1843) was the Knebel family's studio located in Szombathely, Langsfelds' was in Kaposvár, and the Divald family's studios were in located throughout towns in Upper Northern Hungary (Felvidék) and appeared later in the capital as well.

György Klösz is considered to be one of the most significant photographers of the 19th century. His pictures depict Budapest's last third of the century and its evolution into a metropolis. Also interresting are his photographs which illustrate the conditions preceding these changes. In the last years of the century Klösz systematically photographed the castles of the aristocracy, and took shots of the exterior of the buildings. He also photographed scenes of representation and more intimate, private life in addition to the well-kept and diverse castle parks, thus leaving exceptional treasures and unique documents of aristocratic ways-of-life for posterity. In 1879, he recorded the catastrophy of Szeged, which was destroyed by the flood of the river Tisza. Klösz took shots from a boat using large collodion glass plates to document this tragedy.

Károly Divald faced dangerous situations on the mountain paths of Tatra when he photographed the beautiful views of the mountain between 1860 and 1880. He too worked with collodion wet plates.

Balázs Orbán wandered all over Székely Land (Eastern Transylvania) between 1862 and 1868, taking photographs of the scenery and the inhabitants.

Chromotypes were treasured and were rare photographs. Only the well-equipped studios were able to produce them. Amonst the qulifies studios were that of Lipót Strelisky, Ignác Schrecker, Doctor and Kozmata, Ede Ellinger and his brother, István Goszleth, József Heller, Emil Keglovich, Károly Koller, Ferenc Kozmata, Ede Kozics, and László Naschitz.

The works of Hungarian photographers have won a number of honourable mentions and awards at foreign exhibitions, for example Lipót Strelisky received Mention Honorable for his chromotype at the 1867 World Exhibition in Paris. Also, at the 1900 World Exhibition in Paris his son, Sándor won the Grand Prix for his composit photograph titled "Csárdás," which was put together from photographs of significant actors of the time. Jakab Marastoni was the first to present his daguerreotypes at a Hungarian exhibition, which consisted of 20 photographs in 1842. Lipót Strelisky displayed two daguerreotypes at the exhibition of Pesti Müegylet (Society for Supporting Art) in 1846. Photography however, was met with really great success at the Hungarian General Exhibition of Budapest in 1885 and at the Millennial Exhibition in 1896.

In 1890 an exhibition of amateur photographers' works was organised in Budapest. Amongst those amateurs were some aristocratic photographers as well, like count Mihály Esterházy. Hungary's most famous aristocratic amateur photographer however, was archducess Isabelle who was of Belgian decent, but through her marriage she became member of the Hapsburg family and of the Hungarian aristocracy. Her photographs depict her family-members, their forms of entertainment, the agricultural works on their vast estates, the people of these lands, and the beautiful natural environment too. In her legacy both large (21 × 27 cm) glass negatives and contact copies of the period platinotypes are found.

Several Hungarian expeditions reached exotic places of the world and took photographs of rare occurences. After Pál Rosti, János Xantus travelled to Southeast Asia and Japan in 1869. An expedition led by Sámuel Teleki travelled to Africa between 1886 and 1889, during which the leader and one of the members, Lajos Höhner took photographs. The expeditions of Jenö Zichy in 1895, 1896 and 1898, sought traces of Hungarian prehistory, photographing the regions and the peoples of Caucasus and Central Asia. Mór Déchy chose the Himalayas (1877) and Caucasus (1884–1902), and count Rudolf Festetics targeted the islands of Oceania for scientific study and photography. The untiring globe-trotter and art collector Ferenc Hopp, while travelling round the world five times between 1882 and 1913, also photographed exotic spots.

Many of the photographers dealt with photomechanical duplication, the first if which was Károly Divald, then Ferenc Kozmata, Antal Weinwurm and last György Klösz.

At the end of the 19th century, photography was drawn into public administration, in the form of photo identification papers, and in criminal records—particularly in 1898 when photo albums were compiled of pictures of 'subversive elements' who were banned from Budapestand, and given to major police stations for idintification. Photography also became important to the sciences, equally used for ethnography, medicine and astronomy (in the latter field the names of Jenö Gothard and Miklós Konkoly-Thege should be noted).

From the 1890s a new group of private photographers joined the professional and amateur photographers. These new phtoographers were emplyed by the intelligentsia

and the bourgeois class of society. These people photographed those moments of life which did not interest or rather escaped the attention of the "old" photographers. The shots of private photographers have grown to be the primary sources in the research of everyday life of the old days and as such, their numbers rocketed at the beginning of the 20th century.

Etelka L. Baji
Translated by Katalin Bognár

See also: Daguerre, Louis Jacques Mandé; Petzval, Josef Maximilian; and Divald, Károly.

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HUNT, LEAVITT (1831–1907) AND BAKER, NATHAN FLINT (c. 1822–1891)

American photographers

Leavitt Hunt and Nathan Flint Baker were the first Americans to photograph in the Middle East. Traveling together on a Grand Tour that took them to Egypt, the Holy Land, Lebanon, Turkey, and Greece during the winter of 1851/52, Hunt and Baker planned from the outset to exploit both the novelty of photography and Europe's and America's intense fascination with the Orient by selling the prints made from the negatives they would take. They used the waxed paper process to make what they believed would be the first photographs brought back from the Middle East, and returned with approximately sixty good paper negatives—the majority from Egypt, but including views from Petra in Jordan, Jerusalem, Baalbek in Lebanon, and Athens. However, the demand for their photographs they anticipated never materialized and relatively few prints were made, most of which remained in family hands until they were deposited in institutional collections. Only a handful of Hunt's and Baker's prints have ever appeared on the market, and they are among the rarest and most desirable early American paper print photographs.

The partnership of Leavitt Hunt and Nathan Flint Baker was based on family connections and opportunity. Leavitt Hunt was the youngest and most scholarly of the four talented sons of Jonathan Hunt, a wealthy

Vermont judge, banker, and Congressman—both William Morris Hunt, one of the most talented American artists of his generation, and Richard Morris Hunt, the great architect were Leavitt Hunt's brothers. After her husband's death in 1832, Mrs. Hunt moved the family to Paris so her children could receive European educations. While his brothers studied art, architecture and medicine in Paris, Hunt attended boarding school in Switzerland, then took a law degree from the University of Heidelberg in Germany, and in 1851, was enrolled in the Swiss Military Academy in Thun. He was fluent in French, German, Italian, Latin, Greek, and Hebrew and could read Farsi and Sanskrit, and he had traveled throughout Europe, including Scandinavia and Russia. Baker, an independently wealthy amateur sculptor from Cincinnati, had been a student of Hiram Powers in Florence, and had been living in and traveling throughout Europe since the early 1840s. He was an old friend the Hunts, and when he told them of his plans to make an extensive tour of the Orient in the winter of 1851/52, Leavitt Hunt expressed an interest in joining him. They rendezvoused in Florence, Italy, in late September/early October 1851, spent the first two weeks in November in Rome practicing photography, then sailed from Naples to Malta en route to Alexandria. For the next six months Hunt and Baker traveled together in a journey that took them up the Nile and into the Sinai; to Petra; to Jerusalem; to present-day Lebanon; to Constantinople; and to Athens, before they returned to Paris in May 1852.

Hunt and Baker's photographs are mostly of the major architectural monuments they encountered on this tour: the Sphinx and pyramids at Giza; general views and details of the temple complex at Karnak; elements of the Ramesseum at Thebes; structures on the Island of Philae (where they ended their trip up the Nile); buildings of the Monastery of St. Catherine's at Mt. Sinai; rock-cut temples and tombs at Petra; the Church of the Holy Sepulcher in Jerusalem; ruins at Baalbek; and the buildings on the Acropolis in Athens. The photographs, unfortunately, do not offer a comprehensive record of their journey: there are no images from Constantinople, for example, although Baker wrote his sister that they made a number of photographs there.

Hunt and Baker's negatives measured approximately 18 × 24 cm and were made by the waxed-paper process. Some of the images were made as personal works, but most appear to have been collaborations. In making their views, Hunt and Baker did not typically position a human figure in the image to give a sense of scale, but their photographs are carefully composed to balance description with aesthetic appeal, and are of a consistent technical quality that is indicative of a comfortable familiarity with their materials. Among the sixty-odd known images by them that survive, two are especially noteworthy: a photograph of a *ghawázi* (a woman belonging to a caste of female dancers who performed unveiled in public and could therefore be photographed) that is signed in the negative by Hunt and is perhaps the earliest camera portrait of a Middle Eastern woman; and a view of the Parthenon that is notable simply because it is of the less noble, therefore less photographed, rear façade of this well-known classic building.

Hunt and Baker printed their negatives in Paris in June and July 1852, making enough prints to assemble two complete sets of images, with extra prints left over. Hunt assembled one set into an album, which he kept. Baker returned to the United States with the other set and left it with an unidentified print dealer in New York to test the market. The negatives and remaining prints were divided between Hunt and Baker, with Hunt apparently keeping most of the prints. After showing his album to the King of Prussia and presenting a portfolio of eleven prints to Karl Richard Lepsius, the preeminent German Egyptologist of the19th century, Hunt appears to have lost further interest in promoting his and Baker's achievement.

Neither Leavitt Hunt nor Nathan Flint Baker showed any interest in photography after this. Baker returned to Cincinnatti and pursued the life of an independently wealthy gentleman. Leavitt Hunt completed his studies at the Swiss Military Academy, and returned to the United States in 1855 to take a second law degree from Harvard. He practiced law in New York until the Civil War broke out, when he enlisted as a lieutenant in a New York regiment; he served on General Heintzelman's staff, and was brevetted to the rank of Lieutenant Colonel for gallantry at the Battle of Malvern Hill. Invalided out of the service in 1862, Hunt returned to his law practice in New York, but retired to Weatherfield, Vermont in 1867, after his wife inherited her father's estate there. Hunt spent the remainder of his life as a gentleman farmer, living in a house filled with the exotic souvenirs of his travels.

Hunt and Baker's photographs are both extremely rare and seldom seen. Hunt's personal album is now in the collection of the Bennington Art Museum, Bennington, Vermont. The set of prints Baker left in New York is unaccounted for and presumed lost; however, some of the negatives he kept recently surfaced and are now in a private collection. The portfolio Hunt sent to Lepsius is now in the collection of the Museum Ludwig/Agfa Foto-Historama in Cologne, Germany. Any negatives that Leavitt Hunt may have had are lost, but most the prints he kept became the property of his brother Richard Morris Hunt and most of them are now preserved in the Richard Morris Hunt Papers, the American Architectural Foundation, Washington, D.C. Any prints kept by Hunt's family were donated to the Library of Congress years ago. Outside these holdings, the single prints in the Hallmark Collection and at George Eastman House, and the six prints in the Harrison D. Horblit Collection

of Early Photography at Harvard University are the only other known examples of this very rare work.

WILL STAPP

See also: Architecture; and Itinerant Photographers.

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HUNT, ROBERT (1807–1887)

Robert Hunt was a representative figure among the 'men of science' who played a prominent role in British photography during the first two decades of its existence. Hunt produced some photographs (chiefly nature prints of leaves, etc.) and developed a direct positive paper that he marketed, but his principle contribution to photography came from his pen and his role as an organiser. He became interested in photography soon after its announcement: experimenting with processes, and publishing his findings. The manuals he wrote stemmed from this work. In 1841 he authored, what is usually seen as the first book on photography in English: *A Popular Treatise on the Art of Photography*, following this in 1844 with *Researches on Light*. During the 1840s and 1850s he wrote a series of influential articles on the photography in *The Art-Union* and its successor *The Art Journal*. In 1847, Hunt was a founding member of the Calotype Club. As a member of the group charged with negotiating with William Henry Fox Talbot he also played an important role in Talbot's partial abandonment of his patent claim on photography; in 1853 he seconded the motion calling for the foundation of the Photographic Society; and, in 1854, he served as Vice President when the organisation was formed.

Hunt, described by the editor of the *Art Journal* as a 'self-raised man,' trained with a London surgeon and ran a medical dispensary before making his rise through the scientific establishment to become Keeper at the Mining Records Office, and Professor of Mechanical Science at the Royal School of Mines. Intellectually, Hunt was a Utilitarian; an advocate of Natural Theology and a partisan of the particle, or 'corpuscular,' theory of light. He maintained, until the mid-1870s, that the sun's force was composed of three distinct elements: heat, light and photographic power or "Energia," a view he propounded in his *Researches on Light*. This cluster of commitments puts him at some distance from the dominant Cambridge network (Talbot, Herschel etc.) and finds the closest parallel in the work of Sir David Brewster; indeed, there are many common themes in the photographic writings of the two savants.

Hunt's writing is, in one sense, typical of the period: his early manuals mixed the most prosaic technical descriptions of processes and banal history of inductive discovery with wild figural passages (in one instance peoples are attributed racial characteristics according to their exposure to the sun's rays). Nevertheless, it is possible to draw out some structuring assumptions from his writing. Hunt—in line with other prominent men of science—viewed photographs as 'light-drawn pictures' that were 'geometrically true' (*Researches on Light*, 34). "Wherever a shadow falls," he argued, "a picture is impressed' that demonstrates 'unerring fidelity" (278). In his account photographs are characterised by "extreme fidelity," and 'minuteness' and the active agent is not the photographer—they were untouched by "human handling"—but the sun or nature who "impresses herself." It was the absence of 'mind' or intellect in photographs that made them valuable as copies. This approach constitutes, what historians of science would see as, an "objective" vision in which a seemingly automatic apparatus supplies the detached scientific observer with unerring documents.

Hunt's vision of photography shares two key features with the account put forward by Brewster. Firstly, he inflected the standard figuration of the sun as the principle agent involved in the creation of photographs in an industrial direction. For him, the sun appeared as a natural power (like steam) that could be harnessed by modern science in the service of industry. The "Talbotype" was, he said, "an instrument of new power placed at the disposal of ingenuity and of Art, and which, as in the case of the electrical machine and galvanic trough, may be expected to suggest countless new applications and developments of its principle" ("The Application of the Talbotype," 195). By "Art"he meant the mechanical arts or trades. Secondly, Hunt (like Brewster) differed from Talbot and the Cambridge men in their estimation of photography's relation to the Fine Artist. Talbot was, at best, ambiguous on this matter: largely unconcerned with art he wanted an apparatus that would mechanically substitute for skill with a pencil. Talbot's

primary impetus was to free men of science from their reliance on artists in the production of records or documents, but he does not appear to have been particularly bothered about the effect this project might have on wider conceptions of Fine Art. Hunt, in contrast, was careful to restrict the employment of the automatic copy in a way that would leave Fine Art untouched. In his account, the photograph appears as an aid to the artist (a faithful assistant) and not a replacement for "genius" or "the play of fancy." "The absence of mind," which was so efficacious in the production of documents, undermined any claim to rival Fine Art. "The Sun," he said, "will continue to be a very bad painter, too literal in his details' and could not therefore 'supersede the labours of the artist" ("The Application of the Talbotype," 195). This is a familiar Academic argument. In the same vein, he suggested the real problem was that: "men will be led to copy from the photographic picture rather than study from it..." ("Photography: Considered in Relation to its Educational and Practical Value," 261). He also opposed attempts by photographers to rival "the historical painter"; composition photographs, he thought, "have a tendency to lower the appreciation of Art in the eyes of the public" (Photographic Exhibitions, *Art-Journal*, February 1856, 49–50). Hunt, then, set photography in distinction to art. At the same time he employed the terminology of Academic art theory to describe the photographic image: "littleness," "breadth of effect," "mind" contrasted to copying, and so forth. It would take a great deal of work on the part of the next generation to generate an account that could speak of art and photography together; even then it would not prove entirely possible to reconcile these terms.

STEVE EDWARDS

Biography

Robert Hunt was born in Plymouth Dock (now Devonport) in 1807. The posthumous son of a ship's carpenter, or a navel officer (probably one and the same), he became one of the key scientific popularizers of the time, writing a series of introductory books and publishing articles in *Art Journal* and *Athenaeum*. His most important posts were held at the Mining Records Office where he was Keeper, and the Royal School of Mines where he held the chair of Mechanical Science, from these institutions he pursued a conception of science geared to needs of Britain's mine owners. In 1854, as a result of this work, he was elected Fellow of the Royal Society, and in the following year to Fellow of the Statistical Society. He also authored the *Hand-book to the Official Catalogues of the Exhibition of 1851* (2 vols., Spicer Brothers & W. Clowes, 1851). In addition to these scientific works, Hunt also wrote romantic poetry and Cornish folklore. After Andrew Ure's death, he became the editor of *The Dictionary of Arts, Manufactures and Mines*, producing three editions. His mission to popularise science also resulted in an odd novel *Panthea: the Spirit of Nature (A Sketch)*, (Reeve and Benham,1849). Hunt's involvement with photography was confined to the 1840s and 1850s; he died in 1887.

See also: Calotype and Talbotype; Edinburgh Calotype Club; *Photographic Art Journal (later Photographic and Fine Art Journal)*; and Talbot, William Henry Fox.

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HURTER, FERDINAND (1844–1898) AND DRIFFIELD, VERO CHARLES (1848–1915)

In 1863, at the age of 15, Vero Charles Driffield became interested in photography. Ten years later, he worked at Gaskell Deacon and Company in Widnes, Cheshire, England, and formed a lifelong friendship with the works' chemist, Dr Ferdinand Hurter, through mutual interests in music and Switzerland. In 1876, Driffield encouraged his friend to take an interest in pictorial photography, but unreliable exposures, and the lack of knowledge relating to the action of light on photographic plates, frustrated Hurter. To determine the strength of daylight, he designed and patented the Hurter Actinometer, but found lighting conditions were liable to change whilst making the necessary calculations.

Hurter's scientific approach impressed Driffield and the men modified the actinometer to produce permanent images of daylight on sensitised paper. For twelve months, between 1885 and 1886, Driffield collected the "daily diagrams of light," which were compressed into a set of monthly charts. In a further refinement, they transferred the information from twelve charts onto

one sheet, which became the database for a patented exposure calculator, the Actinograph. From 1888 to 1892, Driffield sold the device from Widnes until the photographic specialists, Marion and Company, London, took responsibility for marketing it.

The Actinograph's instructions explained how to find the rapidity of photographic plates, and make use of it as an actinograph number. The procedures had evolved from theoretical work carried out by Hurter, and corroborated in practical experiments by Driffield. Hurter reasoned that a photographic plate was inert to the action of light until sufficient energy overcame its *inertia* and by converting this parameter to a number, it indicated rapidity, or the film speed. Because it was feasible to measure all commercially available gelatino-bromide plates, Hurter and Driffield advocated the merits of accurate camera exposure and decried the prevalent rule-of-thumb approaches.

During 1888 and 1889, the two men collaborated in a further series of experiments and presented the results of their investigations to the Society of Chemical Industry in May 1890. It had been necessary to build equipment to give controlled exposures to photographic plates and to design apparatus to measure the photographic deposits of silver, for which they introduced the term "density." By plotting their test results as a diagram (the H & D curve), they characterised the parameters of different plates, and determined their speeds. Hurter and Driffield also examined the effects of exposure, variations in development, the behaviour of developers, and the criteria for the theoretically perfect negative.

The photographic community welcomed the comprehensive nature of Hurter and Driffield's investigations, but one important conclusion contradicted the perceived wisdom of the time. They claimed errors in exposure could not be corrected during development, and this assertion outraged many contemporary commentators. Hurter and Driffield were later criticised for using the government-approved standard candle for testing plates intended for use in daylight, and for selecting ferrous oxalate as the standard developer, instead of a pyrogallol-based type. Because their resources were committed to defending a controversial doctrine, the potential benefits of the Actinograph, and actinograph speeds, were overlooked.

Twelve months after Hurter and Driffield had announced their conclusions, an enthusiastic amateur photographer, John Sterry, alerted Marion and Company to the merits of Hurter and Driffield's technique for determining the sensitiveness of photographic plates. In September 1891, he disclosed to Driffield that "the partners are now thoroughly interested in adopting the test methodology." Ten years earlier, the Editor of *The British Journal of Photography*, had encouraged Alexander Cowan, (the manager of Marion and Company's Southgate works), to establish a reliable standard of sensitiveness. Despite the initiative failing, Cowan had continued to seek a test method for quality control in the manufacture of plates.

The manager of Marion and Company's London office, Frank Bishop, also identified the marketing benefit in providing numerical values to indicate the rapidities of each of the company's four brands of plates. With Driffield's help, Sterry convinced Messrs Bishop and Cowan, and Marion and Company announced the initiative would commence in 1892. Advertisements by the company in *The British Journal Almanac* for 1893 explained that after "more than twelve month's experience in testing by the Hurter and Driffield method, we are in a position to state its absolute correctness." At the time, the speeds continued to be expressed in actinograph numbers.

Within two years, as plate making techniques improved, other manufacturers showed interest in the methodology, which was now being used by Marion and Company to determine H & D numbers. James Cadett (principal of Cadett and Neall) also recognised its worth, but he and Alexander Cowan realised a limitation was the reliance on the standard candle as the exposing source. Driffield had selected it on grounds of economy and because it had been approved by Act of Parliament in 1860 (for monitoring the quality of coal gas).

Hurter and Driffield agreed to replace the candle with gas-powered lamps, which were a better match for daylight and better suited to the examination of orthochromatic and panchromatic emulsions. During 1896 and 1897, Driffield also resisted arguments that the ferrous oxalate developer should be replaced by a pyro-based one. In a lecture to The Royal Photographic Society in January 1898, during which they received the Progress Medal, Hurter and Driffield announced important concessions and thus consolidated the acceptance of the H&D Speed System.

Hurter died eight weeks later, and his partner declined to undertake any further research in photography. Driffield applied himself to his career in the alkali industry but devoted his leisure time to practical photography and Widnes Photographic Society, of which he was a founder member. At the start of the 20th century, the H&D Speed System was a recognised guide to film speeds, and retained a currency in parts of Europe until the outbreak of the Second World War.

Following Driffield's death in November 1915, The Royal Photographic Society acquired his experimental notebooks, letters and papers, which included those of his late partner, Ferdinand Hurter. The material was sorted and arranged by William Bates Ferguson as The Driffield Bequest.

Ron Callender

Biography

Driffield, Vero Charles 1848–1915

Engineer and amateur photographer

Vero Charles Driffield was born in Prescot, Lancashire, England on 7th May 1848. His childhood was spent in London, prior to education at Liverpool Collegiate Institution, Sandbach Grammar School, and a private school in Southport, Lancashire. Driffield's interest in photography began in 1863, and at the age of 17, he enjoyed six months' work experience in the Southport studio of Henry Sampson, where he received grounding in the wet-plate process and emulsion making.

Following an apprenticeship, Driffield joined Gaskell Deacon and Company of Widnes, Cheshire, as works' engineer in 1871. During a lifetime in the alkali industry, he worked on manufacturing processes. When the company amalgamated as part of the United Alkali Company in 1890, the new board appointed Driffield works' manager, until he retired in September 1915. He died at home six weeks later.

In 1877, Driffield married Ethel Bowles Fripp, who died whilst giving birth to a daughter the following year. His daughter, May, survived and was the subject for many attractive portraits and experimental photographs by her father for the next thirty years.

At Gaskell Deacon and Company, Driffield met Dr Ferdinand Hurter, and the two men collaborated in photographic research until Hurter's death in 1898.

Hurter, Dr. Ferdinand 1844–1898

Industrial chemist and part-time photographic investigator

Ferdinand Hurter was born in Schaffhausen, Switzerland, in March 1844 and educated at the Gymnasium. At the age of 19, he worked for a silk dyer and successfully completed a course in chemistry at Zurich Polytechnic. In 1865, his tutor arranged for him to read at Heidelberg University and under a system of continuous assessment, he studied modules of meteorology, stoichiometry, climatology, analytical and organic chemistry.

In 1865, he graduated with the highest honours and came to Manchester. Henry Deacon of Gaskell Deacon and Company engaged him as a personal assistant, but promotion to works' chemist soon followed. When the company amalgamated to form the United Alkali Company in 1890, the board of directors appointed Hurter as Chief Scientist, with a commission to create a central research laboratory.

Until his sudden death in 1898, he worked on improvements to many processes to meet a need for efficiencies within the alkali industry. He was a founder-member of The Society of Chemical Industry, and served on committee for many years as well as contributing important lectures.

In 1871, he married Hannah Garnett, and had four children. In his leisure time, he undertook photographic research in conjunction with his colleague, Vero Charles Driffield.

See also: *British Journal of Photography*; and Photographic Exchange Club and Photographic Society Club, London.

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I

ICELAND

Photography was one of the very few technical innovations which the people of Iceland were able to adopt in the 19th century. The country was a Danish colony, its social structure undeveloped, and its population sparse: in 1840 there were only 57,000 inhabitants in an island with an area of 103,000 square kilometres. Daguerre's method became universally known in 1839, and just a few years later this technology was brought to Iceland by Icelanders who had learned it in Scandinavia and also by foreign travellers, especially the French and the British, who visited Iceland on research expeditions or pleasure trips.

The oldest photographs of Iceland which have been preserved are two daguerreotypes taken by the French mineralogist Alfred Des Cloiseaux (1817–1897) in Reykjavík in 1845. The early stages of photography in Iceland were rather protracted. Three things in particular account for the length of time it took for photography to put down roots there. Most of the inhabitants lived very simple lives; the country was in its very first stages of urbanisation; and the art of portraiture had not become established among the people even though there were a few local artists who had studied at the Academy of Art in Copenhagen.

Photography in Iceland, therefore, differs from photography in other places in Europe because it fell to the lot of photography to create a tradition of portraiture and so it was in fact the precursor of the painted picture. From 1845 until after 1860, a few people tried their hand at photography but they practised it only for a short time. Two of them took photographs using the daguerreotype, but none of their images have survived. Customers were slow in coming forward, technical difficulties took their toll on production and photographers had to depend for their photographic materials on the infrequent arrivals of ships from abroad.

The turning-point occurred when the photographer Sigfús Eymundsson (1837–1809) started working in the country's burgeoning capital city, Reykjavík, in 1866. He became the first photographer in Iceland to succeed in making a living at photography, although he was engaged in many other activities over the course of time. He pioneered various innovations in photography, such as the multiple reproduction of portraits of prominent Icelanders, imitations of sterescopes featuring identical photographs side by side but without the three-dimensional effect and, starting in 1874, he took the first scenic photographs in large format, which he sold to foreign visitors. A considerable selection of original photographs by Sigfús has been preserved, and his collection of plates is in the Þjóðminjasafn Íslands (the National Museum of Iceland).

As urban areas developed and the population density increased, so did the number of photographers, and as soon as villages such as Djúpivogur, Ísafjörður and Akureyri had the capacity to support them, they acquired their own photographers. Among them was Nicoline Weywadt (1848–1921), the first woman photographer, who did her training in Copenhagen, Denmark (as did the majority of Icelandic photographers up until 1890) and who began working in 1872 in Djúpivogur in Eastern Iceland. In the year 1890 there were 10 photographers working in eight places and by 1900 this had increased to 23 in 16 places.

As the number of photographers grew, basic training in the subject was shifted to Iceland, but most photographers still got their advanced training in Denmark as before. Photography was closely related to handicrafts and trade and those who worked at it were generally working in other branches of the craft industry, or as tradesmen, or were the daughters of shop managers or civil servants. Their product was principally portrait photographs. As settlements were far-flung, the

photographers had to travel around the rural areas of the country or to other villages in order to come into contact with sufficient customers. Two kinds of portrayal other than the traditional portrait rapidly became firm favourites in Icelandic photography: pictures of people in front of their farmhouses, and pictures of people on horseback. Photographs taken by overseas visitors may have started this trend, since the foreigners were intrigued by the fact that, until well into the 20th century, farmhouses were usually turf houses and horses were the main method of transportation in Iceland. As very few photographs from Iceland dating from the 19th century have been preserved, the photographs taken by foreign travellers have great historical value.

The first publication of Icelandic photographs was produced for the Tourist Board of Iceland in 1896 and was intended for foreign visitors. The photographs showed the main tourist attractions of the country such as Gullfoss and Geysir (still the most frequently visited sites in Iceland) and most of the scenes were photographed by Sigfús Eymundsson. Ever since, landscape photography has been the dominant branch, apart from portraiture, in Icelandic photography, and its key mission has been to promote Iceland internationally and also to preserve Icelandic national identity.

Inga Lára Baldvinsdóttir

See also: Daguerreotype.

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ILLUSTRATED LONDON NEWS

Publication

The *Illustrated London News*, which commenced publication on 14 May 1842, was the first newspaper to regularly illustrate its topical news stories with woodcuts, drawings and photographs. This popular weekly was a forerunner of similar publications such as *L'Illustration* and *Harper's Weekly*. Its founder Herbert Ingram was born in Boston, Lincolnshire, England on 27 May 1811. Whilst working in the London printing industry he noticed that newspapers sold more copies when they contained woodcut illustrations. This encouraged him to launch the *Illustrated London News*, with Mark Lemon, the editor of *Punch*, as his chief adviser. Ingram hired skilled engravers and illustrators and the first edition sold over 26,000 copies and within a few months was selling 65,000 copies per week.

He recognised that photography could be used to enhance the publication. He hired the renowned portrait photographer Antoine François Jean Claudet to photograph a panoramic view from the top of the Duke of York's Column, Pall Mall, London. Claudet used a specially designed camera for the commission. An artist, C.F. Sargent drew the details of Claudet's daguerreotypes onto sixty wood blocks. The engraving was then undertaken by the firm of Ebenezer Landell. The resulting print was circulated to subscribers and proved to be a hugely successful boost to sales. Until the development of Scott Archer's collodion process, daguerreotypes had to be traced and stencilled onto wood blocks. In 1857, George N. Barnard invented a process whereby the collodion negative could be printed directly onto the block. This method was used until the advent of the halftone and line processes in the 1880s which allowed for the rapid production of illustrations.

The newspaper's images were often accompanied by first-hand accounts of notable events. In response to negative reports in the *London Times*, Roger Fenton was commissioned to photograph the Crimean War in 1855. He travelled with a horse-drawn photographic van and used the newly developed wet collodion plate. Fenton returned with over three hundred war scenes and military portraits, some of which were reproduced by the *Illustrated London News*. James Robertson also reported from the Crimea and engravings based on his photographs appeared in the newspaper. Other major events which were featured by the *Illustrated London News* include the Irish Famine in 1847; the Great Exhibition of 1851 and the outbreak of the American Civil War in 1861. Over 150,000 copies were sold of the edition that reported the funeral of the Duke of Wellington.

Ingram was a staunch Liberal who favoured social reform and this is reflected to a certain extent within the *Illustrated London News*, for example, he used the paper to further his campaign against child labour. Yet the newspaper generally reflected the interests and preoccupations of its middle-class readership and the concerns of the British Empire. Ingram was to die tragically when the steamship *Lady Elgin* sank on Lake Michigan in 1860. His widow Anne continued to run the business with the assistance of Mason Jackson, the paper's Art Editor. The newspaper's success continued into the twentieth century when it hired some of England's top

artists including Frank Reynolds and Henry Brock. It ceased publication in 1993.

ORLA FITZPATRICK

See also: Claudet, Antoine-François-Jean; Daguerreotype; Archer, Frederick Scott; Dry Plate Negatives: Non-Gelatine, Including Dry Collodion; Wet Collodion Negative; Barnard, George N.; Halftone Printing; and Fenton, Roger.

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IMPRESSIONIST PHOTOGRAPHY

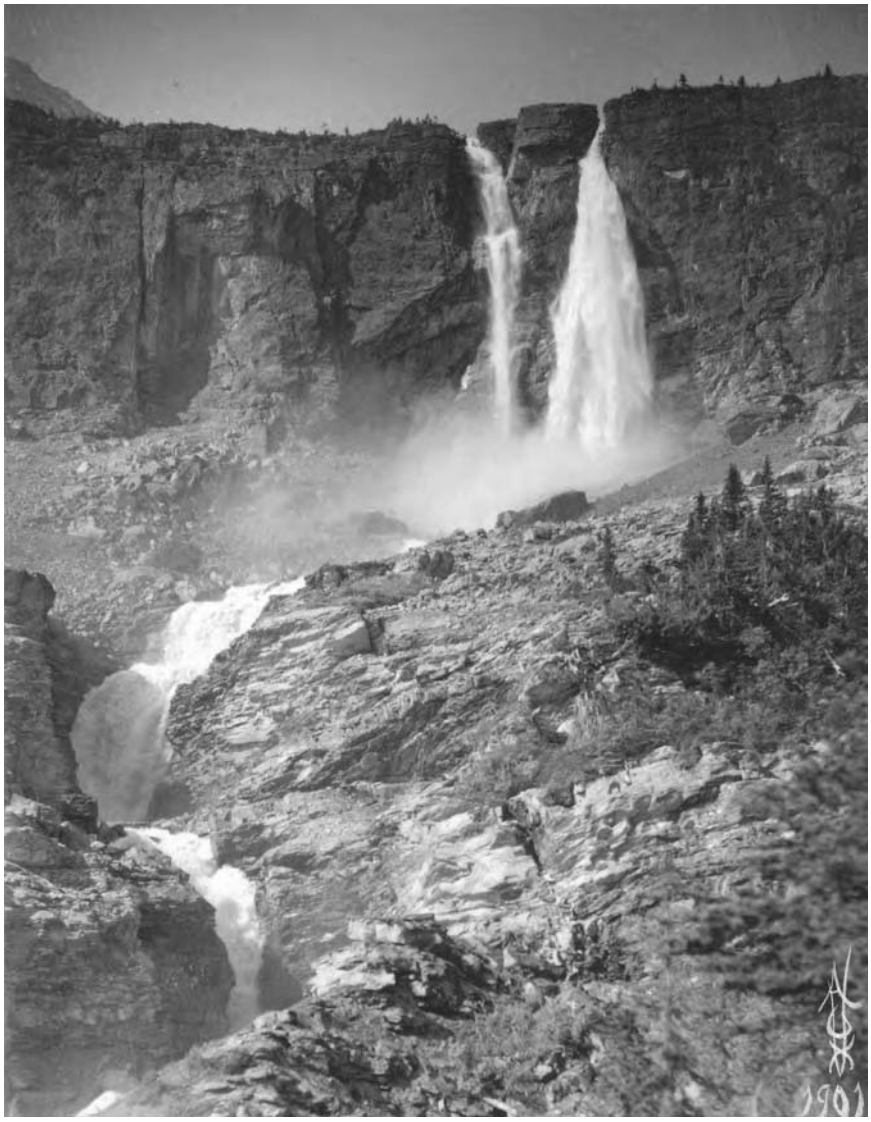
In the fall of 1890, George Davison gave a paper at the Royal Society of Arts called "Impressionism in Photography." He aimed to connect modern photography with modern art, explaining that the "newer school of photographers" and "the body of painters known as impressionists" embraced the same principles: "Our impressions are made up of light and light values in relation to one another—colour, form, binocular vision effect, focus, perspective." Davison rejected what he saw as the idealism of much photographic art, and argued instead for "a close observation of natural appearances under the materialistic tendency of the age" (Davison 1890, 823, 821). He distinguished between representations predicated on verisimilitude, and those arrived at through the personal interpretation of an artist, citing French and British texts such as Ernest Chesneau's *The Education of the Artist* (1886) and Francis Bate's *The Naturalistic School of Painting* (1887).

Davison provided a coherent reading of key formal and philosophical elements of the aesthetic, yet impressionism was a slippery notion. The very name was speculative; of the eight exhibitions of 'impressionist' painting in Paris, none used that appellation, which first appeared in Louis Leroy's satirical 1874 review of the first exhibition (partly inspired by Claude Monet's painting, *Impression; Sunrise*). Émile Zola called the new painters 'naturalistes,' and quite correctly, for the tenets of impressionism overlapped with naturalism and realism. This also pertained to photography; Peter Henry Emerson argued that while "Impressionism means the same thing as naturalism," he preferred the latter, in which the work of art "can always be referred to a standard—Nature" (Emerson 1889, 22). Indeed, early 'impressionist' photographs are nearly indistinguishable from their 'naturalistic' counterparts. Both embraced the iconography of landscape and rural genre, and even the practitioners, such as Alexander Keighley and Lyonel Clark (see, the Linked Ring), were much the same.

In an 1891 article on art photography, James von Falke presented three definitions of impressionism. The first two accorded with the acknowledged perceptual basis, being "the reproduction of the impression made on the artist's eye," and the impression "which a landscape produces on the spectator's eye by virtue of its inherent character." The third version was that "understood in artistic circles, namely, the dissolving and indefiniteness of the forms and tones" (von Falke 1891, 393). This tallied with Leroy's criticism of the indefinition in *Impression; Sunrise*, and it conformed to the explanation given by Alfred Brothers in 1892. Defining the "attempt to produce by photographic means an imitation of what is called the 'Impressionist' school of art," he identified the principal "effect" as the production of an image being "what is called 'out of focus" (Brothers 1892, 302).

In part, this simply extended the popular equation of naturalistic photography and diffusion. A more direct provocation came from Davison's use of pinhole photography, first linked to impressionism at the 1889 Photographic Society exhibition, when the *Daily Telegraph* described Davison's "soft, impressionist work caught through a pinhole." Pinhole apertures originally had a scientific application, and only became practical for imaging once fast dry plate negatives shortened the exposure time. From 1888, they were used for a soft-focus effect, as were single lenses and slit apertures. Whereas naturalistic photography's analytic approach to vision and representation utilised selective focus, the uniform diffusion of pinhole photography accorded with the more synthetic experience of the 'impression.' All of this was incorporated in a long-standing argument about focus and diffusion (see art photography and aesthetics). Indeed, both impressionist painting and photography adopted established pictorial models; Monet based *Impression; Sunrise* on the traditional 'ébauche,' or painted sketch.

In 1888, the British photographer Graham Balfour suggested diffused focus as a photographic version of the summary execution practised by impressionist painters. A similar intention encouraged the adoption of manipulative processes such as direct carbon printing on Artigue paper (Charles Constant Puyo), brush-developed platinum printing (Joseph T. Keiley and Gertrude Käsebier), and additive marking on negatives (Frank Eugene), while in 1898, Fritz Matthies-Masuren recommended gum prints for "simple, painterly



George B. Jr., and Mary M. Vaux, William Sansom Vaux, Jr. Twin Falls, Yoho Valley, 100 ft. High, Mark Field, British Columbia.
The J. Paul Getty Museum, Los Angeles

effects." The inflected surfaces of such photographs were thought to further authenticate photography as fine art, in opposition to the machine-made perfection of manufactured printing papers. However, manipulated photographs were not acceptable to all. Both Emerson and Davison saw retouching as an adulteration or idealisation of natural, photographic truth, a view upheld by proponents of the 'straight print,' such as Frederick Hollyer and Frederick H. Evans.

The advocates of impressionist painting defended rapid brush work as the means of recording transitory phenomena. The photographer could hardly argue this necessity, for the camera could instantaneously capture a scene with detail and precision. The painters themselves were ambivalent about instantaneity. In 1872, Edgar Degas complained of the tendency among young painters to begin work without thought or premeditation: "The instantaneous is photography, nothing more" (Degas 1872, 220). This view was echoed by many photographers and attributed to the unconsidered work arising from snapshot photography. Yet instantaneity brought artistic benefits: practical exposure times could be obtained with low light levels, which suited the naturalistic and impressionist interest in atmospheric effects of light and weather (also see under night photography). In the 1890s, photography was credited with inspiring new compositional structures in art, as discussed by the editor of *The Studio*, Gleeson White, and the German art historian, Richard Muther. They identified aesthetic crosscurrents between snapshot photography, impressionism, and Japanese art; asymmetric and seemingly arbitrary framing, the compression of space, and an emphasis on foreground objects, presented as close-ups and functioning as dynamic compositional devices. Such elements appear in stereoscopic photography as early as the 1860s, and recur in later, 'pictorialist' photographs by Alvin Langdon Coburn, Theodor and Oskar Hofmeister, and Heinrich Kühn.

'Impressionist' characteristics of soft focus, restricted tonal range, and manipulative technique persisted in pictorialism, and in twentieth century processes such as bromoil and three-colour Fresson printing and commercially manufactured imitations of non-standard papers. Impressionism has been accused of being an ill-conceived imitation of painting, untrue to the essence of photography. Yet its diffused and expressive effects looked ahead to abstraction, and those most dismissive of the aesthetic championed a modernist photography that prioritised an objective vision—to see things as they are, without conventionalism—the very ethos of naturalism and impressionism.

HOPE KINGSLEY

See also: Davison, George; Zola, Émile; Emerson, Peter Henry; Landscape**;** Genre; Keighley, Alexander; Brotherhood of the Linked Ring; Brothers, Alfred; Naturalistic Photography; Photographic Exchange Club and Photographic Society Club, London; Dry Plate Negatives: Gelatine; Dry Plate Negatives: Non-Gelatine, Including Dry Collodion; Art Photography and Aesthetics; Carbon Print; Puyo, Émile Joachim Constant; Käsebier, Gertrude; Platinum Print; Gum Print; Hollyer, Frederick; Evans, Frederick H.; Degas, Edgar; Snapshot Photography; Night Photography; Stereoscopy; Coburn, Alvin Langdon; Hofmeister, Theodor and Oskar; Kühn, Heinrich; Pictorialism; Fresson and family, Théodore-Henri; and Bromide Print.

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INDONESIA (NETHERLANDS, EAST INDIES)

The colonial government in the Netherlands East Indies, now the Republic of Indonesia, quickly saw how photography could be employed to record Javanese antiquities and natural history. Only a year after Louis-Jacques-Mandé Daguerre's (1787–1851) invention had been announced in France in August 1839, the Dutch Ministry of Colonies commissioned Jurriaan Munnich (1817–1865), a medical officer to travel to Java to "test and employ photography in our tropical regions" and to collect photographic representations of the "principle views, etc. and also of plants and other natural objects." He was the first known daguerreotypist to have worked in the country. Largely due to technical difficulties, compounded by the climate, the 64 photographs he took were not very satisfactory; even his most successful image had an exposure time of 26 minutes.

In 1843 the Dutch government accepted a request from Adolph Schaefer, a German-born Daguerreotypist then working in The Hague, for permission to travel to the Netherlands East Indies in return for photographic work. Schaefer arrived there in June 1844 and first worked in Buitenzorg (now Bonger). In September 1844 he established what was probably the first portrait studio in the colony in the capital Batavia (Jakarta). Besides portraits he also made copies of paintings, etc. Evaluating the new technique, the Dutch-language newspaper the *Javasche Courant* (22 February 1845) stated: 'Those who like to be flattered should never long for a daguerreotype portrait; here there is no flattery, it is a mirror that reflects back both the imperfections and the beauties.' In April 1845 Schaefer was ordered to make Daguerreotypes of some of the collections of the Batavian Society of Arts and Sciences in Batavia and later in the same year he was sent to Central Java to make Daguerreotypes of the bas-reliefs of the Borobudur temple. He produced at least 58 successful images, many of which have survived. He later worked as an independent photographer in Semarang.

While the 1840s were dominated by government sponsorship of photography, in the 1850s the growing popularity of studio portraits created a market for a larg-

er number of itinerant photographers to visit the Colony. In early 1853 the itinerate photographer L. Saurman, who had earlier worked in Singapore, visited Batavia and operated 'Saurman's Daguerrian Gallery' from the Marine Hotel for a short time before travelling on. Later in the same year another itinerate photographer C. Duben, earlier active in Shanghai, Macao, Manila and Hong Kong, visited Batavia for the first time. The first photographer in Batavia who produced photographs on glass and paper was Antoine Francois Lecouteux. Starting in 1854, by mid-1855 he had teamed up with the Belgian-born portrait painter and theatre personality Isadore van Kinsbergen (1821–1905). Lecouteux took the photographs and Van Kinsbergen then colored or retouched these. Lecouteux was probably the first photographer to successfully operate a semi-permanent studio as distinct from the many itinerate photographers who traveled from one place to another in search of new clients, mainly rich European colonial officials, merchants and planters and to a lesser extent the Chinese upper class. Except for the local rulers, the indigenous peoples were in no way able to afford the prices asked.

In 1862 Isodore van Kinsbergen, by now a skilled photographer, acted as official photographer on a diplomatic mission to Siam and later that year accompanied the Governor-General on a tour of Java and Bali. His views of Bali were especially well received (he was also allowed to to take portraits of the captured leader of the Balinese resistance during his detention in Batavia in 1868). This led to another government commission to make a large-scale photographic documentation of Javanese antiquities which occupied Van Kinsbergen from 1863–1867, resulting in portfolios of some 350 prints entitled *Oudheden van Java* (Antiquities of Java). He then was commissioned to photograph the sculptures and reliefs of Borobudur. In the 1870s Van Kinsbergen established a portrait studio in Batavia in partnership with H. Salzwedel, who later operated a successful studio in Surabaya. Van Kinsbergen continued to operate a studio under his own name for the rest of the century and like most of his contemporaries specialized in portraiture.

In May 1857 two British photographers arrived in the Colony from Australia. Walter Bentley Woodbury (1834–1885) and James Page (1833–1865) had planned to stay in Java for only a short time before travelling on to other European colonies in the region. "Woodbury & Page" was immediately successful and continued to exist for nearly fifty years, long after their departure. First operating a portrait studio in Batavia, they quickly started to travel around Java in search of more clients. On these journeys they also took large plate topographical views of the towns and countryside they visited, and Walter Woodbury also produced stereo views. Some of the latter were marketed by Negretti & Zambra, London, in the early 1860s. Traveling beyond the main island of Java representatives of the firm produced an increasingly large selection of landscape views. Sold individually or in albums these were extremely popular as souvenirs or as gifts for family and friends back home. No other firm was to have such a large selection. Similarly they produced hundreds of different native 'types' of the whole archipelago, often published as cartes de visite. Mainly produced for the commercial market, these pictures were not so much a record of the lives of the inhabitants of the Netherlands East Indies than a record of how European photographers intended to depict them.

By the late 1870s all the larger towns and cities boosted a number a competent photographers and even in the smaller places studios were being established. By the end of the century the firm of "Woodbury & Page" was in decline, succeeded in popularity by larger, more efficient firms such as "Charls & van Es," established in the 1880s, with branches in Surabaya and Batavia. Returning to England in 1863, W.B. Woodbury went on to become a noted photographic inventor, while J. Page died a few months after his arrival from a tropical disease he contracted in the Indies.

Although many photographers, including "Woodbury & Page," had visited Sumatra the photographic firm of "G.R. Lambert and Co.," in Singapore was among the first to establish a permanent studio on the island in the 1880s. Some of the company's leading photographers such as C.J. Kleingrothe (Medan) and H. Ernst (Bindjai) were to remain on the island as independent photographers. Not coincidentally, this interest occurred at the same time when the Dutch authorities were expanding their presence into Atjeh in the north of the island by military force. While the official government Topographical Dienst operated their own photography division (established already in the 1860s using mainly military personnel), many photographers, both amateur and professional took photographs of these military campaigns, as well as of later campaigns on Lombak and Bali.

In the last decades of the nineteenth century also non-European photographers became active, a trend that would continue in the twentieth century. They were generally less expensive that their European colleagues. One of the few native born photographers was Kassian Cephas (1845–1912). Working in Jogyakarta, the Christian Javanese Cephas, later assisted by his sons, began his career as court photographer to the local ruler. Later he also received many government commissions and provided illustrations for scientific publications. Amongst the non-European photographers, the Chinese, often from Singapore and Hong Kong, were probably the largest group. One of the most successful was Tan Tjie Lan in Batavia. Other important groups were the

Japanese, such as Mazaraki in Medan, and the Armenians. Of the latter Onnes Kurkdjian (1851–1903), with a studio in Surabaya, was extremely successful. In 1904 his successors formed a limited liability company, a trend common amongst many of the larger firms at the time. In addition to studio work, they also sold photographic supplies, developed photographs and operated galleries to promote the art of photography amongst the rapidly growing market of amateurs. Already in the 1850 travelling photographers had offered lessons in photography. Later in the century most of the established studios as well as many stores offered cameras and other photographic supplies and developed the negatives of their clients who could also use their darkroom facilities. In 1902 there was even a magazine called the *Indisch Lux* published especially for this increasingly important amateur market.

STEVEN WACHLIN

See also: van Kinsbergen, Isodore; Woodbury, Walter Bentley; Page, James; Daguerre, Louis-Jacques-Mandé; and Daguerreotype.

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INDUSTRIAL PHOTOGRAPHY

While extensive research has been carried out into the more populist fields of photography—portraiture, landscape, architecture and documentary—remarkably little has been written about the emergence and importance of industrial photography in the nineteenth century. Arguably, as in so many other areas of photographic endeavors, the pioneering vision of William Henry Fox Talbot can be seen as the genesis of the industrial photograph. Albeit staged and posed—a manufactured image rather than an observed one– the two-part panorama of the printing establishment at Reading, England, showing photographers and photo-printers at work, can be labelled as the world's first industrial photograph.

Industrial photography as a discipline—as distinctly separate from the documentation of life and place as it is from the pursuit of the picturesque—is almost as old as photography itself. Industrial photography is the application of the medium to serve the needs of industry, of engineers, of manufacturers and of those whose role it was to promote industrial innovation throughout the world. If the legacy of Victorian portrait studios informs us of what our ancestors looked like, then the legacy of nineteenth century industrial photographers makes us so much more aware of how their world worked.

Photography was still in its infancy when its future potential value to industry was first recognised. Early in the 1840s, the eminent and forward-looking Scottish civil engineer, Alexander Gorton, proposed to the Institution of Civil Engineers that photography could soon serve industry well as a means of recording progress and change, enabling "views of building works, or even of machinery when not in motion, to be taken with perfect accuracy in a very short space of time and with comparatively small expense." That value to industry was already being exploited before the end of the 1840s, with the daguerreotype process being used to photograph machinery, the resulting images being used as sales aid by travelling salesmen. A number of these remarkable early images survive in both public and private collections in the United States. Rare daguerreotypes survive of examples of early machinery and of manufactured artefacts. Additionally, early occupational daguerreotypes survive, showing everything from blacksmiths at work to chemists in their laboratories, but these must be classed as occupational portraits rather than industrial images *per se.*

Before 1850, photography was, however, being used to record progress on major civil engineering projects. Contained within the Getty Collection, dramatic industrial daguerreotypes include whole and half plate views of a canal lock under construction (c. 1849), although in the absence of a full understanding of the context which surrounded their creation, it remains unclear if

these were taken to fulfil an industrial or simply pictorial remit.

The immense value of the easily duplicable paper print was ably demonstrated in the very early 1850s, and the illustrations produced for the *The Reports of the Juries* produced after the Great Exhibition of 1851 at London's Crystal Palace stand as one of the first commissioned uses of the medium to record, preserve and celebrate industrial achievements. Indeed, amongst the first images produced in Britain which might be classified as 'industrial' Mayall's dramatic views of the interior of the Crystal Palace at its original Hyde Park location might be included. Numbered within the one hundred and fifty four calotypes printed for the *Reports by the Juries*—of which one hundred and thirty copies were printed—are detailed studies of the latest designs and inventions in agricultural machinery, railway locomotives, philosophical instruments, equipment for sugar refineries and other manufacturing processes, the latest designs for massive ship's anchors, and other products of the world's industry.

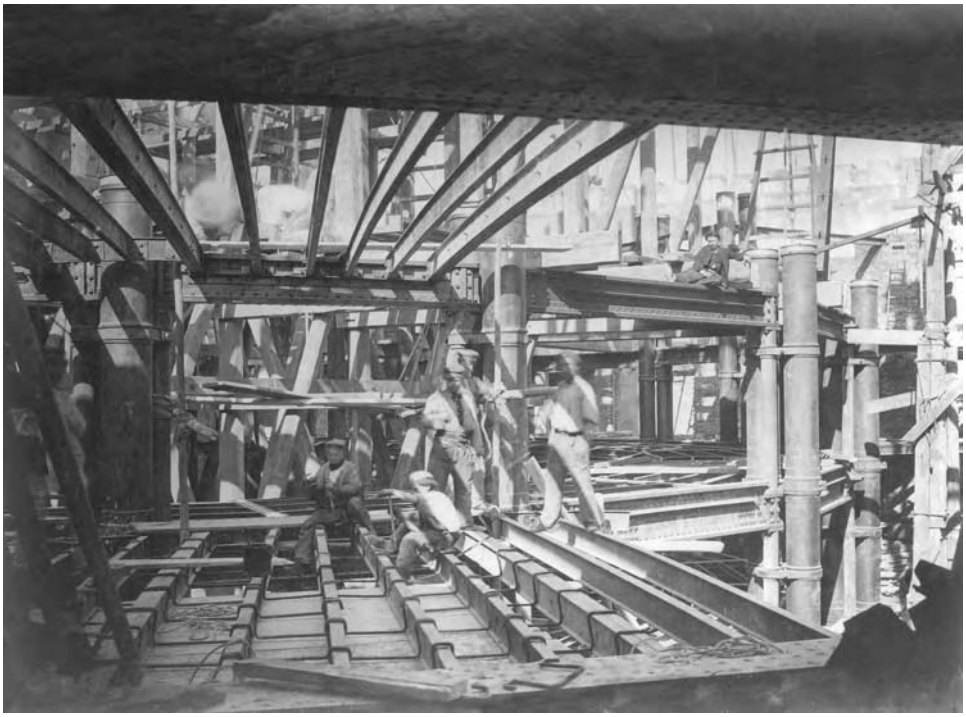
But it was a year earlier, in Philadelphia in June 1850, that the brothers William (1807–1874) and Frederick (1809–1879) Langenheim produced their first industrial photographs—presented as mounted salted paper prints of an eight-wheel steam locomotive built by the Norris Brothers of Philadelphia. Apparently taken as part of their, largely unsuccessful, attempt to promote the value of the 'Patent Talbotype' process in the USA, these images also served to demonstrate the value of photography in helping market engineering products.

In England a few years later, James Mudd (1821–1906) would fully exploit that market, when he embarked upon his long working relationship with the Beyer-Peacock locomotive engineering company in Gorton, Manchester. Starting initially with Gustave le Gray's waxed paper process in 1855, and later migrating to collodion, Mudd produced a priceless visual archive of the company's engineering output over a quarter of a century which survives to this day. Alexander Gorton's prophecy concerning photography's value to engineering proved correct when the engineer Charles Blacker Vignoles undertook the construction of the first permanent bridge over the River Dneiper at Kiev. While Vignoles was able to spend some of each year on site, his other commitments made it vital that he return to Britain for at least some of the year. He voiced his appreciation of the value of photography in helping him keep abreast of progress at the first ordinary meeting of the Photographic Society of London on 3 February 1853, and his comments were reported in the *Journal of the Photographic Society* a month later

> 'Mr Vignoles made a few remarks in illustration of the great services which the new art would be likely to render to engineers and others having to superintend important works which they could only occasionally visit, or having to make intelligible to foreign employers speaking a different language, with whom they could interchange ideas only imperfectly in conversation, the details of blocks and ropes, and complicated constructions. He instanced the pictures taken of the works now going on at Kieff for the suspension bridge he was erecting for the Emperor of Russia, over the Dneiper, on which photographic views had been taken weekly during the whole time of its construction, and especially of the method of raising the chains from the first tightening of the ropes to final elevation of the whole to its proper position, which have been shown with the greatest accuracy and detail.'

Some of those photographs were taken by Roger Fenton during his single visit to the site in October 1852, but the majority of the pictures, taken throughout the three years of the bridge's construction (1851–1853), were, as far as can be ascertained, the only major professional photographic commission undertaken by the engraver and railway illustrator John Cooke Bourne (1814–1896). Bourne, Fenton and Vignoles were not unique in the mid 1850s. Contemporary with their endeavors in Kiev, the value of 'progress photography' was also ably demonstrated in London by Philip Henry Delamotte, whose remarkable photographic account of the dismantling of the Crystal Palace in Hyde Park, and its subsequent rebuilding in Sydenham, 1852-54, was eventually published in 1855 by the Photographic Institution, London, as *Photographic Views of the Progress of the Crystal Palace, Sydenham. Taken during the Progress of the Works, by Desire of the Directors*. The one hundred and sixty albumen prints from collodion negatives contained in these two volumes comprise the first comprehensive photographic document of a civil engineering project ever to be published.

The Exposition Universelle in Paris in 1855 was one of the undoubted spurs which moved French industry to recognise the value of the photograph. Macauley (1994) recounts the part played in this awareness-raising by the entrepreneurial photographer André Adolphe Eugène Disdéri who, after establishing a company specifically to market photographs during the exhibition, circulated letters to potential exhibitors drawing their attention to the potential sales growth which might accompany the use of photography in the promotion of their products. In describing his photography as 'artistique et industrielle' Disdéri may well have been the first to recognise industrial photography as a specifically focused discipline. By 1856, in France, according to Macauley, 'the term 'industrial photography' referred not only to the recording of architectural and engineering constructions but also to the cataloguing of manufactured goods for use by travelling salesmen or for general publicity.' Thereafter, the progress of almost every major con-



Durandelle, Edouard Charles Marville. Nouvel Opera, Details et Modeles Artistiques. *The Metropolitan Museum of Art, Gilman Collection, Gift of The Howard Gilman Foundation, 2005 [2005.100.377.1 (14)] Image © The Metropolitan Museum of Art.*

struction project throughout Europe was chronicled with the camera.

While the majority of industrial photography at this time was produced by generalists rather than specialists, and was the result of infrequent specific commissions, some people began to use photography on such a scale that employing outsiders no longer made any economic sense. Thus, the idea of the 'in-house' photographer was pioneered, with photographers on the company payroll carrying out the wide range of assignments, including industrial ones formerly contracted out. One of the first so to do may have been the Krupps steel-making company in Essen, Germany, who reportedly employed their own photographers from the later 1860s, and in the decades which followed, built up an archive of several hundred thousand images reflecting every aspect of the company's business.

In America, while the real expansion of industrial photography came during the nation's recovery after the Civil War, many photographs which fit within an industrial context survive from earlier dates. The extensive coverage of the California Gold Rush does offer a unique view of a young industry at a time when entrepreneurship rather than large corporate organisations still held sway. It is unlikely, however, that any of these pictures were taken within commissions which we would today recognise as industrial. More likely they were taken simply as records of the activities going on, or as the basis for wood or steel engravings to be reproduced in news periodicals.

In the 1860s, photographers crossed America with the teams of naval and civil engineers to build huge railroads, which produced pictures that were often as much about the grandeur of the scenery as they were about the engineering itself—and in so doing, they produced images which placed the engineering firmly within the context of the landscape. Amongst the photographers who chronicled these great unifying projects were Alexander Gardner, Captain A. J. Russel, John Carbutt and many others. In a fascinating image taken on 10 May 1869 by Andrew J. Russell and Charles Roscoe Savage at Promontory Point, Utah, the role of the industrial photographer and news photographer become one, and are themselves set in context, as the tracks from east and west met, and two huge locomotives stood head to head and a few feet apart. In the foreground, the photographer's second camera stands in one corner of the image.

The photography of mammoth ship-building projects, like the construction of Brunel's 22,000 ton *Great Eastern*, then the largest ship in the world by quite a margin, resulted in iconic images. Robert Howlett's pictures of the huge ship under construction at John Scott Russell's shipyard on the Thames at Millwall demonstrate that, as early as 1857, industrial photographers recognised the importance of camera position. Howlett placed his camera in such a way that the magnitude of the construction was emphasised, creating images which could hardly be bettered a century and a half later. Yet it is the iconic portrait of Brunel himself—the classic *industrial*

portrait—which is the most memorable, more memorable than the huge ship herself. The juxtaposition of the engineer and the massive anchor chains of the monster he has created produced a unique combination of man and machine, emphasising the apparently limitless scale of man's visionx—that one small man could envisage and then realise something so large.

As the century progressed, and photography's capability advanced, industrial photographers were able to take their cameras into ever aspect of manufacture and construction. With advances in transportation, the progress of huge bridge projects was captured on glass plates, and some remarkable photographers came to the fore as a result. One such, Evelyn Carey (1858–1932), had the advantage of having been trained as an engineer, and epitomises a new breed of industrial photographer—one for whom engineering held little mystery. While many of the earliest photographers to turn their attention to industry had come from an art background, the emergence of the engineer-photographer gave the genre a greater sense of purpose.

Carey was an assistant engineer on the Forth Bridge project in Scotland, and was appointed in 1883, to record and chronicle every step in the construction of what was destined at the time to be the longest bridge in the world. Carey's understanding of engineering, married to his innate compositional skills, produced a body of work which is, in the annals of industrial photography, unrivalled to this day. Working with large format cameras and glass plates, often from the most precarious of camera positions either on girders high above the river or on caissons well below the water level, his stunning pictures still evoke a sense of awe. His use of workmen, as tiny ant-like figures seen in silhouette on the huge metal structure, initiated an approach to industrial and construction photography which would dominate the twentieth century. Like Delamotte decades before him, Carey had the task of recording every aspect of the project from start to finish. Like Delamotte before him, and generations of photographers after him, he created a body of industrial imagery that significantly enhances our understanding of our past.

NUNO PINHEIRO

See also: Bourne, John Cooke; Fenton, Roger; Gardner, Alexander; Great Exhibition, Reports of the Juries; Howlett, Robert; Langenheim, William and Frederick; Mudd, James; and Vignoles, Charles Blacker.

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INHA, INTO KONDRAD (1865–1930)

Finnish photographer, writer, and reporter

When K E Ståhlberg opened his photographic studio in Helsinki, Finland, in February 1889, he identified a potential market for selling pictures and engaged a few people to photograph the landscapes of Finland. The scheme was successful and one of his photographers, Into Kondrad Inha, not only contributed the best images but subsequently earned an international reputation because of his pictorial abilities.

Whilst working as a journalist, Inha had studied photography in Germany and Austria for a year, where he excelled in producing landscapes of the mountains and the rivers. When he returned to Finland in 1890, he had already decided to apply his new-found skills to his native country and a commission from Ståhlberg suited his aspirations perfectly. Inha consciously avoided adopting a sentimental approach to his work, and soon established an independent identity of his own—"He saw with his own eyes, in his personal way."

Inha was committed to capturing the technically perfect picture and would go to endless trouble. Although he was able to travel by train to some destinations, he frequently used his bicycle. To reach other locations, he paddled on the rivers and sailed the lakes; depending on the season, he would use skis, or simply walk through the forests with his photographic equipment.

To Inha, photography was an important means of expressing his feelings for Finland and he would search out the best composition, and then wait for the appropriate lighting. His writing abilities aided his photography by stimulating ideas for the way he could interpret and record a scene. It was important to document the landscape so that it fulfilled the commercial requirement but, in addition, Inha was anxious to capture the essence of a contemporary movement of national pride known as "Finnish-ness."

By careful composition, he found he could portray the vast landscapes, which are typical of the country. In the summer, he had long days with hours of sunshine, but the available daylight was reduced in winter and he had no guarantee of sunshine or weather that was suitable for pictorial photography. This was a characteristic of Finland, but Inha always made the most of the circumstances.

Inha experimented with cameras to secure the best equipment, and generally preferred a plate size of 18cm × 24cm, which was ideal for the subsequent albumen prints he favoured. Specialising in panoramas, he would often use several plates to record all the subject matter. Lacking the mountainous features of Germany, where he had trained, Inha concentrated on the expansive forests, the many lakes and rivers, and the deserted areas of wilderness in the north. Unless the sky was bright, and filled with attractive cloud formations, Inha's compositions would often concentrate on foregrounds in order to eliminate drab expanses of space above the horizon. Doing so allowed him to determine his exposure calculations for the important features of his photograph.

His coverage of the country was extensive, and like most Finns, he had a respect for exploring the wilderness. His wanderings on foot took him to otherwise inaccessible places beyond the Arctic Circle, and yet the trips which he undertook on the rivers of Kemi, Oulanka, Oulu and Kajaani provided the challenge of positioning his camera to capture dramatic waterfalls and fast-flowing white water. In wintertime, he composed his views so as to incorporate the ever-present snow—snow drifts, snow-capped trees, melting snow, and snow obliterating foreground rocks and other features.

He travelled to the northern cape of Hanko to photograph ice-breaking ships, and frozen rivers. He coaxed seal hunters into formal poses, and also documented them working on the ice. In western Finland, he secured images of wooden farmsteads and cabins, children at play, and fields of harvests. A summertime visit to Helsinki produced a portfolio showing fine architecture, urban life, the harbours, and the parks.

In following the tranquil lakes, waterways and canals of Eastern Finland, Inha took care to position human figures in his compositions, but also concentrated on the rural lifestyle—the sauna bath, women in the fields, travellers, and boatmen. He produced portraits by making the most of limited facilities—arranging small groups on a single bench to catch side lighting that enhanced their rugged features … even at the expense of shadow detail.

His personality was suited to the task. He had an artistic gift that was successful in photographing children and country people going about their daily lives. In the summer of 1894, he travelled to Karelia and produced a portfolio of over two hundred photographs that empathise with the subject matter. He managed to portray the poverty of the region by combining skilful selection and composition, which retained the dignity that was the essence of the people. He frequently adapted his style to improve his interpretation and because the coverage was so thorough, these plate negatives remain a national asset in the Finnish Museum of Photography, Helsinki.

He continued to modify his ideas and within two years he published *Pictorial Finland,* which was a definitive portfolio comprising nearly two hundred photographs. He took all the pictures for the specific purpose, and ever the perfectionist, Inha had the illustrations printed in Austria to reproduce the quality of the originals. During the summer of 1899, he continued to concentrate on rural scenery and received a commission to illustrate the distinctively Finnish aspects of agriculture for the Finnish Pavilion at the 1900 Paris Exposition.

He did a good technical job, but as his brief was to illustrate the emerging new styles of farming and to emphasise the increase in commercial forestry, it opened his eyes to the way in which Finland was changing. The rural ideal was disappearing and with it, a way of life. Finland was also experiencing political change and after an illness, Inha gave up newspaper work in 1908 and became a recluse. He continued to use his many cameras to good effect and found satisfaction by concentrating on some of details, rather than the full panorama, of the landscapes he cherished.

RON CALLENDER

Biography

Into Kondrad Inha was born on 12 November 1865. His father was a civil servant with the family name of Nyström, but a passion for all things Finnish probably encouraged Inha to change his surname some years later. Inha attended a Finnish-speaking primary school, and at home, his parents encouraged the creative activities of music, story-telling and painting.

In 1885, Inha enrolled at Helsinki University for geography, literature and studies in the appreciation of beauty, but a part-time job appealed to him so much that he abandoned university in preference for permanent employment in journalism.

Inha was a competent journalist and specialised in popular scientific texts and children's stories for over twenty years. For recreation, he cycled throughout Finland and parts of Europe, and his appreciation for the countryside provided inspiration for newspaper articles. After appropriate training, his strongpoint became pictorial photography, which he practised until he died in 1930.

See also: Finland.

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INNES, COSMO NELSON (1798–1874)

English photographer and professor

Cosmo Nelson Innes was born at Deeside in Aberdeenshire, Scotland, on 9 September 1798, the youngest of sixteen children. He attended the Royal High School, Edinburgh and the Universities of Aberdeen, Glasgow and Balliol College, Oxford. He was a member of the Edinburgh Calotype Club (c 1841–1856) and learned his photography in association with the other members of the Club. Photographs by him are in each of the extant albums of the Club: one in the Central Library of Edinburgh and the other in the National Library of Scotland. As well as the caloype process he is reported as also using the waxed paper process. His main subject matter was historic buildings. Lord Henry Cockburn, the judge, records in his Circuit Journeys that he was with Innes while he spent several hours "calotyping" the ruins of Pluscarden Abbey, near Elgin. He was one of the founders of the Photographic Society of Scotland in 1856 and his photographs were included in the Society's exhibitions. He served on its Council and as Vice-President and was still a member when the Society was disbanded in 1873. He became an advocate in 1822 and was Sheriff of Moray from 1840 until 1852. He had antiquarian interest outside the law, reflected in his choice of photographic subjects, and had a great knowledge of ancient, Scottish documents and was responsible for numerous publications. From 1846 until his death he was Professor of History at the University of Edinburgh. He died at Killin, Stirlingshire, on 31 July 1874 while on a tour of the Scottish Highlands. In 1826 he married Isabella Rose and had nine children.

RODDY SIMPSON

INSLEY, LAWSON (1851–1862)

Insley was an enigmatic daguerreian photographer active chiefly in the Pacific Region. He was probably the photographer Insley active in New Zealand from 1851–1853. The diary of Rev. Richard Taylor states Insley had traveled through India, America, New Holland, Van Diemen's Land and New Zealand. In 1851 he advertised plain or coloured daguerreotypes at Lambton Quay, Wellington. He is said to have taken portraits of Maori chiefs in Auckland. By 1853 he was working at 408 George St, Sydney, offering the only coloured daguerreotypes in Australia. He travelled through Goulburn, Braidwood and Queanbeyan during 1854 and 1855, marrying Margaret Cameron in Goulburn on 26 July 1855. He worked at a succession of Sydney addresses from 1856 and set up in 1859 in George St, Brisbane claiming to be the oldest established photographer in the colonies (this cannot be substantiated). He worked in Nicholas St, Ipswich in 1860, declaring insolvency in December but was back working in Brisbane from late 1861, then he went to Maryborough and Rockhampton in 1862. No trace is found of him after this although a son lived in Forbes, NSW and two daughters lived in Sydney. No definite connection with New York daguerreian Henry Insley has been established.

MARCEL SAFIER

Holdings: No original photographs located. An albumin print copy of a daguerreotype by Insley of Edward Hutchison and family in Queanbeyan is in the hands of descendants.

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INSTANTANEOUS PHOTOGRAPHY

An instantaneous photograph is one in which the length of exposure is short enough to freeze action. Instantaneity in photography is a relative term, the meaning of which changed repeatedly throughout the nineteenth century as a result of technological improvements. Initially, photographic emulsions were so insensitive that exposure times were seconds and even minutes long. At that speed, moving objects register only as a blur, or fail to register at all. Instantaneous photographs are ones in which the operator was able to accelerate exposure enough so that movement is captured. Although no precise definition of instantaneity exists, from the 1870s it came to mean pictures made more quickly than the naked eye can see. The term was widely used in the nineteenth century, but is now obsolete. It should not be confused with 'instantaneous' dye-sublimation processes (such as those manufactured by Polaroid), which are distinguished by the rapid creation of prints.

Instantaneity in photography was considered highly desirable in the nineteenth century. Many operators boasted of their ability to make 'instantaneous views' in advertisements and on their studio's printed mounts. In addition, instantaneous photography was a common category of competition in salon exhibitions. Nevertheless, early photographers were limited to only modest achievements. In an 1841 report before the French Academy of Science, the mathematician François Arago listed trees blowing in the wind, flowing water, the sea, storms, sailing ships, clouds, and jostling crowds as worthy instantaneous subjects. In the three decades that followed, other writers catalogued faster moving sub-

jects, including waterfalls, moving carriages, speeding trains, rising smoke and flames, flying birds, flapping flags, and galloping horses. Portraits were said to be instantaneous when the sitter was photographed without having to hold his or her pose for an uncomfortable period of time. Photographers renowned for their skill in instantaneous photography include some of the most celebrated praticioners of the medium, but also include many anonymous and little-known figures.

Photographers used a variety of techniques to achieve instantaneity in their pictures. The insensitivity of photographic emulsions was arguably the main obstacle to making instantaneous photographs. Consequently, improvements in chemical sensitivity and chemical accelerants were highly prized, and photographers sometimes jealously guarded successful formulas. Exposure times can also be shortened by increasing the amount of light entering the camera. Consequently, prior to the invention of electric lighting, portraitists designed their studios with large windows, reflectors, and skylights to make the most of ambient light. Outdoor subjects were chosen with careful attention to season, time of day, and the amount of light they reflected back at the camera. In one notable example, Eadweard Muybridge was known to have scattered white lime on the ground in order to increase illumination. Waves and clouds can be particularly bright subjects, and this is one reason many early instantaneous photographs depict them. Optics was another important consideration in making instantaneous pictures. Lenses with wide aperture were well suited to instantaneous photography. Short focal lengths were also successful because they transmit more light than longer lenses of similar manufacture. Accordingly, many of the best-known early instantaneous pictures were made with stereo cameras because these were usually equipped with simple, short lenses. In addition, this preference for short lenses meant that early instantaneous views tend toward a wide-angle, or 'fish-eye' appearance. The quality of lens was also important. Lenses made by the English firm J. H. Dallmeyer Ltd**.** were considered among the best for instantaneous photography. The rapidity with which the operator could cap and uncap the lens was another critical element. George Washington Wilson famously used his cap to control exposure; Captain Stuart Wortley used his bare hand. When these simple methods could not keep up, mechanical and electro-mechanical shutters were devised.

Techniques of less obvious merit were also used. Some instantaneous photographers shot scenes at a distance, as this caused the subjects they wished to capture to move less distance across the picture plane than they would have if taken close-up. This is why early street scenes are often made from considerable remove. Angle of view also had an effect, so that aerial perspective was frequently employed to increase the illusion of arrested motion. Photographers could also pan their cameras to try to keep the relationship between camera and subject constant. And, when all else failed, instantaneity was often faked. Many so-called instantaneous photographs were actually simulations, made using composite printing, creative posing of the subject, and manual retouching to give the appearance of an action shot.

Concern with instantaneity in photography is evident since the time of its invention. In correspondence between Louis Daguerre and Nicéphore Niépce in 1830, the two discuss their inability to create an instantaneous process, a quality they referred to as 'promptitude.' In his seminal *Pencil of Nature,* William Henry Fox Talbot cited his interest in capturing evanescent activity as one of his motivations for inventing the paper negative process. He described photographs of such subjects as 'fairy pictures, creations of a moment.' Writing in the *Photographic News* in 1860, John Herschel suggested that photography might one day be used to record 'the vivid and lifelike reproduction and handing down to the latest posterity of any transaction of real life—a battle, a debate, a public solemnity, a pugilistic conflict, a harvest home, a launch—anything in short, where any matter of interest is enacted within a reasonably short period of time.'

Given their positions as centers of technical innovation, instantaneous photography flourished in Britain and France. Photographers in these countries excelled in the production of seascapes, which were among the first widely admired instantaneous subjects. Gustave le Gray's photographs of the sea near the Mediterranean port of Sète in the late 1850s were praised for their effectiveness in showing rippling and crashing waves, sailboats moving at speed, and clouds. Eugène Collau was also highly regarded for his photographs of racing sailboats, and Jean Victor Warnod was lauded for images of travelling steamships with columns of smoke rising from their smokestacks. Edmond Bacot's apparently unique photograph of waves crashing behind a row of bathing huts in Boulogne (Société Française de Photographie), taken in 1850, has become one of the icons of early instantaneous photography. In Wales, John Dillwyn Llewelyn photographed turbulent seas in the early 1850s, with the noteworthy inclusion of standing figures at the shore. George Washington Wilson's 1859 views of the Loch of Park, in Scotland, were ahead of their time, capturing rowers plying their craft at sunset. Other notable British seascapists were Charles Breese**,** who made collodion on glass stereo slides in the early 1860s of moonlight effects at sea, and Captain Stuart Wortley**,** who made sumptuous images featuring intricate renderings of clouds.

French photographers excelled in the arena of instantaneous family portraits and genre scenes. Jean

Baptiste Frenet's unusual collodion transfer process seems to have been particularly effective in capturing motion, enabling him to portray natural behaviors such as a child's yawn in the mid 1850s. Working just a few years later, Charles Nègre photographed workers and inmates at the Imperial Asylum at Vincennes. His precocious photographs of people and events on the streets of Paris foreshadow reportage images of the 1920s. Louis-Jean Delton's photographs of clowns in the 1860s convey the spontaneity of a circus act, while Adrien Tournachon's contemporaneous tableaux of street performers, and particularly of the Mime Debureau in the role of Pierrot, depict the nuances of gesture and facial expression.

Scotsmen John Adamson and the duo of David Octavius Hill and Robert Adamson anticipated instantaneous genre photography in their well-posed pictures of soldiers and fishwives made in the early 1840s. Using a collodion on glass negative process, compatriot Charles Piazzi Smyth made a remarkably personal series of photographs of Russian soldiers in the squares of Novgorod around 1857. Geoffrey Bevington managed to produce convincing photographic illustrations of workers engaged in their occupations in the 1860s. However, it was in street photography that British photographers were best known. A friendly transatlantic rivalry emerged between George Washington Wilson and the American Edward Anthony**.** Unknowingly at first, the two echoed each other's work in street scenes made in their respective cities of Edinburgh and New York City. The market for instantaneous stereo cards blossomed in the 1850s and 60s. In England, Valentine Blanchard and William England developed large catalogues of instantaneous stereo views. Their efforts were echoed modestly by Giorgio Sommer in Naples and Carleton Watkins in San Francisco, while Ernest Lamy**,** Gustave Laverdet**,** and Auguste-Adolphe Bertsch recorded bustling foot traffic on the streets of Paris.

Instantaneity was particularly important in the field of animal and zoological photography. The unpredictability of animal subjects made apparently simple photographs of animals difficult to execute: pictures of birds such as those made in nature by John Dilwynn Llewelyn and those made at the London Zoo by Count de Montizon in the 1850s were largely confined to species with stalking behaviors such as herons, cranes and egrets. Numerous photographers specialized in animal subjects, notably Louis-Jean Delton, Léon Crémière, and Frank Haes. However, technological limitations affected what could be photographed naturally, so that in some cases animals were actually stuffed and arranged in dynamic poses. Louis-Pierre-Théophile Dubois de Nehaut's unparalleled photographs of the elephant Betsy taken in 1854 at the Brussels Zoo are one notable exception.

By the 1870s, interest in producing truly instantaneous photographs of animals in motion resulted in landmark experiments in the United States and Europe to photograph a horse while galloping. These proved decisive in the history of instantaneous photography. In France, the physiologist Etienne-Jules Marey initially used non-photographic means to attempt to determine the gait of a running horse. This met with only modest success; the results were difficult to verify because the human eye cannot see fast enough to judge the position of all four legs of a running horse. In California, expatriate English photographer Eadweard Muybridge was hired by former Governor Leland Stanford to analyze the gaits of horses at his ranch in Palo Alto California in 1872. The purpose of Muybridge's work was to determine whether a horse ever has all its hooves simultaneously off the ground at some point in its stride. Although he reported modest success using photography to settle the question in 1873, the pictures he produced then were never published and are not preserved. Muybridge's project was interrupted by unfortunate developments in his personal life, but resumed with Stanford's financial backing in 1877. At that time, using a specially designed track and a battery of cameras with automatic shutters, Muybridge produced sequential instantaneous photographs of unprecedented speed. When published, they inspired Marey to dedicate himself to his own equine experiments using photography. Using Muybridge's accomplishments as a point of departure, Marey developed numerous innovative methods for making a sequence of instantaneous photographs on a single photographic plate, and extended his experiments to other animals, notably humans and birds. Muybridge, too, photographed a range of animals including dogs, goats, deer, and oxen.

The advent of gelatin dry plate photography in 1878 greatly facilitated the production of instantaneous photographs. Ottomar Anschütz in Prussia, mindful of the photographs of his contemporaries, produced stunningly detailed individual instantaneous pictures in the 1880s, some of which he assembled into grid-like sequences reflecting Muybridge's sequential method. His work, together with that of others, such as the Hungarian Bertalan Székely and the Frenchman Albert Londe**,** transformed the instantaneous photography movement, bringing metric precision and scientific protocol to bear on photographic picture making. This new generation of photographers created a distinct but loosely organized movement known as chronophotography.

Instantaneous photography effectively ended with the rise of chronophotography, but its legacy was long lasting. The desire to make instantaneous photographs greatly influenced composition and subject matter in photography's first four decades. Perhaps more importantly, the notion that photography could see what the human eye could not closely paralleled the medium's

acceptance as an objective tool. As photography became capable of recording increasingly narrow slices of time, it grew in versatility and status. Ultimately audiences came to understand that photography was capable of making pictures far more penetrating than traditional media such as drawing, painting, and printmaking. Instantaneous photography—and with it, the ability to make images of fleeting and ephemeral subjects—became a central element of photographic aesthetics.

PHILLIP PRODGER

See also: Muybridge, Eadweard James; Camera Design: Stereo Cameras; Dallmeyer, John Henry & Thomas Ross ; Wilson, George Washington; Stuart Wortley, Henry Archibald; Daguerre, Louis-Jacques-Mandé; Niépce, Joseph Nicéphore; Talbot, William Henry Fox; Herschel, Sir John Frederick William; le Gray, Gustave; Bacot, Edmond; Llewelyn, John Dillwyn; Frenet, Jean Baptiste; Nègre, Charles; Tournachon, Adrien; Adamson, John; Hill, David Octavius, and Robert Adamson; Piazzi Smyth, Charles; Anthony, Edward, and Henry Tiebout; England, William; Blanchard, Valentine; Sommer, Giorgio; Watkins, Carleton Eugene; Bertsch, Auguste-Adolphe; Animal and Zoological Photography; Llewelyn, John Dillwyn; Haes, Frank; Dubois de Nehaut, Chevalier Louis-Pierre-Theophile; Marey, Etienne Jules; Anschütz, Ottomar; and Londe, Albert.

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INTENSIFYING

In 1867, *Photographic News* deplored the practice of intensifying under-exposed negatives. "We disapprove … we consider it bad practice …," stated an editorial which argued that correct exposure produced the perfect negative, and "all those harsh black and white specimens" would be eliminated. Nevertheless, uncertainty in exposure encouraged a search for treatments to retrieve thin negatives. Intensification increased the effective sensitivity of the camera material, and was applied to daguerreotypes, collodion plates and dry plates.

The Becquerel effect was found to be suitable for improving underexposed daguerreotype plates. In 1840, after re-exposing plates to yellow and red light, Edmond Becquerel had found that he could strengthen the original image by development with mercury, although Claudet found that the benefit was restricted to plates of silver iodide.

Frederick Scott Archer favoured a bleaching method whereby the silver image of a processed collodion negative was treated with mercuric chloride, which formed a white precipitate and strengthened the image-forming deposit.

Adjusting the colour of the negative would often improve its actinic properties in printing. In 1865, Herman Selle mixed potassium ferricyanide and uranium nitrate to produce a brown colouration and although effective, no further research was done for ten years, when a precipitate (of silver ferrocyanide and lead ferrocyanide) was "blackened" in a dilute solution of ammonium sulphate. Because such treatments were often applied out of necessity, the ensuing print quality was poor and of excessive contrast.

By 1861, intensifying was better understood, allowing the developed image to be modified after drying. The formulas claimed to have influences on tonality and contrast, with preferential action in the shadows, and some, such as chromium intensifier, also darkened prints.

With gelatine emulsions, intensification remained a darkroom procedure when developing plates with insufficient density. There were different methods, each with a "printing value." For example, chromium would bleach the negative for re-development to a value of 1.5, whereas a mercuric chloride bleach, followed by redevelopment in ferrous oxalate, improved the printing value 2 times. Solutions containing mercuric iodide, lead, uranium, copper bromide were widely used, but the most popular were the mercurial processes, with values of 3.

Once dry plates were established, two non-chemical ways of intensifying the latent image emerged. William Blair had proposed a technique in 1869 which ensured "acceleration of exposures" by demonstrating that, before development, the latent image could be re-exposed to diffuse light, to give "these first and weak impressions just that addition which is necessary to let the developer get hold of them, and carry them forward to a visible impression." Blair was aware that

most means of improving "sensitiveness" had already "been pushed to the limit," but as latensification, the strategy remained popular in the 20th century. Inspired by favourable comments, Blair later proposed a variant whereby a controlled amount of light was admitted to the plate before the camera exposure; that is "hypersensitisation." Blair reported increased "acceleration," but with prescience, he warned his results only applied to "comparatively short exposures. With long exposures, other changes take place."

RON CALLENDER

See also: Becquerel, Edmond Alexandre; Claudet; Archer, Frederick Scott; Dry Plate Negatives: Gelatine; Dry Plate Negatives: Non-Gelatine, Including Dry Collodion; and Blair, Thomas Henry.

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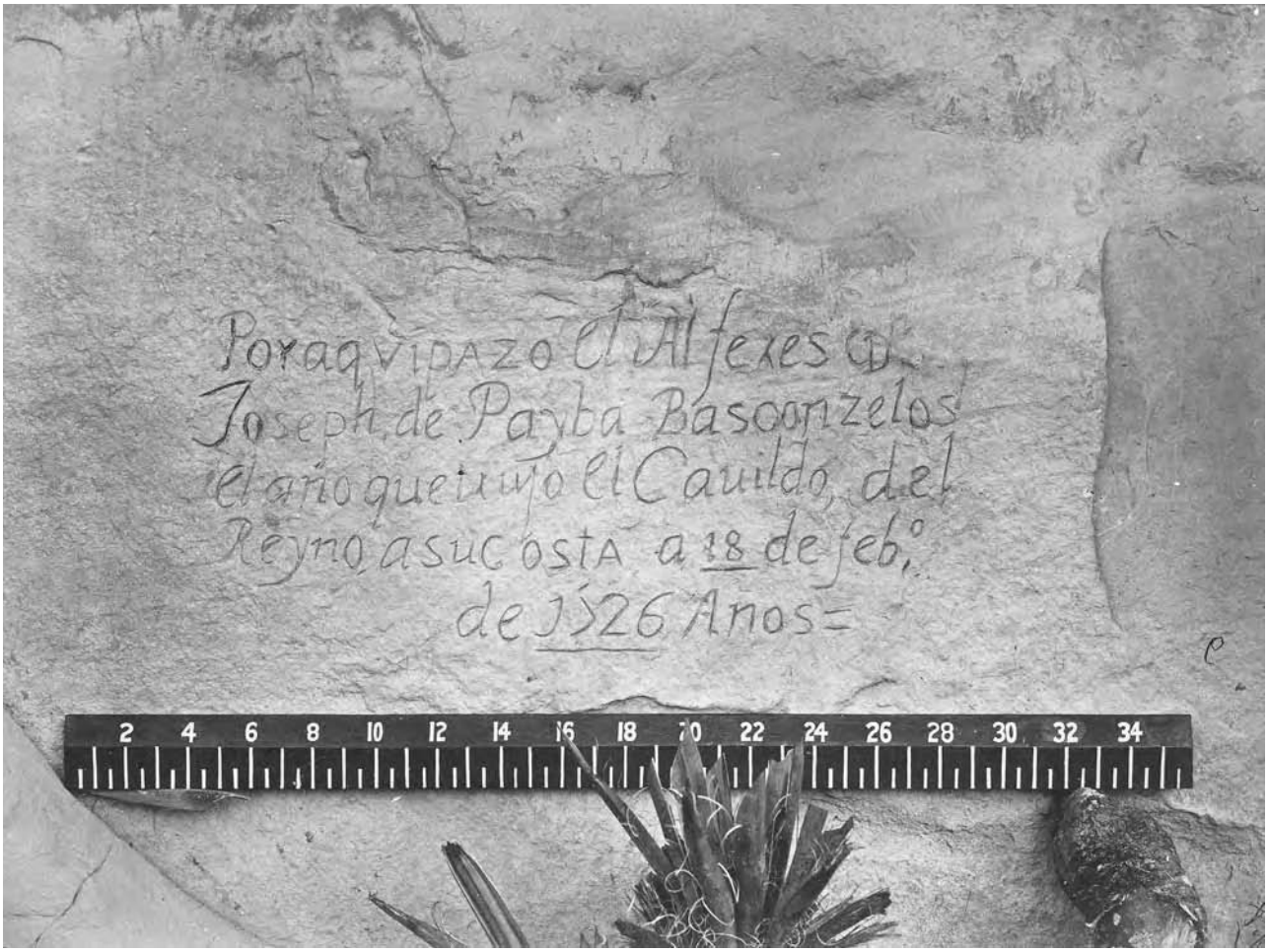
IRELAND

Photography in Ireland developed quite rapidly due to the fact that although Richard Beard did take steps to patent the daguerreotype in Ireland (Irish Patent, No 229, April 1841), he seems never to have enforced his rights. On September 20th 1839 the *Belfast Newsletter* published a letter by the engraver Francis Stewart Beatty (1806–1891) describing specimens of his successful attempts to replicate Daguerre's invention. Beatty's letter is the first published account of photography in Ireland and he went on to work as an operator in Richard Beard's London Polytechnic Institution in 1841 before returning to Belfast to establish a portrait studio in Castle St. in 1842. Beatty continued to have a long association with photography designing his own collodion wet plate field camera in 1858 and along with Dr. Thomas Alexander taking out a patent for photo-lithography in 1860.

In 1840 instruction in the use of the daguerreotype was offered by the Dublin Mechanical Institute and the Natural Philosophy Committee of the Royal Dublin Society purchased a camera for taking daguerreotypes in the same year. A studio established in the Rotunda on Dublin's Sackville St. (O'Connell St.) in 1841 is likely to have been opened by Beard in an attempt to protect his licence purchased from Daguerre. In April of 1842 this studio was taken over by Le Chevalier Doussin Dubreuil and throughout the decade a number of commercial studios appeared throughout Dublin including one opened in 1845 by the self proclaimed Professor of Natural Philosophy, Leone Gluckman. Although there was less commercial activity in other Irish cities during the 1840s a number of studios opened in Belfast including one by a photographer with the surname of Cherry and in Londonderry Robert McGee operated a studio until 1843. In the late 1840s Edward Harding opened a studio in Cork city and in Athlone a self-proclaimed professor of the Daguerreotype, D. Lewis Davis opened a studio in 1847. Although commercial photography continued to expand during the 1850s with studios opened in Belfast, Dublin and Cork it wasn't until the 1860s that commercial photography became fully established throughout Ireland. The longest surviving commercial company was established in 1853 by the Lauder Brothers on Dublin's Capel St. In 1880 James Stack Lauder established the Lafayette studios on Westmoreland St. in the city before opening other Lafayette studios across the rest of Britain. The Lafayette name still exists as photographic studio in Dublin today.

Photography was also quickly taken up by Ireland's professional and landowning classes, many of whom were introduced to photography through scientific and educational connections with Britain. William Holland Furlong from Dublin was introduced to photography at the University of St. Andrews in 1840–41 as was William Despard Hemphill from Clonmel Co. Tipperary who studied medicine there before returning to Ireland in the mid 1840s. Hemphill went on to win a number of prizes for his photographs at exhibitions in Britain and France and published stereoscopic books in 1857 and 1860 of subjects in and around the town of Clonmel. Louisa and Edward King Tension of Kilronan Castle Co. Roscommon purchased a licence from William Henry Fox Talbot and produced many calotypes of topographical subjects throughout the 1850s and Hugh Annesley, a junior officer in the British Army from Castlewellan Co. Down produced photographs of subjects in Ireland and South Africa from 1851–1880. Other early Irish amateur photographers travelled abroad to take photographs, most notably the wealthy Cork landowner John Shaw Smith who produced over three hundred calotypes during a Grand Tour of Italy, Greece and Egypt in 1850–51. A number of Irish soldiers established themselves as commercial photographers in the colonies, including a young private in the Royal Artillery from Co. Wicklow John Burke who opened a studio with William Baker in Peshawar, India in 1861.

Photography was popular amongst the residents of Ireland's big country houses throughout the nineteenth century. Of particular note are Mary Parsons and her husband William, 3rd Earl of Rosse, Birr, Co. Offaly. Lord Rosse, President of the Royal Society was closely associated with William Lake Price who together per-



O'Sullivan, Timothy. Historic Spanish Record of the Conquest.
The Metropolitan Museum of Art, Purchase, The Horace W. Goldsmith Foundation Gift, 1988 (1988.1064) Image © The Metropolitan Museum of Art.

suaded Fox Talbot relinquish his patent rights of the calotype process. Lord Rosse experimented with the daguerreotype as early as 1842, and in 1853 corresponded with Talbot regarding his attempts to produce calotypes of the moon through The Great Leviathan then Europe's largest telescope. However, it is his wife Countess Rosse (1813–1885) who became the more celebrated amateur photographer becoming a member of the Royal Photographic Society in 1853, the Dublin Photographic Society on the 3rd December 1856 and was elected a member of the Amateur Photographic Association on the 13th March 1863. The Dublin Photographic Society, which changed its name to the Photographic Society of Ireland in 1858, held its first meeting at Leinster House on November 8th 1854 and organised the photographic sections of the Royal Dublin Society's annual Arts and Manufacturers exhibition. At this exhibition in 1859, Countess Rosse was awarded a silver medal for best paper negative by the Dublin Photographic Society and exhibited her photographs at the Dublin International Exhibition of 1865. Other significant amateurs are Sir Joscelyn Coghill (1826–1905) who won a prize for photography at the Paris Exhibition of 1863 and Gerald Dillon and his wife Augusta Crofton Dillon of Clonbrock House Co. Galway.

Inventions relating to photographic processes also appeared throughout the century in Ireland. Dr. Thomas Woods presented a paper on his 'catalystype process' on May 12th 1845 to the Royal Irish Academy, resulting in correspondence between RIA and Fox Talbot who claimed there was little difference between the process and his patented calotype. The miniature portraitist Bernard Mulrenin (1803–68) presented a paper in April 1859 to the Royal Dublin Society and the Photographic Society of Ireland claiming to have devised a process of transferring the image-bearing emulsion of the wet plate negative onto marble or ivory rendering the image similar to miniature paintings. Ireland's most significant contribution to the science of photography came from the Trinity professor John Joly (1857–1903) who patented the first single-image colour photography process in 1894.

During the closing decades of the century, much commercial photography was geared towards tourism, with firms such William Lawrence's *Great Bazaar and Photographic Galleries,* opened on March 20th 1865 at 5–7 Upper Sackville St. in Dublin and destroyed during the 1916 Easter Rebellion, producing stereoscopic views, postcards and picture books for the tourist market. Portraits of political figures involved in Irish nationalism such as the Fenians were also popular as *carte-de-visite* and cabinet card series as were photographs of other political events.

During the last years of the century many amateur societies involved with ethnography, antiquities, archaeology and natural history established photographic clubs to document their activities. Commercial photographer Robert John Welch (1859–1936) from Belfast was an active member of the Belfast Naturalists Field Club and photographed many botanical, topographical and ethnographic subjects during their field work. Many of these organisations used photography to document aspects of Irish culture as part of the Gaelic Revival and the county's leading antiquarians, folklorists and ethnographers were also keen amateur photographers at the turn of the century.

JUSTIN CARVILLE

See also: Talbot, William Henry Fox; and Royal Photographic Society.

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ISENRING, JOHANN BAPTIST (1796–1860)

Swiss daguerreotypist

An artist, engraver and early daguerreotypist—both amateur and professional—Johann Baptist Isenring introduced several early developments in photography. Born in Sankt Gallen, Switzerland, in 1796, he became interested in the daguerreotype almost as soon as the process was announced, ordering his first outfit direct from Paris before the end of 1839, and had produced photographs of his home town by the end of that year. In the following year he took portraits of his family and friends, enjoying relatively short exposures due to the clarity of the mountain air, and the enhanced levels of ultra-violet light at altitude.

Isenring opened a portrait studio in Munich in 1841, pioneering his own process for the colouring of daguerreotype portraits, with a technique for applying pigment and gum acacia to the surface of the plate. Either introducing colour with a brush, or dusting it on to the surface through cut-out masks, his technique involved the adhesion of the gum and pigment mixture by breathing on the plate surface.

British Patent No.9292 issued to Richard Beard in 1842, and entitled 'Colouring Daguerreotype Pictures' was based on Isenring's method, the Swiss photographer's process being acknowledged only indirectly as 'communicated to me by a certain Foreigner residing abroad.'

JOHN HANNAVY

ITALY

After François Arago's report to the Académie des Sciences in Paris on 7 January 1839, that Jacques Louis Mandé Daguerre (1787–1851) had succeeded in fixing camera obscura images, the news of his discovery was received immediately and spread in the capitals of the various Italian states by the most important journals and scientific publications. In the centres in which cultural matters were most hotly debated—Milan, Turin, Venice, Bologna, Genoa, Naples, Rome—both experimental and professional photography was enthusiastically taken up by operators from the most diverse backgrounds like optics, chemistry, painting and engraving. Publications like "La Gazzetta privilegiata di Milano," "Il Politecnico," "Messaggere Torinese," "Gazzetta Piemontese," "Lucifero" and "Poliorama pittoresco," described and discussed the discovery of the daguerreotype process well before 19 August 1839, the date when, at Daguerre's side, Arago (1786–1853) finally revealed the formula of the new invention at the joint meeting of Academy of Sciences and the Academy of Arts in Paris. In the capitals of the pre-union Italian states, Daguerre's manual (Paris: Alphonse Giroux, 1839) was published in

French and Italian (Genoa: A. Beuf, 1839; Bologna: tip. Nobili e c., 1839; Rome: A. Monaldi, 1840). Moreover, the first experiments were carried out: on 2 September in Florence; on 8 October in Turin; in Pisa at the First Congress of Italian Scientists from 1–15 October, thanks to the physicist Tito Puliti**,** in Milan on 30 November; in Naples on 28 November and 15 December. The daguerreotype process immediately found favour among the bourgeois, who were attracted by the possibility of producing images which were faster and less costly than painting and engraving. At first, there were many foreigners who travelled around Italy doing daguerreotypes, in particular, the Frenchmen Alphonse Bernoud, active from 1840 to 1872 ca. in Genoa, Florence and Naples and Perraud, active from 1840 to 1846 ca. in Lombardy—Veneto, Turin and Rome. There was the Parisian Adolphe, active in the 1840s; Meissner, Stenzel, Joseph Renaud (1809–1860 ca.) and Fortin were mainly active in Turin. Very soon, the Italians were working side by side with the French in using the daguerreotype process: Ferdinando Brosy in Lombardy—Veneto, Trento and Trieste; Enrico Federico Jest in Turin; Alessandro Duroni (1807–1870) in Milan; Antonio Sorgato in Venice; Lorenzo Suscipj, Angelo (1793–1858) and Giacomo (1819–1891) Luswergh in Rome.

The daguerreotype process captured the imagination of the artistic and scientific world, and raised a far-reaching debate on its characteristics and potential. The bourgeois *élite*—culturally speaking, the most vital and committed protagonists of the Italian Risorgimento—were the ones to pick up on the significance of photography as a new, extraordinary means of communicating and learning. It is sufficient to mention Macedonio Melloni's passionate report: *Relazione intorno al dagherrotipo, letta alla Regia Accademia delle Scienze di Napoli nella tornata del 12 Novembre 1839*. This physicist and patriot went into exile in Paris after the tumult in 1831. His report was one of the most important scientific announcements published in Italy in the early days of photography. The debate on Italian scientific developments held at the Congress of Scientists in Pisa in October 1839 was also important and significant. Among the main themes addressed by the four hundred delegates at the Congress were the liberalization of trade among the different Italian states and the development of the railway network, indispensable premises for the development of a common market. In this context, photography was presented through experiments that aroused wonder and interest in onlookers, and this confirms how rapidly the novelty of the invention was received, with its way of meeting the demands of representation and self-representation of the rising middle classes.

The "genres" that the daguerreotype process inherited from its predecessors in the visual arts were the view and the portrait. Views respected the linguistic codes of painting and engraving, and were clearly derived from the rules of Renaissance perspective in the symmetrical layout and central positioning of the image. Among the most important collections of Italian daguerreotype views are the 159 daguerreotypes housed in the Science Museum in London. They were commissioned by the English philologist Alexander John Ellis (1814–1890) from different photographers, among whom were Lorenzo Suscipj and Achille Morelli. The collection of John Ruskin, now in Lancaster University, is also significant. Of course, favourite subjects were the most typical monuments in Italian cities, arranged in a visual itinerary that isolated and exalted these works as *topoi* of cultural and artistic identity.

There were many attempts to turn daguerreotype plates into plates for engraving. The best results were obtained not so much by engraving the daguerreotypes as by transferring the design manually to the plates, as in the well-known series of Italian views in *Excursions daguerriennes, vues et monuments les plus remarquables du Globe,* published by Lerebours in Paris in 1842, and the series of aquatints entitled *Vues d'Italie d'après le daguerréotype*, published in Milan between 1840 and 1842 by Ferdinando Artaria (1781–1843). These initiatives in the world of publishing, a prelude to the modern illustrated guide, were aimed at educated bourgeois tourists, who, in fact, preferred this type of product because it was less expensive than traditional engravings. It was also easier to carry because of its small format.

After 1842 it was possible to do portraits in the daguerreotype process since, thanks to the introduction of new lenses and faster chemical processes, posing times were reduced. Portraits done in this way had these unquestionable advantages: clear, precise details (as in the views); a work that was as precious and unique as a portrait in oil or a miniature, but definitely at a much lower cost. Among the Italian daguerreotypists who are worth mentioning: Alessandro Manzoni's stepson Stefano Stampa (1819–1907), who did beautiful portraits of the members of his family; Antonio Sorgato, author of numerous refined portraits; Alessandro Duroni, optician and founder of one of the first *ateliers* of photography. From this period onwards, photography studios began to be organized according to different professional fields, among which was portrait retouching, often carried out by ex-miniaturists.

In the first years of the 1840s, the calotype process began to spread throughout Italy, but with less success than the daguerreotype process. The technique introduced by W. H. Fox Talbot (1800–1877) had resolved the problem of doing images in series with the introduction of a printing process from a single negative. With respect to the daguerreotype, however, the calotype was thought to have less definition, mainly because of the graininess

and opacity of the paper used for the negatives. With the improvements introduced by L. D. Blanquart-Evrard (1802–1872) and Gustave Le Gray (1820–1882), it was possible to produce paper negatives with more precise details while maintaining the half tones, which painter-photographers liked so much. This technique was widely used for views, in particular, monuments, archaeological sites and landscapes. Above all, travellers appreciated the technique because the materials it required was light and easy to carry; they could also be prepared many months beforehand. Among non-Italians worth mentioning are Calvert Richard Jones (1804–1877), George Wilson Bridges (1788–1863), William Robert Baker (1810–1896) and Edouard Delessert (active in Sardinia in 1854). The photographers of the "Roman School of Photography," in particular Giacomo Caneva (1813–1865, from Padua), Frederic Flachéron (1813–1883 ca.) and Eugéne Costant excelled in the calotype process. Together with Giron des Anglonnes and Alfred—Nicolas Normand (1822–1902), they were among the first Roman calotypists who, integrated into the cultural milieu of the 1850s, made Rome an international capital. The Caffè Greco or the French Academy in the Villa Medici were among the places where photographers, artists and intellectuals most frequently met to exchange opinions, news and experiences. This special climate encouraged the development of photography; in fact, there was an extraordinary production of views and monuments of the papal capital and the vicinity. The first systematic campaigns to photograph works of art were undertaken: it is enough to cite Giacomo Caneva's shots of the statues in the Capitoline and Vatican Museums, among which are the famous images of the *Laocoonte* and the *Torso del Belvedere*. In Rome, we should also mention the work of Stefano Lecchi (1805–1860 ca.), author of numerous views of monuments and the first reportage of a war event, the clashes in Rome for the defence of the Republic in 1849. Lecchi, from Lombardy, took shots on site and then printed them as salted papers. He went to all the scenes of conflict, and often had soldiers pose in them for greater effect. His views, recently rediscovered and studied, constitute one of the first examples of a series of photographs dedicated to current events, and came before the series Roger Fenton did in 1855 on the Crimean war. However, the people involved in the action could not yet be photographed as it was happening, but only later, and so the images are full of an expressive force, often retouched by hand in the foreground with the insertion of figures to make up for the lack of action.

In the Lombard–Veneto area, the work of Luigi Sacchi (1805–1861), painter, engraver and then photographer, deserves special mention. After a period of training in the Accademia di Belle Arti di Brera in Milan and experience as a lithographer and wood engraver (he got a prestigious commission as editor in chief of the illustrated edition of Alessandro Manzoni's *The Betrothed* which came out between 1840 and 1842), he chose the calotype process. He depicted the most famous monuments which represented the many centuries of Italy's artistic tradition. His views, part of which were collected in the *Monumenti, vedute e costumi d'Italia* series published between 1852 and 1855, are the work of a passionate photographer, driven by the intention to do a true visual catalogue of Italy's artistic and natural beauty. His intellectual vitality also came out in the journal *L'Artista. Rivista enciclopedica di belle arti, di scienze applicate all'industria, di fotografia, di archeologia e di viaggi scientifici*, of which he was editor and publisher in 1859.

In the fifties, important technical texts on photography were published in Italy. Apart from the treatise Giacomo Caneva's *Della fotografia* (1855), which focused on the calotype process, *Il Plico del fotografo* by the multifaceted, cosmopolitan Giuseppe Venanzio Sella (1823–1876) from Biella came out the following year. A chemist and wool manufacturer, Sella dedicated himself to photography after a period in Paris, and rapidly achieved remarkably high quality results. He experimented with the new wet collodion technique, and became one of the most distinguished figures in the sector.

The daguerreotype and calotype processes co-existed in the photographer's daily routing until around 1860. At the same time, together with the collodion process, the albumen print became widespread in Italy, until the first years after the First World War. From about 1860 onwards, along with the economical, political and social evolution of the bourgeois at the threshold of the unification of Italy, photography became more and more widespread as mean of representation. This success became even more pronounced once unification had come about, encouraged as it was by the cultural context of the second half of the XIX century. The rise of positivism had in fact had deposited fertile terrain for scientific and technological development. All scientific innovations, and hence, photography, were received as signs of humanity's unrestrainable progress. In this period the first Italian journal entirely dedicated to photography, *La Camera Oscura* was founded in 1863 in Milan by Ottavio Baratti. After various ups and downs, publication was stopped after 1894.

The great photography *ateliers* were born, either from previous firms founded by the pioneers of photography at its origins, or on the initiative of new professionals—photographers who had acquired the technical, expressive, cultural and managerial know-how thanks to their travels abroad. The training of this new group was no longer linked to particular, restricted fields like optics or miniatures, but to vaster sectors, above all, engrav-

ing. The advantages of this new technique that brought together the positive aspects of the daguerreotype and calotype processes made it possible for the first time for photography to become a viable alternative to other techniques of reproduction. Engraving, of course, was the medium that paid most dearly when photography became more widely diffused. Photography was already in great demand by tourists and travellers because it cost less and was easier to transport, as is evident from the numerous documents issued by the Calcografia Camerale, the Roman institute which was in charge of the production and sale of engravings when the papal state still existed.

Photography studios in different Italian cities developed different specialities, and were especially oriented towards the three genres of portraiture, views and art reproductions. Among the most important professional photographers were: in Rome, the D'Alessandri brothers, Antonio (1818–1893) and Paolo Francesco, Gioacchino Altobelli (active from 1847 to 1878 ca.), Pompeo Molins (1827–1893 ca.), Tommaso Cuccioni (active from 1830 ca. to 1864), James (1813–1877) and Domenico (1854–1938) Anderson, Robert Mac Pherson (1811–1872), Romualdo Moscioni; in Florence, the Alinaris (active from 1854 to the present day), Giacomo Brogi (1822–1881), Pietro Semplicini; in Turin, Michele Schemboche (active from 1860 to 1906 ca.), Luigi Montabone (active from 1860 to 1877), Henri Le Lieure (1831–1914); in Milan, Pompeo Pozzi (1817–1880), Giulio Rossi (1824–1884), Alessandro Duroni, Giovan Battista Ganzini (1838–1878); in Bologna, Pietro Poppi (1833–1914); in Trento and in Trieste, Giovan Battista Unterverger (1834–1912); in Venice, Carlo Naya (1816–1882), Carlo Ponti (1822 ca.–1869), Domenico Bresolin (1813–1899), Antonio Perini (1830–1879); in Naples, Giorgio Sommer (1834–1914), Robert Rive; in Genoa, Alfred Noack (1833–1896); in Palermo, Eugenio Interguglielmi (active from 1860 to 1900 ca.) and Giuseppe Incorpora (active from 1860 to 1898 ca.); in Verona, Moritz Lotze (1809–1890).

Among the activities of the most renowned firms cited above, there was ample space for the reproduction of works of art and monuments most representative of the art historical tradition and natural beauty of Italy. Nature was not only seen as such, but as an integral part of the landscape, and essential element of a whole in which nature and history, culture and nature harmoniously balanced and completed each other. The wide range of production in this field was conditioned by the requests of the patrons, most of whom were upper middle class and aristocratic tourists from the different parts of Europe. Views of archaeological sites like Pompeii, Paestum and Herculaneum, of the classical ruins of Magna Grecia and ancient Rome, of medieval and Renaissance cities or of the *palazzi* and *calli* of Venice—to cite only a few places—were included in the catalogues of the major photography studios of the period. These images contributed to the creation of true visual *topoi* as well as to the diffusion of a certain image of Italy throughout the world, an Italy that could be identified by its treasures and incontestable art historical supremacy. The language through which photography more or less consciously expressed itself shows multiple influences from previous artistic traditions. This is especially evident in the adoption of the same perspective and compositional schemes from the historic-stylistic legacy of engraving. The main Italian museums (the Uffizi in Florence, the "Pinacoteca di Brera" in Milan, the "Galleria dell'Accademia" in Venice, to cite a few) began to be interested in extensive campaigns to photograph the works they owned. Thus, the collections at the base of future museum photo archives were created; series of different artistic objects came out in special rare editions. In the view genre, the large format prevailed. In editorial production for the public at large, the small stereoscopic format, especially for views, architecture and statuary was popular. Since this format was created to be viewed in three-dimensions, the stereoscopic photograph preferred the subjects that best suited it, thus enhancing its spectacular effect.

Florence witnessed the rise of what would become the main Italian photography firm specializing in the reproduction of works of art, Alinari, founded in 1854 by the brothers Leopoldo, Giuseppe and Romualdo. Leopoldo Alinari, (1832–1865) who had had his earliest experience in the field of engraving, defined the cultural and economical strategies of the agency, which soon carried out systematic photographic campaigns throughout the national territory. In the course of their long career, the Alinaris published numerous catalogues of views divided by region and place, thus showing how they wanted to produce a true visual "catalogue" of the whole of Italy. Among their first images were those published by Eugène Piot in the work *L'Italie monumentale* (1851), a milestone in publishing in France and the entire world, as well as one of the first cases in which the illustrated part is made up of photographs and not of engravings. The Alinaris were called to all the most important exhibits of the age. They got prestigious commissions, among which are the works they did to reproduce the drawings of Raphael in Florence, Venice and Vienna, his frescoes in the Vatican Apartments and the frescoes in the Sistine Chapel in Vatican. The Alinari views were shot using the central, symmetrical layout typical of Renaissance perspective, thus offering a view in which the monument was generally isolated, as a unique, exclusive testimonial to artistic creation. The Alinari images played a fundamental role in the perception and knowledge of the Italian work of art. This became especially clear at the end of the nineteenth

century, when great art historians like Adolfo Venturi introduced the use of photography in the study of art and when the fundamental texts in this sector were illustrated with photos that mainly came from the Alinari studios. Knowledge of the great works of painting and sculpture also became widespread through the carbon print, chosen by Alinari in the 1860s because of the stability of the image, the refined rendering of the tones and shades and the possibility of using coloured pigments to adapt to the different media of the artistic works represented. An Alinari 'style' thus came to be recognized in the monument view genre, and had a great influence on the other contemporary photographers who were working in the same genre.

Another firm working in Florence was the one founded by Giacomo Brogi, who specialized in portraits as well as views and works of art. Brogi's views always showed the monument within the urban and social fabric, thus capturing it in its context and historical dimension, not separated from time and space. Brogi's portraiture adopted the formulas of the *atelier* portrait in the painstaking choice of furnishings, in the studied composition of the poses and gestures of the sitters. Above all, with Carlo (1850–1925), Giacomo's son, the portrait evolved towards more refined forms in keeping with the taste of the period, according to the principles Carlo himself wrote in his treatise *Il ritratto in fotografia: appunti pratici per chi posa*, published in Florence in 1895. Among his most famous portraits are those of the royal family, as well as numerous portraits of the most disparate professions: industrialists, artisans, men of letters, travelling salesmen.

The Alinaris and Carlo Brogi played a fundamental role in the Società Fotografica Italiana, founded in 1889 and soon the main point of reference for anything that had to do with photography in all regions of Italy, mainly through its periodical *Bullettino*. In particular, Carlo Brogi was concerned with questions of copyright and the legal protection of photographs, and thus became an unflagging promoter of initiatives in defence of the profession.

After ca. 1860, the development of portraiture made great strides. It was a period when, through photography, the emerging bourgeoisie was trying to transmit and consolidate an image of its own status and rise to power. Next to the more widely diffused portraits in *carte-de-visite* format, there were portraits in larger formats, starting with the *cabinet* format, which corresponded to the economic resources and prestige of the sitter. The reduction of posing times made new compositions and a more careful interpretation of the subject possible. Among the most important photographers: in northern Italy, the studios of Luigi Montabone, Henry Le Lieure, Giulio Rossi, Alessandro Duroni, Giovan Battista Ganzini, Giovan Battista Sciutto (1827–1900 ca.); in central Italy, the Felici firm and the D'Alessandri brothers in Rome, who were also among the pope's photographers; the Brogi firm, Ugo Bettini in Livorno; in the South, the Interguglielmi studio.

"Genre scenes" were the main concern of some Italian photographers, in particular the Venetian Carlo Naya, the Roman Filippo Belli, Michele Amodio, Alphonse Bernoud, Giorgio Conrad, Giorgio Sommer in Naples. Sommer photographed local customs, the work of craftsmen, the humble but dignified condition of common people of Naples. His images, done in the studio or on the street, represent a varied, picturesque humanity, but without emplaning the problem of social differences; however, they never lacked respect for the subjects portrayed. They were mainly done as souvenirs for tourists.

The events of the Risorgimento served as a catalyst for many photographers. After Lecchi's shots in 1849, Eugène Sevaistre photographed the barricades in Palermo and the fort of Gaeta in 1860. Alessandro Pavia did an entire album of the thousand participants in Garibaldi's enterprise of 1860, thus accomplishing a colossal work single-handed. Other photographers did thousands of portraits, especially in *carte-de-visite* format, of the leading figures of the Risorgimento. Garibaldi, Vittorio Emanuele II and Cavour are among the most recurrent subjects, followed by hundreds of protagonists of the different phases of the war. Gioacchino Altobelli and Ludovico Tuminello (1824–1907) shot the breach that had been opened in the Porta Pia in Rome in September 1870.

After 1880 the new gelatine silver—bromide process technique opened up a whole new range of expression in photographic language. Next to the traditional *ateliers* and professional photographers, the so-called "irregular" photographers appeared. These were amateurs who, thanks to their up-to-date cultural and technical training, had an intuition of the great potential of the tool, and used it as a function of a new language. Existing conventions were abandoned, especially those derived from the rules of perspective, in order to search for new modes of representation. Next to the traditional genres discussed above, the doors were opened to true documentary work. By then, it was possible to reproduce motion and events as they were happening, exposure times could be reduced to a fraction of a second. And so the main characteristic of photography was revealed: it could see beyond our field of vision, and show what our synthetic way of seeing could not take in.

Among the main protagonists of this season: Luigi (1858–1925) and Giuseppe Primoli (1851–1927) in Rome, Giuseppe Beltrami and Luca Comerio (1878–1940) in Milan, Vittorio Sella (1859–1943). The Primoli brothers, whose snapshots showed the life of the *belle époque* of the Roman nobility (the landscape, the horse

races), as well as some episodes of the life of the people with their processions, festivals, and customs. Their special language showed their friendship with painters and artists of the Parisian milieu: think of the use of photography in Degas, or the studies of motion carried out by Marey and Muybridge, who certainly influenced the two brothers' technique.

Around 1890, Giuseppe Beltrami captured different aspects of *fin de siècle* Milan by shooting every sort of character in the streets of the city: humble *clochards*, travelling salesmen, ladies with their wet-nurses and children, business men with cigars and waistcoats. Beltrami worked with a Kodak n.1, the first apparatus for taking snapshots that used film on a roll. He would stop at a certain point in the centre of Milan, between piazza Duomo and piazza della Scala, and from there he would shoot whatever happened to pass by the camera's lens. His images, which were also collected in albums, were an enormous success and were presented at the most important exhibits of the period.

Luca Comerio, photographer and film industry professional, was the author of important photography on the Milanese turmoil of May 1898. The demonstrators, the barricades, the military troops at work putting down the fighting, were all documented in his photographs and then published in *L'Illustrazione Italiana* with the first photomechanical processes. He also did other important documentaries, including coverage of the War with Libia in 1912.

Vittorio Sella deserves mention among the Italian photographers of snapshots. This great photographer of the mountains was the author of documentaries on the Alps, the Caucasus, and the Arctic Circle between 1887 and 1904.

The photographic industry witnessed a phase of remarkable expansion, especially in Milan, a city rooted in industrial development. Here, the following firms sprang up: Oscar Pettazzi, who sold camera obscura, light-sensitive materials and treatises on photography; Salmoiraghi, Lamperti and Garbagnati, Koristka (famous for his lenses); Cappelli (famous for his plates).

The spread of amateurism encouraged the first associations of photographers and the proliferation of journals. In Rome in 1888 the Amateur Photographers Association was born; in 1889, the Italian Photographic Society and the Lombard Photographic Circle were created in Florence and Milan respectively; in 1896 the Bolognese Photographic Circle was founded in Bologna, as was the Camera Club in Naples; in 1899 the Subalpine Photographic Society was founded in Turin, and it incorporated the older Italian Photographic Union, founded in Turin in 1879. In the publishing field, apart from the aforementioned *Camera Oscura* and *Bullettino*, new journals appeared: *Amatori fotografi* in Rome, in Milan *Il Dilettante di fotografia* in 1890, the *Rivista scientifico-artistica di fotografia*, a periodical of the Lombard Photographic Circle, in 1892, and *Il Progresso Fotografico* in 1894.

The exhibits and conferences in this period show that there were different trends in Italian photography. Next to the traditional photography of the professional *atelier*, the work of learned amateurs was making headway. These photographers worked outside the studio and put forward new forms of language which barely exploited the characteristic techniques of photography. Amateurs and professionals alike were involved in the progressive rise of pictorialism, a trend that first appeared in Italy at the Exhibition in Turin in 1898. Here, artistic photography was first separated from technical and commercial photography, thus claiming its cultural role. Optics, chemistry and mechanics were subordinated to artistic creation. Influenced by the theories of Peter Henry Emerson, photographers like Guido Rey (1860–1935), Cesare Schiapparelli, Enrico Grosso, Wilhem von Gloeden, Luigi Cavadini (1878–1962) and Mario Nunes Vais (1856–1932) came to the fore. Experimentation with a new artistic language led to the use of new printing techniques like bromoil and gum bichromate. The Turin Exhibition took place at the same time as 1st Italian Congress on Photography, which confronted the problem of the social role and recognition of the photographer. At the National and International Exhibition in Florence in 1899, there was also the 2nd Congress on Italian photography, and photographers saw the work of Alfred Stieglitz, Robert Demachy, H. P. Robinson, and the Camera Club of Vienna. At the Exhibition of Artistic Photography, promoted within the First International Exposition of Modern Decorative Arts held in Turin in 1902, more non-Italian photographers were present, in particular, members of the Photo Club of Paris. The Italian photographers on exhibit were of high quality, and clearly showed, together with the triumph of the art nouveau style, that Italian artistic photography had reached a fully mature phase.

Silvia Paoli

See also: Daguerreotype; Genre; Wet Collodion Positive Processes; and Calotype and Talbotype.

Further Reading

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ITIER, ALPHONSE-EUGÈNE-JULES (1802–1877)

French photographer

Jules Itier was born in Paris on 8th April 1802, the son of a military commandant, and entered the French Customs Service at the age of seventeen. Before he was thirty, he had achieved the rank of Inspector.

His interest in photography dates from 1840 when he was introduced to the daguerreotype, and over the following years, his work and his enthusiasm for travel took him and his camera to many parts of the world. His surviving oeuvre includes daguerreotypes made in Senegal (1842), India (1844), Ceylon (1844), Guadaloupe (1843) and Guyana (1843). He arrived in China as part of a French delegation to sign a trade agreement

Itier, Andre-Victor-Alcide-Jules. Monsieur Itier's Cange Under Sail on the Nile.
The Metropolitan Museum of Art, Gilman Collection, Gift of The Howard Gilman Foundation, 2005 (2005.100.189) Image © The Metropolitan Museum of Art.

in 1844, producing many fine images in Canton, Macau and elsewhere in 1844 and 1845. Those images survive as the earliest photographs ever taken in that country.

In 1845 he travelled to the Phillipines and Borneo—he reportedly bought supplies of plates and chemicals in Manilla—and later that year arrived in Egypt. A number of fine images of the antiquities of Egypt survive from his journeys in 1845 and 1846.

Returning to France in 1846, he continued to pursue his interests in photography until the late 1850s. His images were rediscovered in the late 1970s.

JOHN HANNAVY

ITINERANT PHOTOGRAPHY

From the day the invention of photography was announced to the world, innovative photographers knew that if patrons would not come to studios, then the studio would have to come to them, and as such the birth of the itinerant photographer occured.

Before the advent of the itinerant photographer, several excursion were attempted where camera manufacturers sent employees laden with supplies to "capture" exotic locations of the world. Among this exclusive community of patrons were to wealthy tourists, writers and artists to which these photographers were later "contracted." Horace Vernet, Romantic painter, traveled to Egypt in 1839 under the sponsorship of supplier Lerebour to capture images that later sold as the famous *Excursions Daguerriennes* aquatints. "We kept daguerreotyping like lions," he enthusiastically remembered. In 1855, Roger Fenton and his "Photographic Van" recorded ersatz camp life during the Crimean War, and while in North America the earliest travelling photographers were components of government expeditionary, geologic, boundary and railway surveys. Many itinerant photographers followed or branched away from the growing networks of paths, roads and railway systems. During the American Civil War, portraiture was important as never before in family life, and itinerant photographers in particular enjoyed a boom equal to that of when photography was first introduced. Lowly soldiers seeing for the first time itinerants travelling into war theatres often dubbed the horse drawn studios as "What-Is-It?" wagons.

The definition of an "itinerant photographer" or "itinerant" remains one where a person 'travels with photographic supplies with the purpose of purveying their trade and the intent of selling (and even bartering) their photographic results to a hopeful populace.' Itinerant photographers, whether previous apprentices or self-taught, came from all walks of life and were of both genders.

Some found that life on the road provided a good income. Studio owners sometimes closed their city business for the summer and traveled to resorts and small towns, setting up portable studios and darkrooms on the outskirts of towns and villages. Others hired temporary assistants to cover studio operations while they traveled, or else sent the employee on the road to do predetermined circuits—some with considerable distance and need of time. Such travels however would not successfully happen until the existence of a viable portability of the technology and its convenient use.

In 1851 the Englishman Fredrick Scott Archer invented the wet plate collodion process. This quickly supplanted both the daguerreotype and the calotype, as photographers were now able to make infinitely *reproducible* negatives. Unfortunately cumbersome, the wet collodion process required not only camera, tripod and glass plates, but also chemicals, and a portable dark tent practical enough to travel even by canoe, dog cariole or elephant, as examplified respectively in Canada, Scandinavia and India. On location it was necessary to have at least a barrel of "clean" water, as almost invisible amounts of foreign matter in the silver nitrate bath would invariably result in a blank plate. Frederick Hardwich's indispensable *A Manual of Photographic Chemistry Including the Practice of the Collodion Processes* was a common manual among English speaking itinerants.

The collodion's light sensitivity—or lack thereof, and the need for immediate preparation and use; as well as existing optical properties of the camera, did deter its early usage. In later years the reasonably fast exposure times spurred many to promote "good expressions" and encouraged patrons to "bring their children and babies to be photographed." Few itinerant photographers used the wet collodion process other than for the making of ambrotypes or more often the ferrotype also known as "tintype."

By the 1870s more light-sensitive gelatin dry plates traveled throughout many parts of the world. Itinerant photographers ceased to work with the old wet-plate technology and thus reduced the bulk of necessary paraphernalia. The pre-sensitized dry plates eliminated the need for awkward chemical procedures and the new sensitized papers all but ended the old chemical technology.

Ironically, even with advancements in technology, the photographers were often unaware of then-unknown consequences of their craft. It is well recorded that early photographers, and itinerants in particular, mentioned "recouperating from unknown" illnesses or "afflicted with very sore eyes"—a result of extended exposure to chemicals under light-tight portable tents and other housing contraptions with poor ventilation.

The practicality of transporting supplies on a travelling circuit posed various problems. Most itinerant photographers did not buy their supplies along the way and few are known to have had depots along their

routes. The very nature of early unreliable or inconsistent chemistry and supplies made this perilously obvious—not to mention potential pilfering or outright theft of stock in distant centres. No less important: weighty supplies carried either by horse or donkey or pulled on spring-wagons were prone to accidents—thus the need for an all-encompassing secure method of supply and transport. The results reflected the photographer's initiative to provide functional practicality due to prevailing geographic and economic concerns—and the success of their vocation.

Depending on their situation, some peddled their bicycles across the land carting assorted ingeniously collapsible darkrooms, and slept in tents; others had private railway cars.

Possibly the most ingenious portable self-contained photography darkroom was the "fitted" or "collapsible dark tent." This was literally a slightly oversized suitcase that, sequentially unfolded and set up, formed a table with insert trays, chemistry holders and shelves, and provided for equipment storage. It was covered over and fastened with a light-tight rubberized fabric bag or "tent" allowing the photographer to hide under while they performed the necessary tasks of preparing wet collodion plates like inserting glass negatives into dark slide holders, developing and fixing images or endless other tasks that required total darkness. To prevent insects or dust from spoiling any particular task, the tapered bag fit over the operator and often tightened around the waist. While this was an amazing bit of technology, one had to be hardy and proficient—especially on hot days as temperatures under the tent often became intolerable. Itinerants quickly learned to trust their sense of touch and smell to monitor their progression during the preparation of chemicals or subsequent developing stage.

Certainly during the formative years many itinerants used compact, very portable horse drawn wagons. Exceptionally there were those on sleighs or on riverboats. From the proliferation of images extant we know that itinerant photographers used several ingenious versions of drawn or train-ferried studio-darkrooms. Many included the basics: light-free storage area for chemicals and supplies; special windows glassed to provide pre- and post-development needs as required; and repair and equipment storage area. Considerably fancier vehicles included a studio complete with skylight and indoor props. Purportedly there existed American wagons that could be transferred from track to wheels where and when required. Mid range studios might photograph patrons outside but had collapsible chairs or benches for those waiting.

Presence probably awed the potential customer but only the final photographic results conveyed the true richness of their talents. Indeed, not all itinerant photographers were successful at their trade. Early prairie newspapers mentioned itinerant photographers were not above bartering for wheat, flour, wood or other method of payment for "likenesses." Many had secondary employment as well. The 1850s directories suggested that "photographists" and "ambrotypists" fell back on other professions including civil engineering and draughtsmenship. One was even known as a hypnotist. This level of 'confidence' was more or less consistent in directories published thirty years later. Some photographers plied their trade and sold pianos in the same ad. Some sold real estate and others were insurance salesmen. In North America there were several interesting examples of photographers becoming fur trappers. A Methodist priest-turned-photographer plied his itinerant trade for only two years before his "conversion" to blacksmith. Several met tragic deaths in various parts of the world, including being found purposefully severed in two on railroad tracks.

To promote their trade most itinerant photographers made repeated use of advertisement. The purchase in advance of a spot in newspapers or on broadsheets from towns and hamlets along their travelling route notified prospective patrons of the opportunity to be photographed at set dates and locations. Some advertisements were brief or generic; others touted in great details the photographer's talent and resourcefulness. It was not uncommon to see boastful advertisements such as: "Now is your chance to get good work—better than ever turned out in this town before." Some ads were even purloined from other unsuspecting itinerants. Newspaper publishers printed submitted ads rather indiscriminately under "Business Card," "Artistry," "Photographs," "Photography," "Town," "Local" and "General" or "Miscellaneous" news. Few photographers were moved to advertise with impending seasonal holidays or visiting dignitaries—possibly a function of how slow news traveled. Retractions, "pending" notices, or apologies for changed schedules were common and regrettably often posted after the fact.

Advertisements signaled trends; such as procuring images of sick and, in particular, deceased family members. Since the advent of daguerreotypy and continuing much until the early years of the twentieth century, people brought their deceased to photographers. Itinerants could be counted on to make a keepsake of patrons' dearly deceased—often children. Europeans favoured very much an image transferred to ceramic and then secured onto the tomb of their loved one. Itinerants were adept at producing or transposing, images onto leather, ferrotyped metal, milk glass, silk, porcelain and assorted other materials. However in some cases (most notably the glazed ceramic) work would be carried out later in

a major centre and the patron would receive the finished item upon the itinerant's next visit. Newspaper articles often pointed out that several months passed before receiving a "favourable likeness of one's deceased." Some itinerants managed to have their darkroom work done at a studio in the region they visited but local operators often resented them because they naturally competed for business. Itinerants paid no rent or utility costs, and could undercut prices charged by established studios. Thus most chose to set up at the town's edge, in the open air. Grass became the studio floor and carpet. The image often "captured" patterned fabric or painted backdrops, were often blurred by breezes. The intent was to quickly take a picture and produce several copies thus reducing labour and increasing profit. For pennies more, patrons could have images housed in cheap, white-metal, clasped jewelry or encased.

So as not to be burden with extra weight, itinerant photographs cleverly made use of materials at visiting sites. Carded or framed tintypes were often backed with cuttings from local newspapers. Photographs were mounted on a card support imprinted with the photographer's particular trade design, locale, etc. Some were intricately printed and embossed; others were simply rubber-stamped onto the cards. These individualistic markings or 'imprints' provided clues to the photographers work. One photographer promoted his work as the "soldier's headquarter" as he traveled closest to war torn areas; others heralded themselves as the "ranchman's photographer" thus indicating their expertise. Sure to please was the notation "Photographer to the People." Itinerant photographers, compared to studios, often chose not to protect their work. There were however, examples of subtle symbols or disguised words found on certain Canadian itinerant photography which can be traced to later copied works by other itinerant and studio photographers.

With the advent of truly portable and affordable cameras, the growing interests of travelling camera clubs, and of "snapshooters," the itinerant photographer became a dwindling reality by the early 1900s. Many would fashion themselves into street photographers, where it was the 'itinerant' customer who would approach the photographer and pose for a souvenir image. Possibly the last vestige of itinerant photography was a 1907 patent and detailed drawing, by Frankfort, Germany, photographer Jean Schmidt, of a travelling electric studio car. Unfortunately his travels were dictated by that city's and neighbouring communities' limited overhead trolley lines.

PHILLIPE MAURICE

See also: Lemercier, Lerebours & Bareswill; Fenton, Roger; Archer, Fredrick Scott; Wet Collodion Positive Processes; and Tintype (Ferrotype, Melainotype).

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IVES, FREDERIC(K) EUGENE (1856–1937)

American scientist and physicist

Ives was born in 1856 and is known for his pioneering work in photo-mechanical reproduction in both black-and-white and color as well as his early three-color additive photography. Ives is the inventor of photoengraving (halftone block engraving) as we know it today. In 1878 he started to commercially produce screens for the halftone printing process in Philadelphia. Earlier it was not possible to print different gray levels, only black and white could be printed. When working at Cornell University, Ives invented a screen that would convert a photograph or drawing into a pattern of tiny dots—large dots forming where the image was dark and tiny dots where the image was light—giving the illusion of shades of gray. An original photograph to be printed had to be re-photographed through Ives' screen. In this way a halftone was obtained which was then engraved onto a metal plate from which the image could be cheaply and quickly printed on paper. Ives' first halftone process, patented in 1878, consisted of a gelatin relief which was cast in pure white alabaster plaster and brought in contact with an indiarubber sheet covered with pyramidale raised points or lines which had been inked. According to the amount of relief on the cast the rubber points were more or less spread out and

thus gave dots of ink of varying size on the surface of the cast. The light and shade of the image was reproduced and the cast photographed.

Ives invented also the first cross-line halftone screen, composed of two plates with finely ruled parallel lines cemented face-to-face, with the rule patterns running at right angles to one another. The resulting dot pattern could capture finer image details than the inks, papers and the printing pressures at that time could reproduce.

Ives got interested in color photography and by 1892 he had developed an additive three-color photographic technique (composite heliochromy). By the aid of a special photochromoscope camera, fitted with an arrangement of mirrors, prisms and light filters, three images of the object or scene were recorded in succession on three sensitized plates. On image was recorded through a red filter, a second image through a green filter and the third one, through a blue filter. After the negatives have been developed, three positive plates are recorded by contact printing the three negatives. These three transparencies, though themselves of no color, contain information about the color content of the recorded object or scene. The positive plates are mounted and inserted in the viewing device, the *Chromoscope*, in which the plate containing the red information is illuminated with red-filtered light, the green plate, with green-filtered light, and the blue one with blue-filtered light. When the three plates are correctly superimposed in the instrument, a color image is visible. Ives chose the name *KRÕMSKÕP* for his various additive color systems and his type of color photographs is known as *Kromograms*.

In 1893, Ives was also able to make a stereo KRÕMSKÕP, in which pairs of red, green and blue negatives were recorded through color filters in the same way as for the two-dimensional color images. In the viewing instrument, the color photographs were observed with both eyes, and the color picture consequently seen in 3D.

In 1895 Ives constructed a projector, the Projection KRÕMSKÕP, in which the three transparencies could be illuminated with filtered light and projected superimposed on a screen. Ives made both a Diffraction Chromoscope as well as a camera which could record the three color-separated plates in one shot. Louis Ducos du Huron in France had also introduced a similar one-shot color photochromscope camera, the Mélanochromoscope.

The color images recorded with Ives' technique are of high archival stability and the colors will never fade since the color information is encoded in the three black-and-white transparencies. Only when correctly illuminated and superimposed, the color image is synthesized and possible to see.

In Ives' company in Philadelphia, educational Kromograms were produced, such as prepared medical specimens. Beginning in 1898, the KRÕMSKÕP and Kromograms, including also stereo pairs, could be obtain from the Photochromoscope Syndicate Ltd, 121 Shaftesbury Avenue, in London.

In the 1920s, Ives was working on ideas for the subtractive synthesis of color, trying to find dyes and suitable materials for the process. During the 1930s, Ives experimented with the Hi-Pro color process and the two-color Polychrome process, but the results could not equal those achieved with three-color photographic materials or four-color photomechanical reproduction.

Among some other of Ives' inventions is the *parallax panoramagram* patented in 1903. This was a concept for a look-around multiview 3D image based on the raster-barrier principle. Ives invented also, for example, a single objective binocular microscope.

The Optical Society of America (OSA) highest award is the *Frederic Ives Medal*. It was endowed in 1928 by Ives' son Herbert E. Ives to honor his father and his important contributions to photoengraving and color photography.

Some of Ives' early prints are preserved in the Smithsonian Institution.

HANS I. BJELKHAGEN

Biography

Frederic(k) Eugene Ives was born in Litchfield, Connecticut, 1856, the son of a farmer. At thirteen, he left the family farm to become a printer's apprentice at the *Litchfield Enquirer* newspaper and later an apprentice at the Itacha printer Andrus & McChain. In 1874, at the age of eighteen, he applied for a position of photographic technician at Cornell University. Professor W. A. Anthony reluctantly hired him thinking he was too young and inexperienced. The next year he became the director of the university's first photographic laboratory. He remained at Cornell until 1878. During his four years at Cornell he invented the halftone printing process.

By twenty-five, he moved to Philadelphia where he accepted a contract with the wood-engraving firm Crosscup & West, to further develop and commercially produce his halftone screens. Already in 1884 he was able to make high-quality orthochromatic plates for photomechanical applications. In 1887 he moved to Philadelphia and started a photogravure printing company there. The same year Ives was granted a patent for halftone printing. Ives invented also a halftone screening process In the late 1880's he started his work on three-color photography. In 1892 he made his first Chromographoscope, the KRÕMSKÕP, with an improved version introduced in 1895. In 1898 Ives started a company called the Photochromoscope Syndicate Ltd in London.

During his lifetime he received a total of 70 patents. Ives' son Herbert E. Ives (1882–1951) was also a recognized photo scientist, working on color photography and a pioneer of photo-transmission of images. Frederic(k)

Ives continued to work on color photography until he died in 1937.

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JACKSON, WILLIAM HENRY (1843–1942)

The photographs which earned William Henry Jackson an important place in photographic and American history were made in the last quarter of the nineteenth century, but he continued an active life well into the next century with his images reaching an ever wider audience through color post cards, publications, and exhibitions. Unlike other pioneer photographers of the West, Jackson became a living legend.

Born in Keeseville, New York, on April 4, 1843, Jackson credited his mother with providing watercolor instruction and with introducing him to Chapman's *American Drawing Book.* Following school graduation in 1858, he became a retoucher and colorist for a Troy photographic studio, and two years later he was similarly employed in Rutland, Vermont.

With the onset of the Civil War, Jackson enlisted in a Vermont regiment and served as a staff artist. Honorably discharged in 1863, he returned to the Rutland studio, but the following year he became a studio artist in Styles'Gailery in Burlington, Vermont. Here, his cultural horizons broadened, but a broken engagement resulted in an abrupt departure for New York, where he and two buddies then headed westward toward Montana silver mines. He drove oxen, worked as a farm hand in Utah, and unsuccessfully sought work in California before abandoning the mining quest to head eastward. After driving wild horses to Julesburg, Wyoming, and boarding them on a freight train to Omaha, Nebraska, he found a job in that city as a colorist in the Hamilton Gallery. With help from his father, he bought out this photographic studio along with the competitor in 1867, and the next year he formed Jackson Brothers, Photographers, with his brother Ed.

Realizing that studio work was not his forte, Jackson photographed both landscapes and Native Americans as he followed the route of the yet unfinished Union Pacific Railroad in 1868. He used the cumbersome wet plate process.

The Union Pacific and the Central Pacific tracks finally met at Promontory Point, Utah, on May 10, 1869, but Jackson was in Omaha that day marrying Mollie Greer. Dr. Ferdinand V. Hayden, Director of the U. S. Geological and Geographical Survey saw Jackson's work, and the following year included him, without salary, on the 1870 expedition along the Old Oregon Trail through Wyoming.

Hayden, like fellow surveyor and geologist Clarence King, followed John Ruskin's aesthetics, so he viewed Jackson's detailed work as both scientific document and artistic statement. Painter Sanford Gifford was also with the Survey. For the 1870 Wyoming expedition, Jackson used a whole plate (6½" × 8½") camera, and photographed both views and Native Americans, as Hayden wanted records of what was wrongly believed to be a vanishing people. Jackson usually photographed Indians in a straight-forward manner, though sometimes with studio props. His later photographs of the Moquis pueblo show the native people in their environment.

Some of Jackson's most memorable photographs were made on the 1871 expedition to Yellowstone. Accompanying the party was the painter Thomas Moran, who like Gifford, influenced Jackson's photography. Jackson photographed the geysers and hot springs with a stereoscopic camera and with an 11" × 14" camera (imperial plate size). One of the legends surrounding Jackson was that the Yellowstone photographs swayed legislators to vote in favor of making this area the first National Park. Howard Bossen, however, has effectively demonstrated that Jackson's photographs were but one factor in a powerful lobbying effort to preserve these lands.

Salaried since 1871, Jackson remained with the Hayden projects until the Survey was disbanded in

Jackson, William Henry. Mammoth Hot Springs, Pulpit Terraces. *The Metropolitan Museum of Art, Rogers Fund, 1874 (1974.530) Image © The Metropolitan Museum of Art.*

1879. During this time he made Mountain of the Holy Cross, in1873, a photograph which Moran used for a painting. For the Philadelphia Centennial Exposition of 1876, Hayden placed Jackson in charge of the Survey's exhibition, which included his photographs and his clay models of cliff dwellings based on his exploration the previous year in the Mancos Canyon and Canyon de Chelly.

With the end of the Survey, Jackson left Washington, D.C. in 1879, and moved to Denver, Colorado, where he formed the Jackson Photographic Company. Meanwhile, western railroads sought tourists and settlers on their routes and recognized the persuasive power of dramatic landscape photographs. Beginning in 1881, Jackson worked for numerous lines as an "official railroad photographer," and depicted landscape and trains in picturesque and sublime settings. He now used the new dry plate process, and much of his work involved mammoth plates (18" × 22").

This western railroad photography led to the Baltimore & Ohio railroad's P. G. Pangborn hiring Jackson in 1892, to photographs along that company's route. The photographs were shown at the World's Columbian Exposition in Chicago in 1893, where Jackson was commissioned to photograph the architecture.

Pangborn then organized The World Transportation Commission and hired Jackson to photograph a tour that included Egypt, India, China, and Russia. Jackson was away from his business and family for 17 months, during which time he also supplied *Harper's Weekly* with photographs and articles.

Returning from the arduous tour, Jackson found his business foundering, and he sold out to the Photochrom Company in 1897, to become a salaried director and part owner of the parent company, The Detroit Publishing Company. Jackson continued to actively photograph until 1903, when managerial duties precluded extensive travel. The Photochrom Company failed in 1924, and Jackson retired.

In 1936, Jackson painted murals for the U. S. Department of the Interior in Washington, D. C. That same year Henry Ford acquired 40,000 of his negatives for the Edison Institute in Dearborn, Michigan. By this time Jackson's camera of choice had shifted from the 20" × 24" plate camera used on the 1875 expedition to a 35 mm Leica. By 1939, he was using Kodachrome film.

Jackson also produced a series of romanticized watercolor paintings based on his original sketches, photographs, and recollections. When 97, he published an autobiography, *Time Exposure,* which Peter Hales found "heavily embellished," but which Douglas Waitley claimed had "a scrupulous regard for accuracy..."

Shortly after a fall, Jackson died on 30 June 1942, in New York City at age 99.

JOHN FULLER

Biography

Born, Keeseville, New York, 1843. Retoucher and artist in Troy, New York studio, 1857; similar job in Rutland, Vermont, 1860. Civil War volunteer 1861–63; returned to Rutland studio. Artist in Burlington, Vermont studio, 1 864. Left New York City l 866, for West; various jobs including builwhacking. Formed Jackson Brothers, Photographers, 1867. Married Mollie Greer in 1869, and photographed Wyoming. "Official Photographer," for F. V. Hayden and U.S. Geological and Geographical Survey, 1870–1879. Moved to Washington in 1872, wife died in childbirth. Married Emilie Painter, 1873. Photographed members of Ute tribe, 1874. Organized Survey's exhibit, Philadelphia Centennial, 1876. Founded The Jackson Photographic Co., Denver, Colorado, 1879,' work began as "official railroad photographer." Incorporated as W. H. Jackson Photograph and Publishing Co., 1883. Exhibited and photographed World's Columbia Exposition, Chicago, 1893. World Transportation Commission tour with *Harper's Weekly* assignments, 1894–1896. Part owner, The Detroit Publishing Go. Photographed actively until 1903-, retired from the Detroit Publishing Co., 1924. Mural commission from Department of the Interior, 1936, paintings for National Park Service in 1937. Honorary Fellow, Royal Photographic Society, 1938. Watercolors completed for Oregon Trail Association., 1939. Published autobiography, *Time Exposure,* 1940. Honorary degree from University of Wyoming (Laramie), 1941. Died, New York City, 30 June 1942.

Group Exhibitions

1876 Centennial Exposition, Philadelphia, Pennsylvania. Awarded several medals 1889 Jubilee Exhibition, Berlin, Germany. Highest Honors.
1895 Calcutta (India) Photographic Exhibition. Bronze Medal 1902 Traveling exhibition in Santa Fe Railway private car.
1936 Exhibition of Jackson Collection, Denver Public Library.
1942 "Photographs of the Civil War and the American Frontier," Museum of Modern Art, New York City.

Selected Works

"156 Mountain of the Holy Cross," 1875.
"Cañon of the Rio Las Animas," ca. 1882.
"1068 Grand Cañon of the Colorado," ca. 1892.
"573 The Choonbatty Loop on the East Bengal Railway in the Himalayas," 1895, "1091 Mammoth Hot Springs on Gardiner's River (Wyoming), after 1880 "296 View from Tequa Towards Moqui," 1875.

See also: Landscape; and Ruskin, John.

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JAMES, HENRY (1803–1877)

English, patron, officer of the Royal Engineers (Lieutenant 1831, Captain 1846, Colonel 1857, Director General Ordnance Survey 1854–75)

Throughout his career, Colonel Sir Henry James was a proponent of photography as an adjunct to the mission of the Royal Engineers and the Ordnance Survey Office, both in the work of surveying and mapping and resultant publications. He pioneered the use of photography as a method for reproducing maps and plans and established a studio at the Ordnance Survey offices in Southampton where maps, plans, and documents were photographically reproduced. In 1859 he published *Account of Methods Employed for the Reduction of Plans by Photography.* Later he claimed the invention of a photo-mechanical technique, photo-zincography, which was developed by two men under his command at the Ordnance Survey Office in Southampton, England, and at first, starting in 1859, simply a method of preparing a photo-lithographic transfer and applying it to a zinc plate, afterwards printed from. Direct prints from negatives were then made on the zinc plates. Photozincography may refer to a line or a half-tone process. His first successful photozincograph was a reproduction of an etching in 1859. Sir Henry James read a paper to the British Association "On photozincography" in September 1861.

James also saw the utility of photography in field work and ordered the inclusion of photographic documentation in many of the Office's surveys: *Ordnance*

Survey of Jerusalem (1864); *Ordnance Survey of Sinai Peninsula* (1869); *Plans and Photographs of Stonehenge and of Turusachan in the Island of Lewis* (1867); and *Notes on the Great Pyramid of Egypt and the Cubits Used in Its Design* (1869). In addition he oversaw the production of a photographic facsimile of the *Domesday Book* or ancient record of the Survey of English lands, ordered in 1086 by William the Conqueror. This was the first systematic geographic record in England. Under his leadership, photography was an integral component of mapping and surveying accomplished by one of the nineteenth century's most influential forces for exploration.

KATHLEEN HOWE

JANSSEN, PIERRE JULES CÉSAR (1824–1907)

French astronomer, inventor, and photographer

Janssen studied the solar spectrum and developed a spectrohelioscope in 1868. In 1867 he concluded that water vapor was present in the atmosphere of Mars. He also discovered an unknown spectral line in the Sun in 1868 and later shared that information with Norman Lockyer, who was credited with the discovery of helium. Janssen was the first to note the granular appearance of the Sun, and published a monumental solar atlas in 1904. Janssen taught Mathematics and Physics and was appointed as correspondent to India to observe the total eclipse of the Sun in 1868. His first contribution to scientific photography was proof, using a spectroscope, that the solar prominences are gaseous. He also discovered the chromospheres, a type of gaseous envelope of the Sun. The French government appointed him director of the Astrophysics Observatory in Meudon, France, where he resided for about 30 years. Janssen studied mainly the Sun, publishing an atlas with almost 6000 pictures of its surface.

The convention of photography confronts Janssen with the given world, with what one can find in the real world and what the camera may register in its fragmentary vision of time and space. The photographer merely decides when, where and how to do it, which seriously limits the author in the possibilities of creation based on some direct way of shaping the image. In a certain sense, the images had always been there—the task of Janssen is only to spot and register it, which does not seem much. But the history of photography proves that one can perform enormous tasks in this seemingly narrow field. For Janssen himself as a player in the history of photography is photography a creative tool that is composed of repeatedly undertaken attempts at transgression, attempts of going beyond the urely documentary relation between the image and its object. Transgressing this basic feature of photography was for Janssen a fascinating challenge.

Janssen was born in Paris, in 22 February 1824. He became handicapped by a childhood. Pierre Jules César Janssen studied mathematics and physics at the faculty of sciences at the university of Paris. He taught at the lyceum Charlemagne in 1853, and in the school of architecture 1865-71, but his energies were mainly devoted to various scientific missions entrusted to him He became very quickly fascinated with the spectroscopic work of Gustav Kirchhoff and Robert Bunsen. Under their influence, the young man began his search on the solar spectrum in 1862 and showed in particular that certain lines of the spectrum are due to the steam of the Earth's atmosphere. He studied the work of John William Draper, who took a photograph of the moon in 1840. His son, Henry Draper, later became the first person to photograph the Orion Nebula in 1880, which was essentially the first deep sky photograph.

In 1857–58, he worked in Peru on the determination of the magnetic equator and in 1861–62 and 1864, he studied telluric absorption in the solar spectrum in Italy and Switzerland.

In 1867 he conducted optical and magnetic experiments at the Azores, successfully observing both transits of Venus, the first in 1874 in Japan, and the second of the 1882 transit at Oran in Algeria. He took part in a long series of solar eclipse expeditions, e.g., to Trani (1867), Guntoor (1868), Algiers (1870), Siam (1875), the Caroline Islands (1883), and to Alcosebre in Spain (1905).

At the Azores (1867) he examined magnetic and topographical conditions. In 1868 Janssen went to India to observe a total eclipse of the Sun. He was unable to correlate certain lines in the solar spectrum with wavelengths of any known elements. English scientist Norman Lockyer made the same discovery of a new, unknown element and reported it simultaneously to the French Academy of Sciences.

An intrepid traveler in spite of his infirmity, Janssen traveled to Peru, Italy, Switzerland, Algeria (which he reached in a balloon from Paris besieged by the Prussian army in 1870) and finally to Guntur, India.

At this great Indian eclipse of 1868 he demonstrated the gaseous nature of red prominence, and devised a method of observing it under ordinary daylight conditions. One main purpose of his spectroscopic inquiries was to answer the question whether the Sun contained oxygen or not. An indispensable preliminary was the virtual elimination of oxygen-absorption in the Earth's atmosphere, and his bold project of establishing an observatory on the top of Mont Blanc was prompted by a perception of the advantages to be gained by re-

ducing the thickness of air through which observations would be made. This observatory, the foundations of which were fixed in the snow that covers the summit to a depth of ten meters, was built in September 1893, and Janssen, in spite of his sixty-nine years, made the ascent and spent four days taking observations. On August 18 1868 of that same year, while observing an eclipse of the Sun in India, he noticed a bright yellow line with a wavelength of 587.49 nm in the spectrum of the chromospheres of the Sun. Janssen was at first ridiculed since no element had ever been detected in space before being found on Earth. On October 20 of the same year, English astronomer Norman Lockyer also observed the same yellow line in the solar spectrum and concluded that it was caused by an unknown element after unsuccessfully testing to see if it were some new type of hydrogen. Since it was near the Fraunhofer D line he later named the new line D3, distinguishing it from the nearby D1 and D2 doublet lines of sodium. He and English chemist Edward Frankland named the element after the Greek word for the Sun god, Helios, and, assuming it was a metal, gave it an -ium ending (a mistake that was never corrected).

Janssen belonged to this group of photographers for whom even considering the respect they have for the medium nd their awareness of tit limits a purely technical relation is not enough. Janssen created his world for registration himself, subordinating its images to certain manual manipulations because of the need to manifest his own creativity.

In 1874, the French government proposed Janssen is the director of a new observatory intended for astronomical physics. He accepted the offer and chose the site of Meudon for observatory and in 1876, he collected the remarkable series of solar photographs for his great Atlas de photographies solaires (1904). The first volume of the Annales de l'observatoire de Meudon was published by him in 1896. Astrophotography is a specialized type of photography that entails making photographs of astronomical objects in the night sky such as planets, stars, and deep sky objects such as star clusters and galaxies. Astrophotography was used to reveal objects that are too faint to observe with the naked eye, as both film and digital cameras can accumulate and sun photons over long periods of time. Astrophotography posed challenges that were distinct from normal photography, because most subjects were usually quite faint and often small in angular size.

Janssen later became director of the observatory on Mont Blanc. His photographer's of the mountains has interested for the way in which it has involved two main paradigms of historical method, whose results have come together in a very fruitful and complementary manner.

I refer on the one hand, to the concept of the photograph as in effect a container for data from which evidence may be deduced, a classic approach to photographic history; and on the other, to a view of the photograph which owes more to archeology, and pays attention tot the nature of what is to be found with it, irrespective of whether or not there is any primarily photographic connection. However, it depends on each perceiver's sensibility and imagination how broad and interesting the visual world of Janssen might seem. He died at Meudon by Paris on the 23rd of December 1907.

JOHAN SWINNEN

See also: France; Astronomy; Topographical Photography; Science.

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JAPAN

When Daguerre made his historic announcement to the French Academy of Sciences in 1839, Japan had been officially closed to the outside world for two hundred years and was not to be opened to foreign trade for another twenty. News of scientific progress in the West only came to Japan as a result of the exclusive trading privileges that the Kingdom of the Netherlands enjoyed with the Shogun's government, and it is a striking testimony to the persistence and dedication of contemporary Japanese scholars of Western learning—or *rangaku* ('Dutch Learning')—that the first camera was imported into Japan in 1843. This was in response to an order made through the Dutch trading post in Nagasaki by a local merchant, Ueno Toshinojô, and it is typical of the numerous false starts that bedeviled the advent of photography in Japan that the daguerrian apparatus was unaccountably sent back and Ueno was not to see his purchase again until it was finally returned to

Nagasaki in 1848. Various new words were minted by Japanese scholars and lexicographers to describe the new technology, ranging from the direct transliterations into Japanese syllabic script such as *dageriyoteipu* to more elegant coinages employing Chinese characters, such as *ineikyô* ('Shadow-printing Mirror'). By the mid-1860s, however, the classical expression *shashin* (literally 'Copying Truth'), which had hitherto been used to describe a genre of Chinese-influenced painting, gained the widest currency, and to this day remains the Japanese word for photograph and photography.

The first Japanese photographers operated for the most part in a theoretical vacuum, and although many were able to acquire the necessary equipment and supplies, all of them had to struggle to apply the hard-won book knowledge they acquired through translations of Dutch textbooks to compensate for their lack of practical experience. Early researches into photography also required the support of those feudal lords who had a profound interest in Western Learning. Ueno's camera was acquired in 1848 by Shimazu Nariakira, lord of the powerful Satsuma domain, who duly commanded two of his clan scholars, Kawamoto Kômin and Matsuki Kôan, to experiment with the apparatus. Although Kawamoto studied enough Western writings on the daguerreotype process to publish the first Japanese photographic manual in 1854, success evaded the Satsuma scholars for many years, and it was only in 1857 that two other retainers of the clan, Ichiki Shirô and Ujuku Hikoemon, succeeded in taking a daguerreotype likeness of their lord, thus achieving the joint distinction of being the first Japanese to take a photograph. Other domains also conducted research into photography, such as Mito, Fukuoka and Kaga. Even after the arrival of foreign photographers in Japan after 1859, daimyo patronage was of great help to many Japanese photographers, the most famous being Ueno Hikoma, son of Toshinojô, who after learning the wet-collodion from a Western photographer visiting Nagasaki, persuaded the daimyo of the Tsu domain to sponsor his further photographic studies in Edo during 1860–61. In 1862 Ueno published the first guide in Japanese to the wet-collodion process and returned to Nagasaki to open the first commercial studio in the port.

It was through the agency of a Western photographer, however, that the first known photographs were taken in Japan. In 1854, Eliphalet Brown Jnr., a daguerriean from New York, arrived in Japan as part of Commodore Perry's mission to open up the country to foreign trade, and his contribution to the visual record of the mission was later incorporated in lithographic form into the official account published by order of the United States Congress. Less fortunate was Lieutenant Aleksandr Feodorovich Mozhaiskii, who also took daguerreotypes during a parallel Russian expedition to Japan, but whose work was lost before he even left Japan when his ship was destroyed in a tidal wave in 1855. Brown and Mozhaiskii were the first of a wave of foreign photographers who came to Japan over the following decade. Most were amateur photographers who were usually more preoccupied with the business which had brought them to Japan, whether as members of early diplomatic missions, officers serving on the naval vessels which provided them with transport and protection, merchants, or missionaries. Those who came to Japan before 1860 with the specific object of photographing the country and its people were in a minority, such as the American artist Edward Meyer Kern, who visited Japan as part of a hydrographic survey of the North Pacific undertaken by the United States Navy between 1853 and 1856, and the Swiss photographer Pierre Joseph Rossier, who visited Japan on at least two occasions in 1859 and 1860 to take photographs for the London photographic firm Negretti and Zambra.

The first professional photographer who actually took up residence in Japan was the American Orrin Eratus Freeman (1830–1866), who appears to have arrived in Yokohama early in 1860, followed by William Saunders in 1862 and Charles Parker and Felice Beato in 1863. Freeman, who had previously operated an ambrotype studio in Shangahi, taught photography to one Ukai Gyokusen, who later bought his teacher's camera and photographic equipment and went on to establish his own studio in Edo in 1861, thus becoming the first Japanese commercial photographer. Several Japanese photographers served an apprenticeship of sorts with foreign photographers. The most famous was perhaps Kusakabe Kimbei, who worked as an assistant to Felice Beato and possibly Baron von Stillfried as well. By 1881, Kusakabe was operating his own studio in Yokohama and quickly emerged as a major producer of photographs of landscapes and costume studies for the souvenir trade. This route was not always easy. Stillfried, who also taught Usui Shûsaburô and Futami Asakura, soon realized that he was training up future business rivals and sought to limit the extent of his instruction accordingly.

Others preferred to study abroad in order to master techniques not yet current in Japan. Okamoto Keizô, who later succeeded to the name of Suzuki Shinichi II, went to San Francisco in 1879 to study photographic retouching at the studio of Isaac West Taber, and after his return to Japan in 1880 enjoyed considerable success as the first practitioner of the technique. Ogawa Kazumasa spent the years 1882–83 in Boston intensively studying dry-plate photography, carbon printing and collotype printing, and by 1890 had established himself as the foremost photographic publisher in Japan.

Technologically, most of the nineteenth century was taken up with catching up with photographic developments in the West, and the five decades between the

Brady, Mathew and Alexander Gardner. Members of the First Japanese Mission to the United States. *The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.*

first documented use of a camera by a Japanese in 1848 and the election of Ogawa Kazumasa as a Fellow of the Royal Photographic Society in 1895 were characterized by the steady closing of the time lag between photographic innovation in the West and its adoption in Japan. Many of the first Japanese students of photography in the 1850s struggled to master the daguerreotype process at a time when it was being rendered obsolescent in Europe and the United States by the collodion wet plate process. As contact with foreign photographers became more frequent following the opening of selected Japanese ports for trade in 1859, up-to-date technical instruction became available and the wet-collodion process enjoyed widespread usage in Japan until the end of the nineteenth century. Even as late as 1896, ambrotypes, encased in distinctive paulownia wooden boxes, remained popular as a cheap method of securing a portrait, and its American equivalent, the tintype, was never adopted. Similarly, many photographers continued to use wet-collodion negatives even after dry-plates began to be imported into Japan in the early 1880s. Indeed, the arrival of the first dry-plates in Japan proved to be something of a false start. In March 1879, little over one year after the British inventor Joseph Swan had perfected his process of manufacturing pre-sensitized negatives, free samples from the Mawson and Swan works were being circulated among selected Japanese commercial photographers. The new technology did not catch on, and most photographers, after experimenting unsuccessfully with the unfamiliar plates, continued as before. The first successful application of the process in Japan—by a Japanese photographer at least—did not occur until May 1883, when the Tokyo photographer Esaki Reiji photographed the controlled explosion of a torpedo during a naval review in the Sumida River. This memorable image served as both an advertisement for Esaki's self-claimed status as a *hayatori shashinshi*, and an encouragement to other photographers. One immediate benefit to the Esaki studio was a sudden increase in demand from parents for portraits of their children, who could now be photographed with greater ease, and by his own estimate in the following three years Esaki produced over 3,000 negatives of infants aged under 15 months old. Nevertheless, Japanese adherence to the wet-collodion process remained widespread for the remainder of the 1880s, partly as a result of the irregular quality of imported dry plates and partly of habit, and for a time even those photographers who used the new plates made a habit of taking second exposures with wet-plates as a form of insurance policy. Eventually, in 1888, the photographic supplier Konishi began to import Marion dry-plates on a regular basis and their reliability ensured

the final acceptance of the dry-plate process in Japan. Several attempts were made by domestic manufacturers to produce dry plates, but by the end of the nineteenth century most Japanese photographers still preferred to use imported plates.

In other respects, Japanese photography made quick progress following the overthrow of the Tokugawa shogunate and the establishment of a new government in the name of the Meiji Emperor (the so-called 'Meiji Restoration') in 1868.

Several branches of the new Japanese government showed an interest in the medium of photography. The Imperial Household Office commissioned Uchida Kuichi in January 1872 to take the first official photographic portrait of the Emperor Meiji (the resulting portrait, which showed the Emperor in traditional Japanese court dress, was subsequently deemed inappropriate to the image of Japan as a modern country and a second sitting had to be arranged with Uchida in October 1873, this time with the Emperor wearing a Western-style uniform). Uchida's favored position with the imperial household was further confirmed in May 1872 when he was ordered to accompany the Emperor on his seven-week tour of Western Japan, and photograph the places visited by the imperial party. By the time of Uchida's untimely death in February 1875, the court's patronage of photography had declined and remained low-key for the remainder of the Meiji Era, and although later photographers such as Maruki Riyô received occasional commissions from the imperial household, none were able to repeat Uchida's success, and the Emperor Meiji was never officially photographed again.

The official patronage of photography was more conspicuous and consistent among those departments most closely connected with Japan's modernization during the nineteenth century. The *Kaitakushi*, or Hokkaidô Colonization Office, began employing photographers after 1871 to document the development of Japan's northernmost island, and the first to benefit from this government largesse were Tamoto Kenzô, who had opened a studio in the treaty port of Hakodate in 1866, and the Yokohama-based photographer Baron Raimund von Stillfried, whose portfolio of photographs taken in Hokkaidô in the fall of 1872 was included among the exhibits sent to Austria in the following year as part of Japan's official contribution to the Vienna International Exposition. The Kaitakushi continued to allocate a large part of its budget to photographic commissions until its affairs were wound up in 1882 following a financial scandal.

After a slow start, the Army Ministry also took a regular interest in photography. In 1874, the Tokyo photographers Matsuzaki Shinji and Kumagai Shin were permitted to accompany the army on its first overseas expedition to Taiwan, and in 1876, Yokoyama Matsusaburo was appointed lecturer in photography at the Military Academy in Tokyo. Initially, the army used photography mainly as an adjunct to map-making and the documentation of Japan's nineteenth century conflicts was entrusted instead to civilian photographers who had either been specifically contracted for the purpose, such as Ueno Hikoma and Tomishige Rihei during the Satsuma Rebellion of 1877, or who had volunteered for the task, as was the case with Matsuzaki and Kumagai during the Taiwan Expedition of 1874 and Count Kamei Koreaki at the outbreak of war with China in 1894. This latter conflict gave rise to a proposal within the General Staff for the creation of a dedicated unit of army photographers, and both the Sino-Japanese War (1894–95) and Russo-Japanese War (1904–05) were documented by a combination of an army photographic unit and teams of civilian photographers authorized by the General Staff.

Although officially supported documentary photography served largely to record Japan's present, the Ministry of Education showed itself to be just as concerned in recording the past. In 1872, Yokoyama Matsusaburô conducted a survey across western Japan, photographing temples and their treasures.

A significant step towards the creation of a photography community in Japan took place in June 1889 when the first Japanese photographic association, the Nihon Shashinkai ('Photographic Society of Japan') was established in Tokyo, with the *Shashin Shimpô* functioning as its official organ. Within four years, its membership had grown from its original 56 founding members to 171 professional and amateur photographers. In May 1893 the Society hosted the first international photographic exhibition in Japan. The exhibition, at which 296 art photographs by members of the London Camera Club were displayed, was organized by William K. Burton, a professor of sanitary engineering at the Imperial University in Tokyo, who was serving as the Society's secretary and was himself a member of the Club. The exhibition attracted numerous visitors, including the Empress Haruko, and had enormous impact, introducing both Japanese photographers and the Japanese public at large to the best amateur photographic work being produced in the West at that time, and some historians date the beginning of *geijutsu shashin*, the Japanese equivalent of Pictorialism, from this event. Despite its role in popularizing photography, the *Nihon Shashinkai* by no means monopolized the subsequent wave of amateur interest. In June 1893, disagreements within the *Nihon Shashinkai,* fueled by the excitement generated by the exhibition, led a trio of photographers consisting of Ogura Kenji, Aritô Kintarô and the flamboyant Kajima Seibei to establish a rival association, the *Dai Nihon Shashin Himpyôkai* ('Greater Japan Photographic Critique Society'). The organization held regular bimonthly meetings, at which

photographs were judged by secret ballot, and quickly established an extensive regional network and its own journal in June 1894. Nevertheless, the Society, which changed its name in May 1897 to the *Dai Nihon Shashin Kyôkai* (Greater Japan Photography Association), never quite lost its elitist tone, the social composition of its membership, which was dominated by members of the upper class as much as professional photographers, serves as a reminder that by the end of the nineteenth century photography was still not yet within the reach of ordinary Japanese. Both associations appear to have ceased their activities at the end of the 1890s, when their financial backer Kajima went bankrupt, although at the same time other amateur photographic associations were being established on a local level across Japan and its growing empire, and by 1902, photographers in Tokyo, Osaka, Kyoto, Kobe and even Taiwan had formed their own organizations.

It was the rise of the amateur photographer in the 1890s that gave permanence to the photographic journals that had begun springing up sporadically in Japan two decades before. Japan's first photographic journal, the elegantly named *Datsuei Yawa* ('Night Conversations Fleeing from the Shadows') was published in 1874 by the Tokyo-based photographer Kitaniwa Tsukuba but lasted for only three issues. It fell into limbo for six years until another Tokyo publisher took up the baton in April 1880 and reissued it under the new name of *Shashin Zasshi* ('Photographic Magazine'). Despite extending its circulation beyond the Tokyo area, the new journal lasted for only seven issues and ceased publication in 1881. In the following year, another Tokyo photographer, Futami Asakuma, established the *Shashin Shimpô* ('Photographic News'), which lasted for 18 issues and almost two years until it folded in July 1884. In February 1889, the title was resurrected by Ogawa Kazumasa and proved more lasting under his custodianship. By the fall of September 1896, no fewer than four photographic journals were in existence, including the *Shashin Shimpô* and the *Shashin Geppô* ('Monthly Photographic Journal'), which had been established in February 1894 by Konishi Rokuhei, a prominent photographic supplier (the present-day Konica). Both journals would continue publication until December 1940.

By 1900, Japanese photography had not only closed the technological gap with the West but had also established itself as part of Japan's modernisation. There is perhaps no better contemporary statement of where Japanese photography stood on the eve of the twentieth century than William K. Burton's assessment delivered to the readers of *The Practical Photographer* in September 1896:

'It is not too much to say that, till about eight years ago, the technical difficulties that the Japanese photographer had to contend against were so great, that his attention was taken up with these alone, and that he had no superfluous mind or energy left to grapple with the artistic side of the subject… It will probably not be generally granted that the photography of the Japanese of the present day is up to the level of the best Occidental photography, so far as artistic merit is concerned, but if the present rate of improvement be maintained, what is to be looked for twenty years hence, or it may be fifty, or even a hundred? I for one would not be surprised to see Japan excel all other countries in the matter of photography as an art.'

Sebastian Dobson

See also: Brown Jr, Eliphalet; Ueno Hikoma; Kern, Edward Meyer; Rossier, Pierre, Negretti and Zambra; Beato, Antonio; von Stillfried und Ratenitz, Baron Raimund; Wet Collodion Negative; and Swan, Sir Joseph Wilson.

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JENNINGS, WILLIAM NICHOLSON (1860–1946)

American photographer

William Nicholson Jennings, a Philadelphia commercial photographer, was born on 16 November 1860 in Yorkshire, England to wool merchants William Jennings and Sara Ann Palmer Nicholson. An aerial and progress photographer, an active member of the Franklin Institute, and one of the founders of the American Museum of Photography, Jennings took up photography as a hobby, using his camera as a scientific tool to capture the world's first picture of lightning on 2 September 1882. From 1885–1896 he worked as a Pennsylvania Railroad photographer, documenting construction sites and damaged infrastructure, including the wreckage

caused by the Johnstown Flood of 1889. In 1893 Jennings successfully shot the first four panoramic, aerial photographs of Philadelphia from a free floating balloon. In 1896 he assisted inventor and photographer, Frederick E. Ives, with the development of Kromskop color photography and opened a Kromskop sales studio in Philadelphia in 1899. After the failure of the business in the early 1900s, Jennings operated a commercial studio taking post card pictures and high-angle progress photographs of Philadelphia buildings. In the 1910s Jennings was appointed official photographer during World War I by the U.S. government to document military camps and railroad construction. Actively working as a photographer until retirement from his studio in 1936, Jennings died on 9 September 1946.

LINDA WISNIEWSKI

JEUFFRAIN, PAUL (1809–1896)

French photographer

One knows few things about Paul Jeuffrain, and the biographical material available to draw a clear portrait of him is very short.

Paul Jeuffrain, son of Augustin Jean Jeuffrain and of Marie Crémière, was born in Tours (France) on 5 March 1809. He was 9 years old when his family settled in Louviers. In 1818, Jeuffrain mad his début in the local textile industry. Indeed, the father immediately began to work as a cloth's manufacturer and mill owner for the Poitevin et Thévin factory, which took later, in 1828, the name of Viollet-Jeuffrain, and later on, in 1858, became Jeuffrain and Co. In 1829, Paul had not joined the family industry yet, as the military archives prove it, mentioning his presence in Paris as a proofreader. Though many sources allocate to him a career of naval officer, some others maintain on the contrary that he would have been exempted from military service for frailty of constitution. As Michel Nattier has noted, Jeuffrain has probably travelled for a while in the merchant navy. This is particularly interesting in that it reveals already the young man's taste for exotism and travelling, taste that has not failed afterwards, and was closely connected in his practising of photography.

But, in 1834, Paul Jeuffrain, aged 25, had come back to Louviers, as mentionned in the trade register, where he is marked as being a cloth manufacturer. Associated to his own brother Augustin and married to his cousin Aurélie Crélière, he took the family business over, which, quite flourishing, ensured a comfortable life for him.

One does not know much more about his professional or private life, because remarkably little information about this period has survived. On the other hand, he has passed on to posterity some splendid calotypes, realised during two journeys, one in Italy in 1852, the other in Algeria in 1856.

But how did he arrive to calotype? In spite of any certainty, it is possible however to make some assumptions, for instance in concern with the role played by his career in the textile industry. Because the fact of being part of this milieu, in full expansion, in full technical revolution, has for an evidence made him sensitive to the notions of progress, invention, to the world's unfolding industrialization, and particularly to the increasing part of machines and modern technical devices.The nascent photography was completely in such dynamics; during those first years, it was still especially of the concern of inventors keen on science and art, rich enough to engage in the long and expensive operations required by the photographic protocol. Jeuffrain is one of those, bourgeois half artist, half inventor, his comfortable social position seeming to have allowed him to venture to the pleasures and experimentations of the new born invention. New born indeed, since Jeuffrain's first photos date back to 1849, as revealed by the album conserved in Paris by the *Société française de photographie* (all the images, that is to say this album and the travel negatives had been given to the Société by Jeuffrain's son. The only genuine positives are those of the album), album he made all by himself, combining his own images with those of others great users of the new medium: prints from Hippolyte Bayard, among which some of Louviers dated 1851, proofs of a probable meeting between the two men before 1855; also prints from Roger Fenton, member of the Photographic Society (1853). This album, like those realized at the same period by Hippolyte Bayard or Victor Regnault, clearly attests the climate of emulation, of exchanges, of friendly and fruitful meetings between photographers. It is all the same difficult to understand the kind of relationships Jeuffrain might have had with others amateur calotypists before 1855, even if this album's existence tends to prove he had already met or been in touch with some of them, french and british (Fenton, who was a student in the painter Delaroche's studio between 1841 and 1843, by the side of Charles Nègre, Henri Le Secq and Gustave Le Gray, could have met Jeuffrain during his stay in Paris in winter 1851–1852). In 1852 he took his first travelling photographs, in Naples (his second "photographic journey," in Algeria, dates, as for it, from 1856), but he was not a member of the *Société Héliographique* at that time. It is only in 1855 that he became a member of the *Société française de photographie*, created on 15 november 1854 after the dissolution of the *Société héliographique*, and remained untill he died in 1896. However, he joined on the invitation of the new society itself, since it proposed him in 1855 becoming a founder member, which testifies that his works were known and appreciated in the closed circle of photography's

pionneers. Besides, while he was tooking photographs in Naples in 1852, others were practising elsewhere in Italy. Indeed, the Cafè Greco in Rome was since 1850 a place for meetings and exchanges between French, English and Italian calotypists. Maybe Jeuffrain had met some of them while travelling.

Jeuffrain's place in the history of primitive photography is difficult to understand since informations are rare, and one can only conjecture. He seems to have stayed in the background—his photos for instance have never been shown in the numerous exhibitions of the Société française de photographie—and in the same time, to have really shared the desires and research of the period, the dreams of improving and testing the possibilities of the new invention.

To take an active part in this history implied an experimental standpoint, standpoint that Jeuffrain seemed to have adopted from a technical point of view as well as iconographic or aesthetic. His various experiments of processes, on different papers, on glass, as his few publications concerning technical points prove well such an investment. But the aesthetic concerns appear to have got the upper hand, since he quickly chose the exclusive use of calotype. Paper gives images a finish close to drawing, a *sfumato* effect, which make photography a fine art object. As some of his contemporary calotypists, Jeuffrain seems to have been very early conscient of a specificity of the medium, and thus, of photographic images themselves. His calotypes from Italy and Algeria reveal a new approach of reality, a more analytic vision of the world, and in the same time, a taste for the picturesque, for compositions tinged with nostalgic poetry, where the slightness of light and the silence of desert spaces sometimes border on oddness. So has he photographed italian squares and Algerian streets without any human presence, dramatized by the chiaroscuro plays and the hazy halo peculiar to calotype. Jeuffrain's attitude fits in perfectly with a climate of craze for exotism, travelling, linked to a renewed interest in past and archeology.

He has otherwise taken some beautiful portraits, men and women, alone or in group. But above all what is perhaps the most striking in all these images, is the recurrence of a nearly spectral motif: many of them indeed record the trace of a movement—that of a body moving too fast for the long exposure of calotype, or of boats in a bay—imposing a ghostly dimension, which can not only be attributed to the hazards of the shot, but is rather the sign of a curiosity for a peculiar photographic effect, and a peculiar aesthetic.

Jeuffrain died in 1896, leaving his son caretaker of his posterity. As far as one can judge, all his production is contained in those few hundred photographs; as for the rest—private life or others works—it stays a complete mystery, the same which radiates from some of his images, as the sign or signature of a secret personnality.

Amélie Lavin

Biography

Paul Jeuffrain was born in Tours (France) on 5 March 1809. He might have been travelling for a while in the merchant navy, then in 1834, he came back to Louviers to work as a cloth manufacturer. Associated to his own brother Augustin, he took the direction of the cloth' family factory, "les Etablissements Jeuffrain." He married his cousin Aurélie Crémière in 1834, but she died a few month after the wedding. He married again twice, once with Elisa Alphonsine Lefort, then in 1856 with Victorine Anna Thenon. He began with photography around 1849, and made then two journeys in Italy and Algeria in 1852 and 1856, from which he took back some beautiful calotypes. Founding member of the *Société française de photographie*, created in 1854, he has never been part of the numerous exhibitions organized there. Nevertheless remained he a member of the society until his death in 1896, society which conserves all his calotypes and his *Album* since 1914.

See also: Calotype and Talbotype; Société française de photographie; and Société héliographique française.

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JOCELYN, LADY FRANCES (1820–1880)

Aristocratic British woman photographer

Lady Frances Elizabeth Cowper was born in England in 1820, the youngest daughter of Earl and Lady Emelia Cowper. The Earl died in 1837 when Frances was 17 and two years later her mother married Viscount Palmerston who was to become Prime Minister of England. The Palmerston residences of Broadlands, Panshanger and Cambridge House became the setting for major social

and political gatherings that also served, as Lady Palmerston noted, "to amuse Fanny [Lady Frances]."

Queen Victoria took considerable interest in the Palmerston family and invited Lady Frances to be one of twelve young women to carry her wedding train in 1840. The following year Lady Frances herself was married to Viscount Jocelyn, the eldest son of the 3rd Earl of Roden, who had recently returned from military service in India and China. After their marriage, Viscountess Jocelyn continued to be associated with the Royal Court and was appointed an Extra Woman of the Bedchamber in 1842. Four years later the Jocelyns moved to Northern Ireland to Viscount Jocelyn's ancestral estate. They had six children before the Viscount contracted cholera in 1854 when stationed at the Tower of London and died. Following his death Viscountess Jocelyn and her children returned to England to live with her mother.

In 1858 Viscountess Jocelyn began to take photographs. It is possibly that she learnt the skill from Lord Dudley de Ros, a member of the Royal Court and amateur photographer who took portraits of the Royal Family and court circle, including Viscountess Jocelyn. Other photographers of her acquaintance included Dr Ernst Becker, who had instructed the Royal Family on photography in the 1850s, and Graham Vivian, a family friend who was a member of the Photographic Society and visited and photographed the Palmerstons in 1858. By 1861 Jocelyn had joined the Photographic Society of London and accompanied the Queen and Prince Albert to a view an exhibition there that same year. In 1862 she had developed enough confidence in her own work to submit several landscape photographs of the grounds of Broadlands to the International Exhibition, London where she received a honourable mention for "artistic effect." She continued her involvement with photographic associations until the late 1860s with one of her works included in a group Amateur Photographic Association album in 1867.

However, the main outlet for Jocelyn's talents was in the private not public arena. In common with other aristocratic amateur women photographers, such as Lady Milles and Lady Filmer, Jocelyn carefully assembled photographic albums with her own and commercially bought photographs. The impetus to create such albums may have come, at least in part, from the enthusiasm of Queen Victoria who had a well-known passion for assembling and viewing albums of photographs. A few of the aristocratic women of the Royal circle, Jocelyn included, extended this practice to include inventive photographic montages often incorporating watercolour and drawing. As the audience for these albums was presumably limited to friends and family considerable creative freedom existed when constructing and manipulating family and personal narratives. Their work also differs from mainstream nineteenth century practice in its lack of concern for the 'integrity' of the photographic image which is cut up and over-painted where desired and for their disruption of conventional notions of authorship with the frequent use of commercial photographs as the raw material for their own designs.

In the 1860s and 1870s, Jocelyn created at least six large photographic albums that operate at the nexus of creative expression, personal biography and social history. In one of her major albums (held by the National Gallery of Australia, Canberra), Jocelyn's arrangement of photographs of her family and their homes establishes the continuity and solidity of aristocratic family life. This view is established, in part, through the placement of photographic portraits of family members in hand drawn designs that emphasise permanence and interconnectedness—such as diamond and honeycomb shapes. Jocelyn also frequently includes flowers carefully selected for their symbolic language such as filial devotion and love.

While these portrait montages are largely assembled from commercial photographs, Jocelyn's albums also include her own photographs. The NGA album contains a discrete section titled, "Bygone Hours by the Viscountess Jocelyn," in which Jocelyn and her children pose on the terrace and enclosed courtyard of her house at St Leonards. There is little spontaneity about these images with the participants adopting carefully rehearsed postures as they read, embroider or spin wool. The sense of stasis in these domestic tableaux is reminiscent of the work of her contemporary, Viscountess Hawarden, who similarly created scenes within enclosed domestic spaces.

Jocelyn also created inventive and, at times, whimsical montages constructed from her own and others photographs. In one image she place photographs of babies and young children in a hand-drawn tree, complete with nests, thus playing on the notion of the family tree. Other album pages are more formal and show her inventive design sense with motifs including jewellery, Japanese screens, letters with photographic 'stamps,' and a stained glass window design comprising portraits of men in naval uniform and small head of women mimicking carved gargoyles. Often these album pages are only partially completed suggesting that the process of assembling albums was a lengthy and thoughtful one.

Writer Eugenia Parry Janis has noted "the psychological directness" of collage work produced by aristocratic women photographers and a number of Jocelyn's photographs appear to refer to her own life. In the 1870s her family was dogged by tragedy with all six of Jocelyn's children eventually dying of tuberculosis. A sense of personal vulnerability is apparent from one of her most intriguing collages, a hand-drawn archery

target in which Jocelyn has positioned herself as the "bulls-eye" surrounded but not hit by arrows.

By the mid 1870s, Jocelyn's interest in photography seems to have diminished and she spent much of this time travelling to various English and French seaside resorts with her children in search of health. However, all of her children were to die before Jocelyn's own death in Cannes, France on 24 March 1880.

ISOBEL CROMBIE

Biography

Viscountess Jocelyn (nee Cowper) was born in England in 1820. After the death of her father in 1837 her mother married Viscount Palmerston, one of Queen Victoria's closest advisers. Lady Frances was a bridesmaid at the Queen's wedding in 1840 and was appointed Extra Woman of the Bedchamber in 1842. Lady Frances married Viscount Jocelyn in 1841 and they moved to his family estate in Northern Ireland. They had six children before the Viscounts' death in 1854. Viscountess Jocelyn began to photograph in 1858. She became a member of the Photographic Society of London in 1861 and the Amateur Photographic Association in the 1860s. In 1862 she received an honourable mention for her landscape photographs from the International Exhibition, London. However the main arena for her photographic work was her private albums, where she placed her own and commercially produced photographs. Jocelyn frequently constructed montages of these photographs, hand decorating them with watercolour and drawings. She died in France in 1880.

See also: Hawarden, Viscountess Clementina Elphinstone.

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JOCELYN, WILLIAM NASSAU (1832–92)

British amateur photographer

William Nassau Jocelyn took the first dateable photographs in Tokyo and the first wet plate collodian photographs in Japan. In 1857, Lord Elgin had been appointed to head a British mission to China. During a break in negotiations, Elgin headed over to Japan and spent most of August, 1858 concluding a Treaty with that country, before returning to China. Jocelyn, an amateur photographer and member of the British aristocracy, joined the Mission in Shanghai on July 28th, 1858, just three days before it left for Japan. His appointment was as assistant secretary and official photographer; he succeeded a Robert Morrison who had held the position since April 1857. Jocelyn took photographs of the Japanese Commissioners who had negotiated the Treaty in Edo (Tokyo) in August 1858. He also used the Government's photographic apparatus when the Mission returned to China. Around ten of Jocelyn's photos from the Mission have survived, seven of China and three of Japan. They can be found in the print room of the Victoria & Albert Museum, London. All are in poor condition with significant fading and/or defects. No research appears to have been done on Jocelyn's life and details are very sketchy.

TERRY BENNETT

JOHNSON, WALTER ROGERS (1794–1852)

Walter Rogers Johnson was Professor of Physics and Chemistry in the Medical College at the University of Pennsylvania when he returned to America from Europe having acquired a complete daguerreotype apparatus—probably from Giroux in Paris.

The newspaper *United States Gazette* carried a report of his acquisition on October 22, 1839, and he had begun experiments with the apparatus by early November, marking him as one of America's first daguerreotypists. Recent research suggests he may have successfully made portraits before the end of 1839. By January 1840 he was giving public lectures on the process in Philadelphia, illustrated with his own daguerreotypes of local landmarks. In the *United States* Gazette, on January 31, 1840, Johnson announced that he would exhibit "various samples of the art produced in this city [Philadelphia], including landscapes, interior views, statuary and objects in natural history." A fine whole plate daguerreotype by Johnson, from February 1840, survives in the Smithsonian Collection, showing a laterally reversed view of the Merchants' Exchange in the city, the construction of which had been completed only four years earlier.

Surprisingly, given his initial enthusiasm for the medium, Johnson appears to have abandoned photography completely before 1843, devoting the remainder of his life to his scientific interests.

He died in Philadelphia in 1852.

JOHN HANNAVY

JOHNSTON, FRANCES BENJAMIN (1864–1952)

In her Obituary in *Time* magazine in 1952, Frances Benjamin Johnston was remembered as a 'onetime news photographer who had an inside track to the White House because of her friendships with Presidents Harrison, McKinley, and Theodore Roosevelt… With a box-like camera given to her by George Eastman in 1887, she snapped such shots as McKinley on the eve of his assassination.' McKinley died in 1901 actually only 17 minutes after she had taken the photograph, and by that time Johnston, already widely recognised as an accomplished photographer, would have been using much more sophisticated equipment.

Born in Grafton, West Virginia, on 15th January 1864, she studied art in Paris in 1883 to 1884 before returning to America to continue her studies in Washington.

Her photographic output throughout the late 19th and early 20th centuries was wide ranging and embraced portraiture and documentary, architectural, and even subterranean photography in the caves of Kentucky.

An accomplished writer as well as a photographer, she produced many influential articles about architecture, photography, and photographers, over a career lasting more than fifty years. Amongst those, a series on the foremost women photographers of the period in America, published in the *Ladies Home Journal* in 1901–1902, included essays on Gertrude Käsebier, Eva Watson-Schultz, and others.

John Hannavy

JOHNSTON, JOHN DUDLEY (1868–1955)

John Dudley Johnston is remembered both for his influence on the sesssionist movement in Britain and as architect of the Royal Photographic Society collection. Revered during the first years of the 20th century for subtle depths of his gum platinum prints—such as the minimalist *Valley of the Dragon* (1909), Johnston was an influential member of the Linked Ring and associated with foremost photographers of the period in both the USA and Europe.

Johnston was born on 23 April 1868 at 42 Arnold Street, Toxteth Park, Liverpool. He was the son of John Glynn Johnston, a general merchant and his wife Laura Dudley, by whose former surname he was known. Dudley Johnston was the eldest of six children. The family stayed briefly in central Liverpool before moving on to Seaforth and in 1877 to "Inglewood," Sandon Park, Wavertree—on the outskirts of Liverpool. Johnston left school in 1883 to become a company clerk in Liverpool and by 1901 he was established as a merchant in India Rubber with Messrs Heilbut, Symons & Co at 9 Rumford Street. He married Edith Maud Barker in 1897 and set up home at 76 Huskisson Street in central Liverpool, where he lived for 14 years. Before his marriage, Johnston, an able clarinet player, was very active in the Liverpool Orchestral Society and later played with the Halle orchestra. He was the Liverpool correspondent for *London Musical Courier* through which he developed many contacts in other parts of the country. He resigned as correspondent in 1897—much to the regret of the Editor. Johnston was becoming deeply interested in photography inspired particularly by a trip to Norway in 1893, which he recorded with a camera.

Already a giant of the northern photography movement before he moved to London, Johnston exhibited at the Northern Photographic Exhibition at the Walker Art Gallery in 1904. The first Northern Exhibition had been held in 1901 and subsequently exhibitions were held every three years in Liverpool, Manchester or Leeds. With its rotating venues, trade display and evening lantern lectures, the Northern was considered the most comprehensive of the pre-First World War exhibitions. It was to become a national beacon for pictorial photographers with exhibitors such as Horsley Hinton, Charles Job, Chas Inston, Alex Keighley, F.J. Mortimer and Frederick Evans and, latterly, Hoppe and Dührkoop.

Johnston became increasingly active in the Northern exhibitions and with the instigating institution, the Liverpool Amateur Photographic Association—one of the oldest photographic organisations in Britain. Johnston's own work was revered not only for its impressionistic technique and exploitation of innovative photographic process, but also for his vision in capturing the solid monumentality, civic pride and industry of the north. For example, in *Liverpool an Impression* (1911), a horse drawn carriage disappears into the fog at the side of the Royal Insurance Company's building—contemporarily considered the most important example of commercial architecture in Liverpool, while *Manchester—an Impression* (1906) reveals a sublime beauty in a canalised river closed in by waterside mills and scaffolding. At the tiem of the 1907 exhibition, Johnston was a member of the Exhibition Committee and Vice President of Liverpool Amateur Photographic Association, by 1911, he had risen to become President and also Chair of the Northern Exhibition Committee. He was elected to the Linked Ring in 1907 in which he rapidly became active and influential. As with music, he networked beyond the three cities of the Northern Exhibition and not just to London: George Good, photographer and author of *A History of the Liverpool Amateur Photographic Association* (1953) recalled how Johnston took a party of Liverpool photographers south to meet a group of Birmingham photographers and observed 'a memorable collection of photographic talent indeed'.

In 1911 Johnston made a career move to London. On his arrival, he immediately involved himself with

the Royal Photographic Society of which he had been a member since 1907. He participated actively in exhibitions and the organisation of the society—he was twice president from 1923–25 and 1929–31. Exhibition labels on the reverse of some of his prints in the RPS collection evidence the breadth of his work and also provide an itinerary of early 20th century exhibitions. His sensitively lit nudes and portraits of the late 1920s recall the meeting with his second wife Florence and a move from process to pattern. The role of pattern is particularly noticeable in *Snow Roofs* (1923) and in other snow scenes of the same period and, later, in scenes such as *Arabesque* (1940), a dappled, sunlight, open market made from an elevated viewpoint.

Of equal, if not greater importance, is Johnston's role in revolutionising the collecting policy of the RPS. He believed that it was vital to the study of photography to be aware of what had gone before. In 1923, as President of the RPS, he initiated the role of curator. By his own account, he built up the collection of photographs from about 100 prints to 1500 prints. The strengths of the collection are based on his personal contacts, his search for knowledge of the process of photography, his dedication to the society and his continued involvement in collecting. His vision for the collection was to dominate the next 50 years: his collecting policy and stewardship of the collection was continued into the 1970s by Florence Johnston.

After his retirement from business, Johnston embarked on a history of the RPS. *Story of the Royal Photographic Society* was not just an account of the Society, it was a history of photography—an exploration of the fifteen years before his own birth. Johnston continued to maintain a high profile through his ongoing enlargement and care of the RPS collection and because of his popular lectures—Switzerland, Bavaria and Italy, a lecture tour on the Grand Canyon- always illustrated by his own, widely admired series of slides.

Dudley Johnston died in Paddington, London in 1955.

CAROLYN BLOORE

See also: Royal Photographic Society; Dührkoop, Rudolf and Minya; Evans, Frederick H.; and Brotherhood of the Linked Ring.

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JOLY DE LOTBINIÈRE, PIERRE-GUSTAVE GASPARD (1798–1865)

Pierre-Gustave Gaspard Joly de Lotbinière was a merchant, landowner, traveller, daguerreotypist; born Geneva, Switzerland, 1798; died, Paris, France, 1865. In 1828, Swiss-born Pierre-Gustave Gaspard Joly, a wine merchant from the Epernay region of France, married Julie-Christine Chartier, heiress of the seigneury of Lotbinière, on the south shore of the St. Lawrence, not far from Quebec City. In August 1839, he was in Paris about to embark on the Grand Tour, and like others was caught up in the "daguerreotypomania" that followed the disclosure of Daguerre's process. Equipped by Paris optician N.-M.P. Lerebours to take daguerreotypes on his travels, Joly de Lotbinière became the first to photograph the Parthenon in early October 1839. He then continued to Egypt where he travelled from Alexandria as far as the First Cataract in company with fellow traveller-daguerreotypists Horace Vernet, the Orientalist painter and Director of the French Academy in Rome, and Frédéric Goupil-Fesquet, his nephew. His journal and an annotated list of daguerreotypes taken on his travels indicates he took more than forty daguerreotypes in Egypt and another twenty-six in Jaffa, Jerusalem, Damascus, and Baalbek before returning to Paris by way of Rhodes and Turkey. His original plates are not known to have survived; however, five of his daguerreotype views of Greece, Egypt, and Syria were published as engravings in Lerebours' *Excursions daguerriennes* which appeared in instalments between 1840 and 1844; others were engraved for Hector Horeau's *Panorama d'Égypte et de Nubie*, published in Paris in 1841.

JOAN M. SCHWARTZ

JOLY, JOHN (1857–1933)

Inventor

John Joly was born in Bracknagh, Offaly, Ireland on 1 November 1857. His father John Plunket Joly was Rector of Clonsat (Offaly) and came from an influential family of French descent. His mother Julia, Comtesse de Lusi was born in Castlejordan, Meath. After his father's death in 1858 Joly's family moved to Dublin where his education was entrusted to a tutor, John Charles Mahon. His formal education began at the Protestant Rathmines School in 1872. He spent a year in France for health reasons prior to his entrance into Trinity College Dublin in 1876. He was conferred a Bachelor of Engineering in 1882. After graduation he was appointed to the College's Engineering Department where he was to gain a reputation as an inventor of scientific instruments.

In the late 1880s he became interested in the application of photography to the various sciences and to astronomy in particular. He was a member of the

Photographic Society of Ireland from 1890. Joly was commissioned by Arthur Rimbaud, Director, Dunsink Observatory, County Dublin, to design camera shutters which would overcome the difficulties associated with stellar photography. On 18 November 1891 his findings in this area were read to the foremost scientific research body in Ireland, the Royal Dublin Society, of which he was a Fellow and later President. His other early publications on photography included an examination of the effect of temperature upon the sensitiveness of photographic plates.

Yet it was within the field of colour photography that he was to produce his most innovative work. Joly's process followed on from earlier research undertaken by James Clerk Maxwell, André Louis Ducos du Hauron, Charles Cros and Frederick Ives. Maxwell and others had already experimented with additive processes based upon the principle that all the colours of light can be made by combining different proportions of the three primary colours. However, none of the previous solutions had resulted in a colour image which could be observed without the assistance of a viewing apparatus. Joly announced his process in the *Photographic Times* of 23 November 1894 and patented it in the same year. His method required only a single filter and was the first screen plate process to be made commercially available. Essentially, it involved the scoring of a series of fine coloured lines onto a single glass plate through which the image could then be taken. After development and reversal of the photographic plate it was viewed through a similar filter and resulted "in vivid colour with all the realism and relief conferred by colour and colour perspective."

Joly gave a more detailed account of his discovery in a paper read to the Royal Dublin Society on 26 June 1895. In it, he referred to Hermann W. Vogel's work on the sensitising of photographic emulsions to the green and yellow portions of the spectrum and to Ives's images which consisted of three superimposed colours. Lithographic reproductions of Joly's process appeared alongside the published paper. An additional note refers to the early work of du Hauron and the fact that in 1869 he had suggested the use of a lined screen similar to that used by Joly. The note infers that du Hauron's suggestions were not acted upon as his theory of colour was flawed. In 1894, Joly's process received coverage in the French periodical *Les Inventions nouvelles* and was noted and acknowledged by du Hauron in the *Photo-Revue Africaine* on 1 April and 15 May 1895. In the same year Joly was to exhibit his colour photographs at the Royal Dublin Society whilst a group of American businessmen established the *Natural Colour Photo Co.* in Great Brunswick Street, Dublin, with a view to producing the screens commercially.

Unfortunately Joly was to encounter legal difficulties as an American, James W. McDonough, of Chicago, had arrived upon a similar process which involved the coating of a plate with coloured particles of powdered glass. As a result of these legal problems Joly was required to visit the United States in September 1895 and again in March and July of 1896. McDonough whose process was patented in England in 1892 also manufactured his plates commercially. However, his method was expensive to produce and his firm the *International Color Photo Company* went bankrupt.

Likewise, Joly's process did not achieve the widespread acceptance which he had hoped for. He encountered technical difficulties which hampered commercial production of the screens and the failure to produce colour prints on paper limited their appeal. The first truly successful commercial colour process, the Autochrome, did not appear until 1907. It was invented by August and Louis Lumière in 1903 and was also a three colour additive process. The mosaic screen was made of minute grains of starch which had been dyed and strewn onto a plate. Its success was partly due to the commercial strategies employed by the brothers and the excellent results which were achieved by their factory produced plates.

Joly did not lose interest in photography and was to apply for over 40 photography related patents in Britain, the United States and France during the period 1868–1903. He was President of the Photographic Society of Ireland from 1902–1903. On 11 February 1896 he exhibited his X-ray photographs, the first such taken in Ireland, to the Dublin University Experimental Association. This interest was the foundation of his work on radiation. In 1897 he was appointed Professor of Geology and Mineralogy in Trinity College, Dublin a post which he was to hold for 36 years. In 1914 he developed a method of radium therapy which was subsequently used for cancer treatment around the world. He continued to publish widely in the fields of botany, mineralogy, geology and experimental physics. He also worked to improve conditions for the students to whom he gave weekly lantern slide shows until his death on 8 December 1933.

The National Library of Ireland holds over half of the extant Joly slides in its Photographic Archive. Many of the 306 slides depict botanical specimens but other subjects include landscapes, printed advertisements and portraits. Joly material is also held by the Science Museum, London; the Physics Department, Trinity College, Dublin and the Kodak Museum, Harrow, London.

ORLA FITZPATRICK

Biography

Joly the scientist, educator and photographer was born in Bracknagh, County Offaly, Ireland in 1857. His father John Plunket Joly, Rector of Clonsat (Offaly) came from

an influential family of French origins whilst his mother Julia, Comtesse de Lusi was born in Castlejordan, Meath of German extraction. His relations included the Royal Astronomer, Charles Jasper Joly and Jasper Robert Joly, a founder of the National Library of Ireland. He was educated in Trinity College, Dublin from 1876 to 1882 where he was to remain as a lecturer, professor and fellow for the rest of his life. He became interested in the application of photography to the various sciences and to astronomy in particular in the late 1880s. However, he was to make his greatest contribution to the field of colour photography. His additive process which was patented in 1894 was the first successful method of producing colour from a single plate. Although his method was supplanted by the Lumière Brothers Autochrome process he was to retain an interest in photography. He continued to publish widely in the fields of botany, mineralogy, geology and experimental physics making a considerable contribution to the field of radiation treatment. He died in Dublin on 8 December 1933 and is buried in Mount Jerome Cemetery, Dublin.

See also: Maxwell, James Clerk; du Hauron, André Louis Ducos; Cros, Charles Emile Hortensius; and Ives, Frederick Eugene.

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JONES, CALVERT RICHARD (1804–1877)

British painter and photographer

Calvert Richard Jones was born in Swansea, South Wales on 4 December 1802 the eldest of five children. He had two brothers and two sisters. His father, also named Calvert Richard Jones, and mother, Prudence, lived at Veranda, a house in Singleton Park, Swansea. About 1813 the family moved to the nearby Heathfield House. As part of the landed gentry of South Wales, Jones's father was active in civic affairs. The young Jones was educated at Oriel College, Oxford where he gained a first class degree in mathematics in 1823. While at Oxford he became a close friend of Christopher (Kit) Rice Mansel Talbot, first cousin of William Henry Fox Talbot. In 1824 Jones and Kit travelled to the Mediterranean to purchase works of art. In 1829 Jones took holy orders to take up position as rector of Loughor, a small town near Penllergaer, Wales and as lay rector of St Mary's Swansea. As a rector he performed the marriage ceremony of his friend Kit and Lady Charlotte Butler in 1835. Jones abandoned his ecclesiastical profession at the time of his first marriage on 25 July 1837 to Anne Harriet who bore their only child, Christina Henrietta Victoria Games.

Jones became a talented musician as well as a skilled draughtsman and painter in watercolour and oils. It is believed that the artist Samuel Prout gave him instruction and that he was acquainted with the marine painters John Wichelo and George Chambers and members of the Old Watercolour Society. Jones' drawings and paintings dating from the 1830s show landscapes and figures but he favoured marine subjects made around Swansea, especially ships beached or in dry harbour. The controlled and precise nature of these works suggests the use of an optical drawing aid such as a *camera lucida* or *camera obscura* though there is no evidence to prove this. However, it is clear that Jones later applied to photography the artistic methods of composition, and some of the same subject matter, that he had dealt with as a draftsman.

In February 1839 Jones learned of the photogenic drawing and calotype process through Fox Talbot's correspondence with his cousin Emma and her husband John Dillwyn Llewelynwho were friends and neighbours of Jones in South Wales. Writing to Talbot, his cousin Charlotte Traherne noted, "Mr Calvert Jones is quite wild about it and I dare say by this time is making experiments in Swansea himself." (Buckman, 21). Notwithstanding his enthusiasm for Talbot's discovery, Jones was also quick to respond to the announcement of the daguerreotype process that he also learned between 1840 and 1841. The only known example by him is a fine view of Margam castle (1841), built in 1830 by Kit Talbot (National Library of Wales). However, Jones was keen to use calotypes on his travels since the paper used was lighter than the copper daguerreotype plates and easier to prepare in advance. Talbot's patent had become available in February 1841 and by May Jones had written to Talbot wanting details. By June, Jones was practising it Italy but with limited success due to technical difficulties.

Sometime between 1841 and 1843 Jones met and photographed in Paris with Hippolyte Bayard who had independently discovered a method of forming a positive image on paper (through Jones, Bayard and Talbot were eventually introduced to each other and their respective pioneering processes). Jones persevered independently with Talbot's process until 1845 when he renewed regular correspondence with him in which Jones asked for tuition. Talbot responded by asking him on a photographic excursion to York. Jones followed up with a trip just outside London making views of Hampton Court taken on his own. The same year, he was also invited to Talbot's Reading Establishment. With renewed enthusiasm and improved technical expertise he planned an extensive photographic tour of the Mediterranean in the company of Kit Talbot and Kit's ailing wife, Lady Charlotte. Talbot hoped to gain a stock of foreign views through Jones's excursion. Paper was prepared for him at the Reading Establishment. In November 1845 he travelled to France and Malta where he experienced difficulty in obtaining essential photographic supplies locally and on order from Britain. While in Malta he was visited by the Reverend George Bridges whom he instructed in the calotype process. The trip was suddenly disrupted by the death of Lady Charlotte. However, Jones continued in 1846 to Sicily, Naples, Pompeii, Rome and Florence, returning to Britain by early June with numerous negatives.

Jones was by this time encountering financial difficulty and was anxious to sell his new negatives to Talbot. Many of his prints were made available through Talbot's Reading Establishment. However, by 1846 the venture was becoming unprofitable. Impressed by Jones's skills, Talbot asked him to manage premises in London in the hope of making a new start in a more prominent location. Jones refused but the business was eventually taken on by Talbot's assistant Nicolaas Henneman to become the Regent Street Studios. Talbot and Jones remained on good terms and his prints continued to be sold at Regent Street. Despite his hopes—and Talbot's endorsement of his work—none of Jones's pictures appeared in *The Pencil of Nature*. He continued to make photographs while travelling and views survive from France, Belgium, Italy and Ireland and in numerous British locations especially Ilfracombe, Bath, Bristol, Cardiff and Swansea.

Jones's interest in the technical advancement of calotype photography is evidenced in his correspondence with Talbot that shows how the process was refined through Jones's observations. Jones's prints reveal his experimentation with varnishing (to prevent fading), retouching and hand colouring. He was also one of the first photographers to make use of the panoramic format or 'joiners' and 'double or treble views' as he called them. In 1853 he presented a paper *On a Binocular Camera* (*Journal of the Photographic Society*, Volume 1, 1854, pp. 60-61) to the Photographic Society of London of which he was one of the first members. By the early 1850s, the calotype had been largely superseded by the introduction of glass negatives and albumen prints. Jones's last known correspondence with Talbot is from 1853.

After his father's death in 1847 Jones had gained financial independence, took ownership of Heathfield House and become involved in related business affairs and local politics largely to the exclusion of photography. He also took up a household in Brussels where his wife died in 1856. He is not known to have made any photographs after that time though he continued to paint. Jones' second marriage was to Portia Jane Smith in 1858. They had two daughters. Thereafter the family lived at Bath with frequent visits to the continent. Jones' first daughter died on 29 June 1877 shortly before her father who died at Lansdown Crescent, Bath on 7 November 1877. He was buried in Swansea at St. Mary's church.

Calvert Jones's important contribution to the development of photography is now being realised after many years of neglect following his death. He was one of the few Britons to have produced a substantial body of calotypes in Britain and abroad. His marine studies were made at a time of major transition in shipping from sail to steam and are of significant historic worth. Similar historical value can be placed upon his variety of architectural studies taken from his preferred oblique angle or as a detailed partial view. His figure studies within architectural settings and environmental portraits are unique to Jones as a photographer during the period in which he was working (and it may be noted that Jones himself likely appears in many of his own photographs). However, his most significant contribution to the early development of photography lay in his ability to fuse technical skill with artistic training, intentions and results. Jones revealed his understanding of both the simplicity and challenge of photography as an artistic medium, when he wrote to Talbot: "The best artists, to whom I have shown specimens, have been perfectly enchanted, especially with details and foregrounds and as nature is infinite, so is the supply which I could furnish: the great point being to select the proper subjects from a proper position." (Letter to W.H.F Talbot, June 9, 1846, quoted in Buckman, 29).

Martin Barnes

Biography

Calvert Richard Jones was born in Swansea, South Wales on 4 December 1802, the eldest of five children. The family were part of the landed gentry of the area. The young Jones was attended Oriel College, Oxford

where he gained a first class degree in mathematics in 1823. In 1829 he took holy orders to take up positions as a rector in Wales. He abandoned his ecclesiastical profession at the time of his first marriage in 1837 to Anne Harriet who bore their only child. Jones became a skilled draughtsman and painter in watercolour and oils. In 1839 he learned of the calotype process through Fox Talbot's correspondence with his relatives who were friends and neighbours of Jones in South Wales. Between 1840 and 1841 he also learned the daguerreotype process. However, Jones extensively used the calotype on his travels from 1841 to 1845 photographing locally in Wales and other parts of Britain and in Italy, France, Belgium and Malta. He corresponded regularly with Talbot who sold Jones's prints through his Reading Establishment. Jones took ownership of the family estates after his father's death in 1847 and became involved in business and local affairs largely to the exclusion of photography. He also took up a household in Brussels where his wife died in 1856. He is not known to have made any photographs after that time. Jones's second marriage was to Portia Jane Smith in 1858. They had two daughters. Thereafter, the family lived at Bath with frequent visits to the continent. Jones's first daughter died on 29 June 1877 shortly before her father who died at Lansdown Crescent, Bath on 7 November 1877. He was buried in Swansea at St. Mary's church.

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See also: Bayard, Hippolyte; Llewelyn, John Dillwyn; and Talbot, William Henry Fox.

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JONES, GEORGE FOWLER (1819–1905)
English photographer and architect

Being both an architect and a photographer is not uncommon but Fowler Jones remains exceptional and he notably encompasses every process from paper, glass and nitrate between the 1840s and 1900.

Born in Aberdeen and trained under William Wilkins and Sydney Smirke he practised in York from 1846: his views of the city were among the first but he continued another 50 years [using the ceroline paper negative process] frequently revisiting Scotland.

2100 well documented negatives at the National Media Museum cover domestic and ecclesiastic structures across northern England, Scotland and Ireland. His amateur eye is professionally informed by an architectural vision so his work is distinctive compared with commercial, picturesque or quick progress work. He unusually includes new as well as old buildings with singular well documented devotion—yet his only exhibition was posthumous. Neither did he publish yet his son did produce a series of drawings of York clearly deriving from photographic originals. Architectural commissions and views in Ireland prove he was active there as early as 1845 so his travels need investigation.

English Victorian architect-photographers usually fall into the amateur or dilettante categories and by the 1870s most architects utilized professional architectural photographers like Bedford Lemere so Fowler Jones stands outside the norm.

Ian Leith

JONES, HENRY CHAPMAN (1854–1932)
English chemist and author

The scientist Henry Chapman Jones was engaged in wide-ranging studies concerned with the chemistry of photography, and for many years was a regular contributor of informed scientific opinion on the emerging study of the workings of the photographic process.

He was born in London and later studied at the Royal School of Mines. In 1879, he was elected a Fellow of the Royal College of Chemistry.

Amongst his many contributions to the photographic press was a memorial lecture delivered to the Royal Photographic Society in 1920 on the work of Sir William de Wiveleslie Abney, whom he had known during his lifetime.

He was in regular correspondence with Hurter and

Driffield throughout the period of their important research into the understanding of the relationships between sensitivity, exposure and development.

Of significance is an article published in *Photography* in 1890, disputing several assertions made by H&D in their 1890 paper. This led to a heated debate with Driffield, culminating in a rift between the two men, and the publication in *The Photographic Journal* of Jones's paper 'Density ratios as affected by development,' which sought to disprove a central canon of H&D's work.

An Introduction to the Science & Practice of Photography by Henry Chapman Jones was published by Iliffe & Sons in 1888, and had reach a third edition by 1900.

JOHN HANNAVY

JUHL, ERNST (1850–1915)
Collector and curator

Ernst Wilhelm Juhl, born on December 10, 1850, one of five children, in Hamburg, Germany was to have a significant influence as collector and supporter of experiments in photography in the late nineteenth and early twentieth centuries. Juhl attended high school in Hamburg and then went on to study engineering at the Technische Hochschule in Hannover. A sketchbook with technical drawings from those student years is in the collection of the Hamburg Museum für Kunst and Gewerbe.

Following his studies, Juhl returned to Hamburg and tried without too much success to found two companies. With independent income, however, Juhl was able to marry Johanna Julie Auguste Jacoby, (Henny), the grandniece of the composer Richard Wagner. The couple had three children, a son Ernst Carl, and two daughters, Hertha and Isle.

Being well-educated, Juhl spoke several languages, enjoyed traveling and entertaining a variety of people at his home. A number of artists came to gatherings at the Juhl home, and Juhl began collecting paintings and drawings from Hamburg artists who were experimenting in modernist styles. Among those works he collected early were those of Ernst Eitner and Arthur Illies.

From the late 1890s onward, Juhl expanded his personal library to include a number of valuable art books catalogues, and portfolios. Of particular interest was a 1903 portfolio, "*Heliogravuren nach Gummidrucken von Mitgliedern der Gesellschaft*." Unfortunately many of Juhl's books and graphic works were destroyed during World War II when a bomb hit Juhl's son's house.

Through Juhl's influence and interests, Hamburg became one of the most important cities in Europe to foster the growth and development of photography. It is ironic that Juhl took very few photographs himself, but felt the medium to be a powerful and significant one for the nineteenth and twentieth centuries. He promoted the founding of the "Amateurphotographen-Vereins" and then the "Gesellschaft zur Förderung der Amateur-Photographie" (Society for the Promotion of the Art Photography).

From 1893 to 1903 with the Society for the Promotion of Art Photography, Juhl organized ten international-photographic exhibitions at the Hamburg Kunsthalle. These exhibits honored photography as an art, and had a strong influence on the photography of the Art Nouveau or *Jugendstil* period.

In 1903 the tenth, and last Annual International Exhibition of Art Photography at the Hamburg Kunsthalle, made Hamburg a focal point for experiments in Jugendstil photography. Juhl, as President of the Art Association and the Society for the Promotion of Art Photography, invited amateur and professional photographers from throughout the globe. Among them was the well-known professional photographer Nicola Perscheid from Leipzig. (Perscheid moved to Berlin in 1965.) Perscheid exhibited two large-scale allegorical wall images, entitled "Mower" and "Shepherd," as well as eight portraits.The large scale portraits are still preserved in Dresden.) Among the portraits were those such as *Portraits of His Majesty the Emperor in Hunting Dress, H.M. King George of Saxony* and *Professor Max Klinger.* (Max Klinger had recently completed the large-scale sculpture of a Zeus-like Beethoven for the opening of the Vienna Secession building in 1902.)

Not only did Juhl help organize significant art and photographic exhibitions, but he also served as a juror or commissioner for various exhibits in other major European cities: in Amsterdam (1895), Haarlem (1896), Berlin (1896), Oxford (1901), Turin (1902), Lille (1903), and Dresden (1909). He was also made an honorable member at a number of the new emerging photography clubs that sponsored photography as a valid art from—i.e., The Photo Club of Paris, the Camera Club of Vienna, and the Belgian Photography Association.

Further, Juhl, as a well respected Hamburg citizen, was able to encourage museums and private individuals to collect contemporary photography. Juhl also exerted influence by writing various articles on the new photography and serving as art director of the *Photographische Rundschau*, a position which he had to give up in 1902, because he had so enthusiastically supported the new Impressionist work of the young photographer, Edward Steichen, whose photographs had begun to look much like paintings. For some, who expected, and wished photography to retain its documentary status, Juhl's attitude and support for such experiments, was inappropriate and unacceptable.

Juhl's artist judgment, however, was largely respected and in 1908 he was commissioned to direct the organiza-

tion and planning of a "State Photographic Collection" by the Senate of Hamburg. Many of the pictures for the collection were taken by Minya Diéz-Dührkoop, the daughter of the well-known photographer, Rudolph Dührkoop (1848–1918), and Anton Joachim Christian Bruhn, who was initially a carpenter but made photography his primary profession about 1900. Bruhn's photographs of Hamburg are strong atmospheric images, many of which depict the working class of a major port city. From 1908 to 1912 over one thousand 18x24 cm. photographs were taken under Juhl's direction.

Ninety of these were put together in a portfolio in 1912. The mayor of Hamburg at the time, Dr. Johann Heinrich Burchard, was also very supportive of this project. Burchard unfortunately died a month before the project's completion. The bound portfolio, however, was dedicated to Burchard's memory. The collection was titled, "Ernst Juhl, Hamburg and the Hamburg Landscape," photographed by the Commission of the Free and Hanseatic City of Hamburg. Copies were made of the portfolio in two different editions, one bound in parchment, the other bound in a half-linen binding. Copies were for sale and used as gifts for Hamburg citizens who contributed special services to the city. The photographs taken for this project, in general, emphasized the pictorial and artistic, rather than pure documentary qualities.

Juhl's own private photography collection began in earnest, probably about 1893. His collection began to particularly expand in 1899 after he purchased a number of calotypes from James Craig Arman and work from David Octavius Hill, Robert Adamson, and Julia Margaret Cameron. A special exhibit of Juhl's collection was held in Berlin from May 8-June 30, 1910 at the Kunstgewerbe Museum. Juhl's collection, now in Hamburg's *Museum für Kunst and Gewerbe,* and Berlin contains examples of quality work from photographers working throughout the world at the turn of the century. Major names, such as Stieglitz, Steichen, Käsebier, Hofmeister, Kühn, etc. who were experimenting with various photographic techniques and content imagery, fighting for the role of photography as a significant art form, are to be seen in the collection. Due to financial difficulties for Juhl's widow, Henny, the collection was sold after Juhl's death.

Ernst Juhl died on August 16, 1915. In a commemorative statement, Dr. Willi Warstatt wrote, "Er war seiner der bedeutendesten Freunde und Forderer der Kunstlerischen Photographie, und sein Tod wird nicht nur in Deutschland, sondern auch über die Grenzen unseres Vaterlandes hinaus Anteilnahme und Trauer erregen." ("He was one of the most meaningful friends and supporters of art photography, and his death will evoke sympathy and grief not only in Germany, but far past the borders of our fatherland.")—Quoted in Rudiger Joppien, *Eine Schöne und auf dem Kontinent wohl einzige Sammlung*; *Die Sammlung Ernst Juhl* (Hanburg, Museum für Kunst und Gewerbe, 1989, 21.)

KATHERINE HOFFMAN

Biography

Ernst Juhl was born on December 10, 1850, one of five children in Hamburg, Germany. He attended the Gymnasium in Hamburg and the Technische Hochschule in Hannover, studying engineering. His attempts to work in business were somewhat unsuccessful, and following marriage to Johanna Julie Auguste Jacoby (Henny) and starting a family, Juhl became much more interested in the arts and photography. From 1893–1903 he, with the Society for the Promotion of Art Photography, which he had started, organized ten international art photography exhibitions at the Hamburg Kunsthalle. In 1902 he was forced to give up the art direction of the "Photographische Rundschau." From 1908–1912 Juhl directed the planning and organization of a State Photographic Collection by the Senate of Hamburg. He died on August 16, 1915.

See also: Photo-Club de Paris; *Photographische Rundschau*; and Dührkoop, Rudolf and Minya.

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JÚNIOR, CHRISTIANO (1832–1902)

José Christiano de Freitas Henriques Júnior was born in Portugal, in the small island of Flores, Azores archipelago, in 1832. He is known for his work in Brazil, Argentina and other South American countries. Nothing is known about his first years in Portugal where he remains unknown, he is not even mentioned in the only *Portuguese History of Photography*, written by a fellow Azorean. Even on his small island, his memory seems to be lost. Following the path of many of his fellow countrymen, he migrated to Brazil in 1855. His photographic activities started in Maceio, northeast Brazil, in the early 1860's. He went to Rio de Janeiro in 1863, where as a partner of several photographic studios, he

made some of his best known work: The *carte-de-visite* of negro slaves. These were sold as a souvenir mainly to the visiting or returning Europeans. These were a complement of a successful business as a portrait photographer. His next step led him to establish his business in Mercedes, Uruguay, and in 1867 in Buenos Aires. At that time he managed studios in three South American countries. In his Buenos Aires studio in Florida Street of Buenos Aires he photographed landowners, politicians, diplomats, the core of the Argentinean society, including the presidents: Pelegrini; Mitre, Sarmiento. In the 1870s he established a studio run by his son, José Virginio Freitas Henriques for photographing children, a difficult task in the wet collodium time. He earned a gold medal in the Cordoba National exhibition in 1871. In Argentina, as in Brazil he completed his successful portrait work with photographs of the growing city of Buenos Aires, the local costumes and other Argentinean cities. His children's studio was destroyed by a fire in 1875. He sold his studio to Witcomb in 1878, and a year latter started touring Argentina publishing photographic albums of Argentinean provinces. He retired from his photographic activity in 1883. He died in Asunción Paraguay in 1902.

NUNO DE AVELAR PINHEIRO

Exhibitions

Buenos Aires, 2002, Fundación Antorchas.

A Colecção do Imperador, Fotografia Brasileira e Estrangeira do Século XIX, Museu Nacional de Belas. Artes, 1997, Arquivo Fotográfico da Câmara Municipal de Lisboa.

K

KARELIN, ANDREY OSIPOVICH (1837–1906)

Professional photographer, artist

Andrey Osipovich Karelin was born in 1837 in the Tambov region. He was the illegitimate child of a peasant woman and a landlord. During his childhood Karelin demonstrated an inclination for painting, and at the age of ten wanted to be a master of iconic painting. The local landlord recognized his talent and in 1857, sent him to St. Petersburg Academy of Art. At the Academy, he studied with future famous artists such as I. Kramskoy, K. Makovsky and others. In the course of his studying, Karelin received two silver medals for his works.

Karelin began as a retoucher in a photographic studio and later chose to experiment with photography. Upon graduating the Academy in 1864 and receiving the qualification of an "independent artist," Karelin left St. Petersburg. In the summer he went to Nizhny Novgorod's fair and chose to stay there to work in the studio of M. Nastjukov, one of the first photo-chronographer in the Volga area.

In 1869 Karelin opened a studio of his own in Nizhny Novgorod. The photographer made portraits and multi-figured genre scenes. At first he used wet collodion, but then switched to bromgelatine plates with dimensions of 50 × 60 cm. The more perfect optical shape of the lens allowed him to achieve considerable depth of focus in his multi-figured compositions. The decisive factor affecting the scene was the light and the layout of his photos which were derived from the laws of academic painting that he studied in the Academy of Arts.

In 1870 the gentlefolks' leader of Nizhny Novgorod requested that Karelin and the well-known Russian landscape painter I. Shishkin create an album comprised of images within Nizhny Novgorod, its neighborhood, and photos of the nationalities inhabiting the region. The prints were water-colored by Shishkin and Karelin themselves. The exemplary album was presented to the Emperor Alexander II.

From 1870 to 1880, Karelin created a most interesting "Art Album of Photos from Life," which contained his studio genre pictures. The photographer photographed idyllic family life where everyone in his pictures were preoccupied with something appropriate. Some were depicted playing musical instruments while others read. Karelin was in constant search for a more effective means of expression. He experimented with sitters, costumes, and worked on composition by taking several pictures of the same scene. His primary concern in arranging the scene was to make all the elements of the composition interactive. Karelin loved to use windows as the background for his photos, thus demonstrating his mastery in lighting, making the sitters' features and the photographs' details visible through exemplifying the light and shadow of the photograph. Karelin experimented with the role of property by photographing unique objects from everyday life that he had in his varied collection, which he had been gathering for quite a while.

All the works in the album were in accordance with the laws of academic painting. Even the scenes donated to charity bore no pathos of exposure of social inequity and characteristics of injustice, which were often found in the works by peredvizhniks. Karelin tried to make photo-images less documentary by employing the method suggested by Russian photographer A. Denier. Karelin made a wide use of this technique especially in the works of considerable size, thus obtaining a soft image without needing to retouch it. M. Dmitriev, a photographer, wrote of Karelin's works: "He was the first to show how to photo groups of sitters in a studio so as to fix marvelous effects of sunlight and make the poses of sitters dainty and noble. His works were always

Karelin, Andrey Osipovich.
Conversation in the Salon.
From the Art Album of Photos from Life 1870–1880s. Private Collection: Alexei Loginov.

marked by high artistry and more to it by elaborate and subtle technical efficiency." In 1876 Karelin was given the honorary title of photographer of the Emperor's Academy of Arts. In the 1870s he worked the Nizhny Novgorod fair from his studio. Karelin successfully exhibited his works at photo-exhibitions at home and abroad. In 1873, he took part in the sixth International exhibition of pictorial photography in Vena, and in 1876 he won the silver medal at a Special exhibition of the French photography society in Paris. He also won a bronze medal at the centennial Exhibition held in Philadelphia in 1876 to mark the centenary of the foundation of the United States of America. The photograhs that he exhibited at the Edinburgh Photographic Society's Exhibition in 1876 and 1877 were very well received, and Karelin was awarded a gold medal and a diploma. In 1878 Karelin became a member of the French national academy of arts and was given a diploma from the French photography society and a gold medal at the eighth World exhibition in Paris.

Even though Karelin was very successful with photography, he never stopped painting. For more then 30 years he worked as the head and teacher of a drawing and painting school that, since pedagogy was of great importance to Karelin, gave free lessons for all students. The school had 30 to 40 students of all ages. In 1886 he, along with other local artists, organized a provincial art exhibition in Nizhny Novgorod. Some of his students such as M. Dmitriev, S. Solovjev and his son A. Karelin later became famous. Karelin's activities were not just confined to Nizhny Novgorod. In fact, he created portraits for and was friendly with people from all over

Russia. He was acquainted with scientists, musicians, writers, and artists such as D. Mendeleev, I. Kramskoy, I. Repin, and many more.

In 1886 Karelin issued his album "Views of Nizhny Novgorod." In this ablum he returned to landscape photography. The most remarkable of them were his panoramic views of the city and the Volga River. These photos were done by means of a landscape objective from the top of the highest bank of the river. The depth of space is, as a rule, highlighted by placing something in the foreground, the effect of which is strengthened by an aerial perspective. The album also comprised landscapes of city streets, monuments of architecture, separate buildings and fragments of buildings. And again Karelin built the composition of these photographs in accordance to the norms and rules of academic painting. His choice of positioning is the reason why his photographs came out so elaborately.

Karelin's creative works were widely acknowledged not only by specialists in photography, but also by the intelligentsia. His works immensely influenced the process of development of photography in Russia. In 1895 Karelin became a fellow member of the Russian photography society in Moscow, and in 1896 he became its honored member. In 1897 he was elected as a fellow member of the Emperor society of natural science, anthropology and ethnography. Finally, in 1903 at an International photography exhibition in St. Petersburg, his last ever, he won a silver medal.

In the course of his life, Karelin never stopped his altruistic activities. He died in 1906 in Nizhny Novgorod. His obituary ran as follows: "He was the first to prove by all his numerous photo sketches that art and photography are very closely connected. He proved that the fantasy of a photo-artist, his dainty taste in choosing the plot for his works might be realized through photography."

In the USSR the photo report became the main trend of the official photography, causing Karelin's work to be forgotten. Many contemporary photographers, including the commercial photographers, are more often using and developing Karelin's methods to achieve the maximum expression of the image by arranging the composition and the artificial lighting.

ALEXEI LOGINOV

Biography

Andrey Osipovich Karelin was born on July 4, 1837, in the village of Selezny in the Tambov region. He studied at the St. Petersburg Academy of Arts from 1857 to 1864. In 1869 he opened his studio in Nizhny Novgorod. He made photo–portraits and views of the city. In 1870 together with landscape painter Shishkin he created the album "Nizhny Novgorod." From 1870 to 1880 he created his "Art Album of Photos from Life" which comprised studio genre scenes of idyllic family life. He took part in and won prizes at numerous exhibitions. He taught painting in Nizhny Novgorod for everyone and he took an active part in the Artistic culture of the city. He created a large gallery of portraits of Russian scientists, writers, musicians, artists and public figures. In 1886 he issued the album "Views of Nizhny Novgorod," and thus returned to landscape photography. Karelin died in 1906 in Nizhny Novgorod.

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KARGOPOULO, BASILE (VASILI) (1826–1886)

Ottoman Greek photographer

Basile Kargopoulo opened his studio on Grand' Rue de Péra in the Ottoman capital Istanbul in 1850, and opened a second studio in partnership with E. Foscolo in the city of Edirne, then a major army base.

Kargopoulo was particularly renowned for his panoramas of Istanbul, scenes of the city and the Bosphorus, and photographs of royal palaces. He kept a large wardrobe of costumes in his studio for young men who wanted to dress up for their photographs. He became well known for his series of Istanbul types, including fishermen, greengrocers, and street vendors, such as *simit* (bagel) and sherbet sellers, sold as mounted 6 × 9 cm prints. Today these photographs are important documents recording life in 19th century Istanbul.

Kargopoulo was appointed royal photographer to Sultan Abdulmecid (1823–1861, r. 1839–1861), and was private photographer to Sultan Murad V (1840–1904, r. 1876) When Sultan Abdülhamid II (1842–1918 r. 1876–1909) came to the throne, Kargopoulo's appointment as royal photographer was rescinded because he did not take down the photograph of Murad V on his studio wall, but shortly later, he was reinstated.

ENGIN OZENDES

KÄSEBIER, GERTRUDE (1852–1934)
American photographer

Gertrude Käsebier came to photography relatively late in life and was soon among the most esteemed photographic portraitists of her day, successful both artistically and commercially. From the end of 1897 for the next thirty years, she operated a prominent portrait studio in New York City. Her work was vigorously championed by Alfred Stieglitz following their meeting in 1898, but within a decade, the two had begun to fall out over aesthetic and practical differences. Indeed, throughout her career, she maintained a determined independence, frequently holding what she termed "heretical views" with regard to prevailing commercial and artistic trends.

Married and the mother of three, Käsebier first made photographs using her family as a subject in 1885. In 1889, at the age of thirty-seven, she enrolled in the Pratt Institute in Brooklyn to study painting. Following her course of study she turned to artistic photography and, in early 1894, submitted the winning photograph to a juried contest in the *Quarterly Illustrator*. This prompted criticism from her painting masters for her involvement both with photography and with the illustrated press. In spring of 1894, she traveled to Europe, producing a series of photographs of French peasants, reminiscent of the paintings of Jean-François Millet, which she subsequently published in the *Monthly Illustrator*. In Germany, she undertook a brief apprenticeship with a chemist in order to learn the chemical basis of photography, before returning to New York in 1895.

Käsebier launched herself into professional portrait photography in 1896. After apprenticing with a commercial photographer, she opened her own studio in Manhattan in the winter of 1897–1898. Her style of portraiture dispensed with conventional props, focusing on softly lit heads against dark backgrounds. In addition to her fashionable clientele, she began photographing Plains Indians from Buffalo Bill's Wild West Company in April 1898, producing a series of remarkably intimate character studies.

Käsebier quickly made a name for herself as a pictorial photographer. In June 1898, she introduced herself to Stieglitz, leading figure in the Camera Club of New York. At the 1898 Photographic Salon of Philadelphia, with Stieglitz on the jury, Käsebier exhibited her recent work and gave a lecture on the need for an artistic approach to portraits emphasizing simplicity, naturalness, and directness. She recommended that artistically trained women take up "modern photography" as a "vocation" (Käsebier, 86).

Blurring distinctions between artistic and commercial photography, Käsebier charged a premium for her portraits and favored the fine platinum print over the popular gelatin silver print. Stieglitz enthusiastically exhibited her photographs at the Camera Club in February 1899, and in April featured them in *Camera Notes*. At the 1899 Philadelphia Salon, Käsebier served on the jury, alongside Clarence H. White and Fred Holland Day, and received praise for *The Manger*, a luminous image of a gauze-draped Madonna with child. British actress Ellen Terry would famously buy this picture for $100, an unheard-of sum for a photograph at the time.

At the 1900 Philadelphia Salon, Käsebier achieved critical acclaim for *Blessed Art Thou Among Women* (1899), an allegorical photograph of a young girl crossing a threshold into public life. Also in 1900, her work was exhibited abroad in Paris and London. In October, she and British photographer Carine Cadby became the first women elected into the elite Brotherhood of the Linked Ring. At this time, Käsebier began a series of portraits for the illustrated magazine *World's Work*, photographing such eminent figures as author Mark Twain and educator Booker T. Washington. She was achieving success simultaneously on three fronts: commercially in her portrait practice, artistically in exhibitions and photography journals, and publicly in the illustrated press.

Following a stay with Eduard Steichen in Paris in the summer of 1901, Käsebier became an ardent practitioner of the gum bichromate printing process. Subsequently, she both alternated and combined platinum and gum printing techniques in her work, experimenting with different versions of the same image. Her prints might feature crisp photographic detail or moody handling of the emulsion, depending on the situation.

In 1902, Stieglitz included Käsebier as a founding member of the Photo-Secession, and in January 1903, he devoted the first issue of the Photo-Secession's deluxe journal, *Camera Work*, to her work. In 1905, several pastoral images by Käsebier, among them, *Happy Days* (1903), were featured in *Camera Work* 10 and exhibited at Stieglitz's newly opened Little Galleries of the Photo-Secession.

The theme of women's emotional experience recurs throughout Käsebier's work. In 1902 she produced *Portrait of Miss N.*, a frankly erotic depiction of the young showgirl Evelyn Nesbit poised seductively with an open pitcher tipped toward the viewer, symbolically suggesting the girl's entry into sexual life. Two years later, Käsebier's wrenching portrait of the poet Agnes Lee, entitled *Heritage of Motherhood*, depicted a grieving mother in a bleak landscape.

The emphasis on depth of feeling in Käsebier's photographs led to divergent assessments of her work in 1907. An article by Mary Fanton Roberts (pseudonym Giles Edgerton) in the April issue of *Craftsman* praised Käsebier's investigation of "Photography as an Emotional Art." In response, Charles H. Caffin, previously a strong supporter of Käsebier, wrote a stinging satire,

published in *Camera Work* 20 (October 1907), of the self-indulgent "emotional artist." The privileged role of intuition in pictorial photography was beginning to give way to a more detached, modernist photographic aesthetic.

By 1909, Käsebier's relations with Stieglitz had grown strained over her identification with professionalism and his with non-commercialism (Michaels, 130). In 1910, in the wake of Stieglitz's International Exhibition of Pictorial Photography, tension erupted over financial matters relating to the sale of her works (Michaels, 136). Stieglitz, meanwhile, was turning his attention away from pictorial photography in favor of the machine aesthetic and modern art. In 1911, he asked for a pledge of loyalty to the new direction that the Photo-Secession was taking under his leadership; Käsebier refused. When Clarence H. White, himself an ex-Secessionist, founded the Pictorial Photographers of America in 1916, he made Käsebier honorary vice president

From the start of her career in the mid-1890s, Käsebier's critical fortunes had risen and fallen rather precipitously. What at first seemed bold and daring in her work came, in light of trends away from pictorial photography after 1910, to seem conservative (Tighe, 98). After her death in 1934, decades of relative invisibility followed. In the 1970s, however, concurrent reevaluations of pictorial photography and the neglected history of women artists led to a revival of interest in Käsebier's life and work. Subsequently, in the late 1990s, her innovative portraits of Native Americans drew renewed attention to her exceptional career.

STEPHEN PETERSEN

Biography

Gertrude Käsebier was born Gertrude Stanton in Fort Des Moines, Iowa (now Des Moines, the state capitol), on 18 May 1852, to a family of Quaker heritage. From the age of eight to twelve she, along with her parents, John W. Stanton and Muncy Boone Stanton, and younger brother Charles, lived in the Colorado Territory, where her father sought his fortune in the gold rush. After finding success in mining operations, he and his family moved east in 1864, settling in Brooklyn, New York. Käsebier attended Moravian Seminary for Young Ladies in Bethlehem, Pennsylvania, from 1868 to 1870. In 1874 she married Eduard Käsebier, a German immigrant and shellac importer six years her senior. Living first in Brooklyn and later in New Jersey, the Käsebiers raised three children before Gertrude decided to pursue a career as a painter, returning to Brooklyn to study at the Pratt Institute from 1889 to 1895. Turning in 1896 to a profession in photography, she apprenticed with Brooklyn portrait photographer Samuel H. Lifshey. Following her apprenticeship she operated a highly regarded portrait studio in New York for thirty years, before physical ailments forced her retirement. A member of the Brotherhood of the Linked Ring from 1900–1909 and of the Photo-Secession from 1902–1912, she knew and exhibited with all of the major pictorial photographers. Käsebier died on 13 October 1934 in New York City at the age of 82. Her husband predeceased her by twenty-five years. Early in her career, she published her photographs in many journals and magazines including *The Monthly Illustrator*, *The World's Work*, *Everybody's Magazine*, *Ladies' Home Journal*, and *Harper's Bazaar*. Major exhibitions during Käsebier's lifetime included the Philadelphia Photographic Salon, Pennsylvania Academy of Fine Arts, 1898, 1899, 1900; The New School of American Photography, curated by F. Holland Day, Royal Photographic Society, London, 1900; American Pictorial Photography Organized by the Photo-Secession, National Arts Club, New York, 1902; and the International Exhibition of Pictorial Photography, Albright Art Gallery, Buffalo, 1910.

See also: Brotherhood of the Linked Ring; Gum Print; Pictorialism; Platinum Print; Portraiture; and Stieglitz, Alfred.

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KEELER, JAMES EDWARD (1857–1900)

The American astronomer James Edward Keeler was born in La Salle, Illinois, and during an extended period of illness in his teens, developed a passion for astronomy. After completing his bachelors degree at John Hopkins University, he studied for two years in Europe—at Berlin and Heidelberg—and subsequently

was appointed to the staff of the Allegheny Observatory in Pittsburgh in 1884.

By 1888 he had been appointed as astronomer at the newly completed Lick Observatory in California, where he stayed for three years conducting a wide range of spectrographic experiments with the observatory's refracting telescope, before returning to the Allegheny to take up the position of Professor of Astronomy and Astrophysics.

He returned to the Lick Observatory as Director in 1898, and set about applying himself to the photography of every nebula listed in Sir William Herschel's catalogues of 1786, 1789 and 1802—two and a half thousand in number. He photographed over half of them, and in the process discovered many more.

For his photographic recordings, he used the Observatory's 36-inch f/5.7 Crossley Reflecting Telescope, imported from England where it had previously been used by A. A. Common in his garden observatory in Ealing, London. The exposure for each plate was between three and four hours.

Keeler died in San Francisco in 1900 at the age of only 42, his photographic project far from complete.

John Hannavy

KEENE, RICHARD (1825–1894)
English

Richard Keene was born in London on May 15th 1825 and his family moved to Derby in 1825 where his father managed a silk mill.

Keene was apprenticed to local printers Thomas Richardson and Sons, later moving to their London offices. He later worked for publishers and booksellers Simpkin Marshall and Co.

He returned to Derby in 1851, married Mary Barrow and set up as a printer, publisher and bookseller at 24 Irongate.

Becoming interested in photography, he started making local views which he sold commercially and exhibited 16 architectural views at the 1862 London International Photographic Exhibition.

He was known for his high quality portrait, landscape and architectural studies which he produced as albumen, gelatin silver and platinum prints. He also specialised in producing photographs on ceramic. Keene published several books about Derbyshire, was official photographer to the Midland Railway Company until 1883 and a member of the local archaeological society.

Keene was a member of the Photographic Society of Great Britain and was elected to membership of The Linked Ring on 26th July 1892 with the pseudonym 'Master Printer,' the link name reflecting the quality of his photographic printing skills.

Keene died at his home in Radbourne Street, Derby in 1894, leaving five sons and three daughters.

Ian Sumner

KEIGHLEY, ALEXANDER (1861–1947)
English photographer

Although the son of a wealthy worsted mill owner, of High Hall, Stretton, Yorkshire, Keighley had to work his way up, from shop floor sweeper to managing director. Interested in oil and watercolour painting, the influence of Henry Peach Robinson allowed him to combine these interests into photography in 1883, then he joined the Bradford Photographic Society. In 1887, with 12 prints, he was awarded first prize by Peter Henry Emerson in the *Amateur Photography* competition (Alfred Stieglitz came second). Yet Emerson lamented Keighley's sharp focus and then later criticised him for becoming a 'gum sploger.' In the end Keighley adopted the manner of soft focus Impressionism and became a leading Pictorialist with many solo exhibitions in London, USA and throughout Europe. Invited member of the Linked Ring Brotherhood 1892, Fellow of the Royal Photographic Society 1912, Honorary Fellow 1924. Often he used a quarter plate camera, without a view finder, permanently set at 10 yards and covered in a bag so that he could surreptitiously photograph people, often on his travels abroad where the majority of his photographs were made. The negatives were then made into full plate positives, then manipulated using combination printing, pencil and dyes, then enlarged onto 16 × 20" or 20 × 24" glass negatives for contact printing with carbon. In his time, his photographs were highly praised as "lyrical," "poetic," the "poetry of romance," but they have not survived well. Now they would be regarded as "sentimental," "unreal," but his reputation suffers, like many of his time, in that only the same few images are ever reproduced.

Alistair Crawford

KEITH, THOMAS (1827–1895)
British surgeon and amateur photographer

Dr. Thomas Keith's appreciation of light, and his ability to recognise its potential for powerful visual statements is evident in his small but significant body of early paper photography. Working only when working pressures permitted, he produced over two hundred architectural and landscape views.

His subject matter embraced the Closes and Wynds of Edinburgh's Old Town, wooded highland landscapes, and the romantic ruins of Iona Abbey and his last dated negatives were taken in September 1856. With his preferred soft or diffuse light, his use of angular shadows

created powerful and dynamic images. At a time when the chemical and technical manipulation of processes occupied the minds of early photographers, Keith was concerned with controlling and exploiting the lighting conditions he found in mid-Victorian Scotland. In a paper presented to the Photographic Society of Scotland in 1856, he said

> If you were to ask me to what circumstance more than another I attribute my success, I should say, not to any peculiarity whatever in my manipulation, or to any particular strength of the solutions I employ, but entirely to this, that I never expose my papers unless the light is first-rate. This I have now made a rule, and nothing ever induces me from it; and I may safely say that since I attended to this I have never had a failure. (Keith, "Dr. Keith's Paper on the Waxed Paper Process" in Photographic Notes vol. 1 no. 8, 17, July 1856, 101–104)

His family had several early associations with photography. As a founder member of the Free Church of Scotland, his father, the Reverend Alexander Keith, had been photographed by David Octavius Hill and Robert Adamson for inclusion in Hill's painting "The Signing of the Deed of Demission at Tanfield." Thomas's brother Alexander, also a clergyman, was also photographed by Hill and Adamson. His older brother George Skene Keith, an amateur daguerreotypist, travelled to the Holy Land in 1844 and 1845 and produced daguerreotype views from which engravings were made for the 1848 edition of his father's book *Evidence of the Truth of the Christian Religion*.

Keith's practical engagement with photography spanned no more than five years. His earliest dated images were taken in 1854, his last in 1856. As some unspecified examples of his salted paper prints were reportedly exhibited in Aberdeen in 1853, it can be assumed that he had first experimented with photography no later than the summer of 1852. He intimated his decision to give up photography in 1857, almost certainly due to increasing pressures on his time as a medical practitioner. There is no evidence that he took any photographs in that year. He did, however, continue to exhibit his work for several years after.

Keith's medium of choice was Gustave le Gray's Waxed Paper Process, a process ideally suited to the constraints placed on his photography by the demands of his profession.

For the practice of photography to be possible, he needed a process which permitted him to prepare his negative materials in advance, and process them some time after exposure. Despite the ascendancy of the Wet Collodion process, Waxed Paper was ideally suited to the time-constrained amateur. With it, Keith pre-waxed and prepared his paper negative materials at least a day in advance, and developed them overnight. Thus freed from collodion's requirements of location processing, Keith could operate with lightweight and easily transportable equipment, and respond quickly to lighting conditions. His reasons for selecting the Waxed Paper Process are all contained and clearly expressed within the text of his 1856 lecture.

That lecture, to the Photographic Society of Scotland on 10th June 1856, is one of the most significant explications of the Waxed Paper Process. In it he underlines the importance of the quality of the prevailing light—the feature which marks Keith's photography out as exceptional. Turning necessity to his advantage, he learned how to exploit the soft long shadows of early morning and late afternoon.

> I am almost always sure of clear mornings soon after sunrise, and most of my negatives have been taken before 7 in the morning or after 4 in the afternoon. The light then is much softer, the shadows are larger and the halftints in your pictures are more perfect, and the lights more agreeable. (Keith, "Dr. Keith's Paper on the Waxed Paper Process" in *Photographic Notes* vol. 1 no. 8, 17 July 1856, 101–104)

By the time of his invitation to deliver that key lecture, Keith's reputation as a photographer was already considerable. The images he displayed at the meeting were "greatly admired, and were considered by the Society to be the finest yet produced."

He was an early member of the Society, serving on its Council from 1856 until 1858, although he seldom attended meetings. He did, however, exhibit regularly, and images of Iona Abbey, taken in early September 1856, were hung in the Society's first Exhibition in 1857, to considerable acclaim. He exhibited in both 1858 and 1859, his last contribution being to an exhibition in Aberdeen where his work was shown alongside photographs by his friend John Forbes White with whom he had collaborated on several of his photographic expeditions.

Since their creation, Keith's photographs have had many admirers, including Alvin Langdon Coburn, who made prints from selected original negatives and exhibited them at the Royal Photographic Society in 1914, almost sixty years after they had been taken. Coburn included Keith as one of the "Old Masters of Photography," describing his work as being "as good as Hill's." He arranged for a selection of prints to be shown in New York's Ehrich Gallery, and again in Buffalo in the following year. He eventually acquired some of the negatives, later bequeathing them to George Eastman House. Miller and art collector, John Forbes White was also included as one of Coburn's "Old Masters."

Keith's reputation was further embedded by Helmut Gernsheim's inclusion of his work in the 1951 exhibition *Masterpieces of Victorian Photography* at the Victoria and Albert Museum in London.

The major holding of his work—predominantly Waxed Paper negatives—is the Hurd Bequest in Edinburgh Central Library.

JOHN HANNAVY

Biography

Thomas Keith was born in St. Cyrus, Aberdeenshire, Scotland, in May 1827, one of seven sons of the Reverend Alexander Keith. He studied art in Aberdeen, before becoming one of the last medical apprentices in Edinburgh, and subsequently serving as a junior member of Sir James Young Simpson's team working on anaesthetics—his brother George Skene Keith was Simpson's assistant. After qualification, and a residency at Edinburgh Infirmary, he moved to Turin as House Surgeon in the British Embassy, returning to Edinburgh in 1851. By the time he took up photography, he was in general practice with his brother George. He later pioneered several important procedures in ovarian surgery, and his hobby always took second place to his career as a doctor, surgeon and gynaecologist. His close and lasting friendship with Joseph Lister was sustained by a shared belief in the importance on cleanliness in the operating theatre, and he was one of the first to introduce Lister's antiseptic techniques in his work. In his obituary, celebrating an eminent career in medicine, the only reference to photography concerned his knowledge of glass—ironic for a master of the paper negative! He died in 1895 as a result of health problems exacerbated by sustained exposure to large quantities of early antiseptics.

See also: Waxed Paper Negative Processes.

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KERN, EDWARD MEYER (1823–863)

The youngest of three Philadelphia-born, artistically-minded brothers who all took part in important ventures of American exploration in the mid-19th century, Edward Meyer Kern was probably the boldest, and, although primarily a draughtsman, the only one to practice photography—in the form of daguerreotypes. Indeed, he used a daguerreotype apparatus on several important American naval expeditions to the Far East and thereby helped introduce the process in a number of locations in Asia and the Pacific area.

Though his actual photographic output was still largely unknown or unidentified, and though most holdings of his work consisted exclusively of sketches, drawings and maps of the American West, Edward "Ned" Kern was a significant figure in the development of photography, for at least two reasons. First, he was part of an important cultural and professional transition, which saw the novelty of photography gradually penetrate the tradition of scientific drawing in American exploration, albeit only timidly at first. Second, after 1853 Kern was a pioneer spreading photography to the Far East and, as such, a representative of the process of technological modernization, which in many parts of the world was associated with the advent of photography.

Kern's involvement in photography, however, had been slow in developing. As was the case with most of the artists, draughtsmen and scientists who took part in the ambitious U.S. government program of exploration of the American West before 1860, Kern did not at first seem interested in the daguerreotype process as an adjunct to scientific exploration. From 1845 to 1851, instead, he worked exclusively as a pencil artist and topographer on several surveys of the American West, notably under the leadership of John Charles Frémont, and often in company with his brothers Benjamin and Richard Kern, the latter being regarded as the most gifted artist of the trio.

Frémont, it is true, had experimented with the daguerreotype as early as 1842, and he did hire a daguerreotypist on his 1853 expedition, but this was rather an exception in the U.S.; at any rate, claims that Edward Kern was once employed as daguerreotypist by Frémont are not substantiated by survey records or private archives. Although his sketching style might be regarded as theatrical and almost naive, Kern was in fact a prime example of the American explorers' typically Romantic and highly productive commitment to the hand and the eye; along with the prolonged dominance of the impractical daguerreotype process, this explains why until 1860 photography remained largely alien to the practice of U.S. military engineers, who instead favored tried-and-true methods closely associating topography and draughtsmanship.

After breaking his connection to Frémont on account of the latter's brash methods, Kern indeed continued to work with brush and pencil on various Western surveys until 1851-52, reaching a degree of fame in Philadelphia with several exhibitions of Western sketches and illustrations of botany and Indian subjects. Without a doubt,

through his stays in California and his experiences in exploration, this skilled and adventurous artist-scientist must have learned about the daguerreotype before 1853. In 1853, however, when Kern did take up the process, it was not to go back once again to the American West with the Army's topographical surveys, to which he lost both his brothers between 1849 and 1853—killed by Indians—but to leave American soil and take to the sea.

That year Kern enrolled as artist and daguerreotypist on the U.S. Navy's North Pacific Expedition, and before sailing went to New York especially to gain instruction in the process at the Anthonys' firm. The North Pacific Expedition, which was to remain at sea until 1855, was a large-scale venture, intended to provide a scientific complement to the famous, more strategically-minded expedition of Commodore Matthew Perry, which had just forced the "opening" of Japan to the West and had itself included daguerreotypist Eliphalet Brown. The Ringgold-Rodgers expedition ended up covering a huge area in the South and North Pacific, exploring naval routes and describing coastal areas from Australia to China, along the Japanese coasts, and even north to Kamtchatka and Siberia; it was prolonged by another Navy survey of sea routes between California and China in 1857–1860, on which Kern was also engaged as artist and daguerreotypist.

Although few or none of the many images that he produced on these historic ventures have surfaced so far (one probable exception being a view of the American cemetery at the Gyokusen-Ji Temple in Shimoda, Japan, which is held at the George Eastman House and was exhibited in Tokyo in 1992), it is known from written sources that Kern made daguerreotypes, as well as sketches, on the coasts of China, Japan, Siberia, and on various islands such as Hawaii and Okinawa. Indeed, as historian of American exploration William H. Goetzmann has written, "perhaps even more than Brown of Perry's expedition, Kern introduced photography to the Far East" (*New Lands, New Men*, 350). In Japan especially, it appears that the introduction of photography by Brown, Kern and others heralded made visible, the advent of Western culture, its technology, its particular form of realism, and its commercialism, which were to be adopted quickly and efficiently.

It is certainly worth noting that whereas the U.S. Army's engineers refrained from resorting to a technology that they tended to view as ill-suited to their needs and even tainted with a kind of charlatanism, the U.S. Navy made a point of displaying and exporting this same technology—along with telegraphy, clocks, and railroads—to the potential markets and dominions of the Pacific, as if the daguerreotype had most concretely embodied the supposed superiority of Western culture. In this early episode of globalization, Edward Kern was merely an agent, but in hindsight he appears as a prime illustration of the fundamental link between American expansion, technological modernity, and the appeal of the sun-picture.

François Brunet

Biography

Edward Meyer Kern was born in Philadelphia in 1823, the youngest of a genteel family that also produced an art teacher and two other artist-explorers, Benjamin Jordan (1818–1849) and Richard Hovenden (1821–1853). Having exhibited in Philadelphia as early as 1841, "Ned" Kern participated in several surveys of the American West: in 1845 with John Charles Frémont's third expedition and his "conquest of California"; in 1848, again with Frémont, through the central Rocky Mountains, this time along with Benjamin and Richard (Ben was eventually killed on this expedition); in 1849 on a military raid against the Navajos, and in 1850-1851 for topographical work in New Mexico. From 1853 to 1855 Edward joined, as artist-daguerreotypist, Lieutenant Cadwalader Ringgold's North Pacific Expedition, later commanded by Lieutenant John Rodgers; from 1857 to 1860, he was daguerreotypist to Lieutenant John M. Brooke's survey of sea routes in the Central Pacific. Once back in the U.S., and after another stint with Frémont, Edward Kern returned to Philadelphia and taught art. He died of epilepsy in 1863.

See also: Brown Jr., Eliphalet.

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KERRY, CHARLES (1857–1928)

Australian photographer and studio owner

Charles Henry Kerry was born on Bobundra Station, near Bombala, NSW in 1857, the son of grazier Samuel

Kerry and Margaret Blay. As a teenager he accompanied a travelling photographer, then at 17 he worked for Alexander H. Lamartiniere in a studio at 308 George St, Sydney, eventually becoming a partner in the business. Lamartiniere left the business in debt around 1883 but Kerry managed to resurrect it, providing portraiture which he eventually delegated to staff while he photographed an increasing array of landscape views, social events and bush life. In the 1886 he formed a partnership with C. D. Jones that capitalised on the dry plate process. In 1888 Kerry began using magnesium flashlight, put to use inside the Jenolan Caves and 10 years later he used electric flashlight. Kerry and his employed photographers made regular trips throughout New South Wales during the 1890s executing private and government commissions and building a massive stock of landscape views. In 1895 the NSW Government requested Kerry photograph the state's Aborigines. In 1898 new four level premises were opened at 310 George St. In 1903 the firm started producing postcards and it quickly became one of Australia's larger postcard publishers. Kerry left the business in the hands of his nephew in 1913 to pursue mining interests and it closed in 1917. Kerry died in 1928 in North Sydney.

MARCEL SAFIER

Holdings: State Library of New South Wales, Sydney; Powerhouse Museum, Sydney; State Library of Victoria, Melbourne; National Library of Australia, Canberra.

KILBURN, BENJAMIN WEST (1827–1909) AND EDWARD (1830–1884)

Stereoscopic photographers and publishers

Benjamin and Edward Kilburn were the sons of Josiah and Emily Bonney Kilburn. Josiah managed a machine and iron foundry in Littleton, New Hampshire. Benjamin, the oldest child, was born on 10 December 1827. His brother Edward was born on 27 February 1830. In 1843 both children began a three-year apprenticeship at an iron foundry in Fall River, Massachusetts. After their apprenticeship they returned to Littleton to work with their father.

Littleton is located in northern New Hampshire, on the western edge of the White Mountains. Its popularity as a tourist destination dates to the middle of the nineteenth century. The area offered spectacular scenery and hiking, fishing, and hunting opportunities, as well as resort hotels for relaxing and dining.

In the mid-1850s Edward Kilburn learned photography from O.C. Bolton, one of the early White Mountain photographers. Edward pursued photography as a pastime while he established a match factory and later sold Grover and Baker sewing machines. Both brothers enlisted in the Civil War. In 1865 they formed a stereographic view partnership, known as the Kilburn Brothers, which would grow to dominate the field of stereo publishing. Stereo views are two photographs mounted side-by-side that appear three-dimensional when placed in a viewer called a stereoscope. Collecting stereo views was a craze of the middle-class in the mid to late nineteenth century. People acquired stereo views of tourist spots that they had visited as well as exotic locales that they would only experience through the wonder of the stereoscope.

Although Edward was initially the firm's primary photographer, Benjamin quickly took over this important duty. Early views concentrated on the White and Franconia Mountains. In spite of their rural location, Kilburn Brothers's views were sold around the country. In 1866 the *Littleton Gazette* reported that: "... the Kilburn Brothers with their new instrument for taking Sterreoscopic [sic] views ... are being extensively circulated throughout the United States, and are pronounced by the most useful critics to be equal if not superior to any others published in the United States."

After only two years of business the firm was selling views internationally. In 1867 the Kilburn Brothers built a factory on Main Street in Littleton. In addition to the production areas, a sales shop occupied the front room.

The Kilburn Brothers used assembly line techniques in the production of their stereo views. The firm employed predominantly women who were responsible for a variety of duties including sensitizing the albumen paper, and hand cutting and pasting the prints. Men worked as printers, photographers, and in managerial positions. Over the years, the number of employees fluctuated, reaching a peak in 1904 when the company employed more than 100 people. They worked ten hour days from 7 a.m. to 5 p.m.

In December 1873 the Kilburn Brothers moved into a new and bigger factory on Cottage Street in Littleton. This building had a southern exposure along its length, providing more natural light for the printing operation. At this time, the company produced between 1400 and 1800 stereo views a day. A dozen views cost approximately $2.00.

Despite the company's success, Edward retired in February 1875 at the age of forty-five. In retirement he gave a series of magic lantern shows featuring views from the Kilburn Brothers's inventory and planted a large orchard. He died in 1884.

Benjamin continued to run the stereo company, changing its name to the B.W. Kilburn Company. One of the company's specialties was views of the cog railroad run by the Mount Washington Steam Railway Company. Kilburn documented the development of the railroad, and a series of his views appeared in the

21 August 1869 issue of *Harper's Weekly.* By tilting the camera, many of his stereo views exaggerate steep angle of the track making the descent look vertiginous. With other views, Kilburn carefully composed his photographs, often emphasizing the foreground to enhance the three-dimensional qualities of the stereo views. In addition to his views of New England, Benjamin made stereo views in Virginia, Bermuda, Mexico, Canada, and Europe. He photographed events, such as Grover Cleveland's inauguration, and acquired the exclusive rights to produce stereo views of the 1893 World's Columbian Exposition in Chicago and the California Midwinter Exposition. Other popular subjects sold by the firm were the Johnstown, Pennsylvania flood, the Boxer Rebellion, the Boer War, and the Spanish-American War.

One of the company's foremost photographers was Percival Graham. He joined the firm in the 1870s and photographed extensively at the 1901 Pan American Exposition held in Buffalo, New York. James M. Davis also worked as a photographer and distributor for the company.

The firm used several cameras including a Henry Clay stereo view camera and an American Optical Company camera that used a tripod. In an effort to eliminate the use of a tripod, Benjamin designed a "gun camera." The camera was mounted on a gun stock that rested on the photographer's shoulder.

In addition to their own inventory of negatives, Kilburn also bought negatives from other photographers. In 1881 he purchased the negatives and rights to a large collection by Boston stereo manufacturer John Soule, which included views of Niagara and Yosemite.

The studio produced both standard sized stereo views and larger cabinet sized stereos. Most views were pasted to buff mounts. Yellow, orange, and gray mounts were also used. Their stereo views were available for purchase in the company's sales room, and at local stores, hotels, and tourist sites, such as the Mount Washington Railway gift shop. College students were employed in the summer to sell stereo views door-to-door in the Northeastern and Midwestern United States. In the 1870s the company issued catalogs listing their views. Orders could also be placed by mail.

In the United States, the Kilburn firm was both the largest producer of stereo views and in operation for the longest period of time-forty-four years. The exact date of Benjamin Kilburn's retirement is unknown. In 1901 he sustained a stroke which left him disabled until his death in 1909. In 1910 the Kilburn negatives and equipment were sold to their former agent James Davis, and later to one of their main competitors, the Keystone View Company.

Kilburn's negatives and logbooks are in the collection of the California Museum of Photography. The Littleton New Hampshire Public Library holds thousands of Kilburn stereo views.

CAROL JOHNSON

Biography

Benjamin Kilburn (1827–1909) married Caroline Burnham on 16 November 1853. They had one daughter named Elizabeth. On 25 May 1857 Edward Kilburn (1830–1884) married Adaline Owen, a local schoolteacher. Their union produced one child, a daughter named Emily. In 1862 both brothers enlisted in the Civil War, and served through 1864 in New Hampshire's 13th Regiment, Company D. In 1865 the Kilburn Brothers stereo company began operation. It became the most prominent stereo view company in the world. Their views were exhibited at the 1876 Philadelphia Centennial exhibition. In 1909 when the company ceased operations their inventory included nearly 100,000 glass stereo negatives.

See also: Stereoscopy.

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KILBURN, WILLIAM EDWARD (1818–1891), AND DOUGLAS THOMAS (c. 1812–1871)

English photographers

The brothers Douglas and William Kilburn were born in London, the sons of Thomas Kilburn and Catherine Ward.

William Kilburn was working as a professional photographer before. 1846 and his photographs of a Chartist Rally in London in 1848 brought his work to the attention of Prince Albert, from whom he later received several commissions, styling himself 'Photographist to Her Majesty and His Royal Highness Prince Albert'.

Kilburn exhibited a series of 'photographic miniatures (daguerreotypes) at the 1851 Great Exhibition, but finest daguerreotypes were produced between 1852 and 1855, at his studio at 234 Regent Street London. His use of light, and skilful tinting was remarkable. From 1856 he exclusively used collodion.

Douglas Kilburn, a watercolorist and photographer, emigrated to Australia before 1847. After having arranged for William to send equipment and materials from England, he was the first to make daguerreotypes of Aboriginal people of the Yarra Yarra tribe in Victoria in 1847 which were used as basis of illustrations in William Westgarth's *Australia Felix* (Edinburgh 1848). He operated a daguerreotype studio in Collins Lane, Melbourne, from May 1848—only the second professional photographic establishment in the city.

He returned briefly to Britain in 1850 where he was married, before returning to Australia and settling in Hobart, Tasmania—where he was the first to demonstrate stereoscopic photography in 1853. He eventually turned his attention to politics and became an MP in the Tasmanian parliament.

JOHN HANNAVY

KIMBEI, KUSAKABE; See KUSAKABE KIMBEI

KINDER, JOHN (1818–1903)
English artist and photographer

The Rev. John Kinder (1818–1903) was ordained in the Anglican Church after attending Cambridge University. He came to Auckland, in 1855 where he took up a teaching post at the Church of England Grammar School. In the tradition of well educated English gentlemen, he made several sketching tours in the North Island during term breaks. Around 1860, after taking lessons in photography from an Auckland professional photography Hartley Webster, he completed a series of stereoscopic views which of Auckland. As he grew in confidence as a photographer, he took to using a large format view camera which yielded a series of topographical views. About this time, his photography became something of an *aide memoir* for his watercolours. He was a brilliant draftsman and was well aware of all the effects that could be obtained by perceptive selection of subject and rendering. His intense commitment to photography ended in 1872 as other matters demanded his attention. Kinder obviously considered photography as being on an equal footing with his watercolours, exhibiting them as he did along with his watercolours at exhibitions staged by the Auckland Arts Society.

WILLIAM MAIN

KING, HENRY (1855–1923)
Austrailian photographer

Henry King was born in 1855 in Swanage, Dorset, the son of William and Eliza King. He arrived in Sydney, Australia as a toddler aboard the *Kate* in 1856. He started in photography in 1873 working for the studio of J. Hubert Newman. King opened a studio at 330 George St., Sydney, in partnership with William Joseph Slade in 1879. They moved to 316 George St the following year then Slade left to set up in Newcastle. King worked by himself thereafter initially producing *carte de visite* portraits, but with time he began to specialise in landscapes, rivalling the work of Charles Kerry. King travelled extensively in New South Wales and Queensland to photograph landscapes and to document the Aboriginal population. In addition to enlargements, King produced many lantern slides and stereoviews including series featuring the Jenolan Caves and views around Sydney and environs. King was active in the NSW Photographic Society and always encouraged amateurs. He worked from a variety of George St addresses until 1920 and died following an operation 23 May 1923. In 1929 bookseller James Tyrrell acquired several thousand of King's glass plate negatives that are now in the Powerhouse Museum, Sydney.

MARCEL SAFIER

Holdings: State Library of New South Wales, Sydney; Powerhouse Museum, Sydney; Macleay Museum, University of Sydney, Sydney; State Library of Victoria, Melbourne; National Library of Australia, Canberra.

KING, HORATIO NELSON (1828–1905)
English photographer

The career of H. N. King spans the first sixty years of photographic history and also encompasses a wide range of formats and subjects. Starting in Bath in the 1850s he ingeniously combined the roles of local theatrical impresario with taking portraits of celebrities visiting this fashionable resort.

Moving to London he inherited more than 1000 negatives taken by the photographer Vernon Heath and by the late 1870s he had transferred his scope and operations to the Goldhawk Road in West London becoming an important topographical and architectural specialist competing with Francis Frith, James Valentine, and George Washington Wilson. This business was underpinned by his longstanding connections with the Royal family: in his reminiscences he mentions visiting Windsor Castle over 250 times to create what must be one of the most extensive records of royal residence including Buckingham Palace, St. James' Palace and other properties.

King claimed to have been the first to introduce photographs in railway carriages having been granted two first class tickets for six months by the Great Western Railway. This must link with his catalogue of over 7000

mainly British views including stereo cards and lantern slides—which also includes over 150 views of India.

IAN LEITH

KINNEAR, CHARLES GEORGE HOOD (1832–1894)

Schottish photographer and inventor

The Honourable C. G. H. Kinnear was active in photographic circles, particularly in Scotland, from the mid-1850s until the early-1890s and was described as 'the inventor of the modern form of camera bellows'.

Kinnear was a founding member of the Photographic Society of Scotland from 1856 until it was wound up in 1873 and held various offices with the Society including Honorary Secretary from 1856–1860 and Vice President. He was also a founder member of the Edinburgh Photographic Exchange Club from 1859 and, later, a member of the Edinburgh Photographic Society. He exhibited widely in Scotland. He published several articles in the photographic press including reports of his photographic travels and exhibited his work between 1856–1864.

His principal contribution was a design of camera which he described in 1857. A report was published in the *Journal of the Photographic Society* in February 1858. Kinnear's camera had tapered bellows which allowed each fold to collapse within the previous larger fold when closed. The design was based on Captain Fowkes' camera which had straight bellows, but Kinnear claimed his design was stronger and more suited to travelling. It also cost about £4 or half the price of the Fowkes camera which it quickly superseded. The original camera was for 12½ × 10½ inch paper negatives and was built for Kinnear by Bell of Potterrow, Edinburgh. The camera was 15½ × 13 × 3½ inches when closed and weighed 13lbs. The design was taken up by the principal London camera makers such as Ottewill, Bland & Co, Rouch and Meagher and Improved Kinnear cameras were advertised from the early 1860s.

Kinnear's original design was a little awkward with the back section needing to be screwed on to the baseboard and the lens board required mounting on to the front standard. Camera makers improved and adapted the basic design while keeping the innovative bellows arrangement. Over time the means of focusing was changed from an endless rod screw from the camera's back to a side-turned rack and pinion and refinements such as swing-backs, rising fronts and reversible and fixed backs were added. The refined design, principally through the work of McKellen in the 1880s, became the *de facto* standard plate camera until the early twentieth century. Kinnear died aged 63 on 5 November 1894.

MICHAEL PRITCHARD

KINSEY, DARIUS REYNOLD (1869–1945)

American photographer

Darius Reynold Kinsey was born on July 23, 1869, in Maryville, Missouri. In 1889 he and his family moved to Snoqualmie, Washington Territory. After learning photography from a Mrs. Spalding in Seattle around 1890, Darius spent five years photographing for the Seattle and Lake Shore Railroad Company. He formed a brief partnership with his brother Clark, but Clark and another brother Clarence moved to the Yukon Territory, Canada, during the Klondike Gold Rush, forming the Kinsey & Kinsey photography business in Grand Forks. Married in 1896, Darius' wife Tabitha (d. 1963) worked in the darkroom. Their first studio, opened in 1897, was in Sedro-Woolley, Washington. In 1906 they relocated to Seattle and Darius gave up portrait work, devoting himself over the next three decades to photographing logging activities in the Pacific Northwest, a passion shared by his brother and competitor Clark between 1913 and 1945. Darius worked with stereoscopic, panoramic, and large format cameras, including a 20 × 24 inch camera. Only an injury at age 71 stopped his career. The Whatcom Museum of History and Art, Bellingham, Washington, acquired the Darius Kinsey collection (over 4,700 negatives and several hundred prints) in January 1979. The University of Washington also holds 151 Darius Kinsey prints, along with his brother Clark's negative collection.

DAVID MATTISON

KIRCHNER, JOHANNA FREDERIKA DORIS (EMMA) (1830–1909)

European photographer and studio owner

Emma Kirchner was one of the few female European photographers of the 19th century. A portrait made around 1855 by the first female daguerreotypist of Germany, Bertha Wehnert-Beckmann (Leipzig 1815–1901), discovered in 2004, showed a young Emma Kirchner. It only proved that they knew each other, but doesn't prove that Kirchner was her pupil. The proof that Kirchner already worked as a photographer in Leipzig, was shown at the back of her oldest picture made after her arrival in Holland which marks "*Emma Kirchner—Zuiderstraat*."

After the death of her father, Emma's mother took care of the tailor shop he left her and Emma, not yet three years old and baby Maria. Mother and daughter Emma ran the shop with very little help.

Kirchner never married but had daughter Dorice with the Leipzig Publisher Rudolph Loës and two daughters (one of whom died after a few days) with Commissionaire Carl August Bretschneider.

Kirchner immigrated 1863 to Delft in the Netherlands with her mother and daughter Dorice. Kirchner started the photographic firm with Frederik Gräfe, husband of her sister Marie, and from there photos where signed "*E. Kirchner & Co-Zuiderstraat 179*." At the firm, Emma Kirchner was the professional photographer and Gräfe still a gunsmith until 1872.

May 9, 1871, Gräfe fired Kirchner and announced that he would work alone at number 136 at the same street, on May19, Kirchner announced that she worked alone in the old studio.

In 1875 her daughter Dorice (1852–1939) married Henri de Louw (1851–1944) with whom Kirchner worked almost a year as '*Henri de Louw & Emma Kirchner.*'

Unfortunaly Kirchner never left any written documents, which makes her life more mysterious.

From 1876 until 1899 Kirchner made her best work, mostly *carte-de-visite* and *cabinet pictures* portraits of Citizens in and around Delft by albumin-style. May 1899 Johan van Doorne took over her studio.

Kirchner moved to The Hague and in 1903 to Amsterdam where she died at the house of composer Bernard Zweers (1854–1924), who was married to her granddaughter Dora (1876–1959).

Kirchner was not only a highly educated emancipated woman, but the only women photographer in Delft until almost the end of the 20th century. She was the only photographer in the Netherlands to work alone for such a long period of time without any pupils, compared to other female photographers, who worked with their husbands or pupils.

PETRA NOTENBOOM

KLIČ, KAREL VÁCLAV (1841–1926)

Perhaps surprisingly, for someone whose contribution to the printed image was so significant, some considerable confusion results from reading the published accounts of Klič's life. He is variously described as being Czech, German and Austrian.

Karel Václav Klič was born in Hostinne, in the foothills of the Krkonose Mountains in the present-day Czech Republic. The town has long been a centre for paper-making. His artistic talents showed early in his life, and he was admitted as a student at the Art Academy in Prague in 1855 when aged only 14. Apparently unwilling to conform, he was expelled after only a few months, only returning to complete his studies some years later.

Klič, also known as Karl Wenzel Klietsch—the German/Austrian version of his name—had a varied career —working as a draughtsman and as a painter for a time, before leaving Prague. He was also an accomplished cartoonist and illustrator, and found outlets for his work in many newspapers. Records show that he worked in Prague and Brno (Moravia) and Budapest before opening a photographic studio in Vienna, Austria.

It was probably Klič's experience in newspaper illustration which led him to revisit the idea of developing a photo-mechanical printing process—an idea first explored and brought to fruition, albeit crudely, by Henry Fox Talbot in the 1850s.

It was while he was working in Vienna that Karl Klič developed the process for which he is remembered —photogravure. His first successful prints were exhibited at the annual exhibition of the Vienna Photographic Society in October 1879 and drew much admiration, although the secretive Klič did not reveal any details of his methodology. Further prints were exhibited at the following year's exhibition in November 1880. With hindsight, much of the credit for the process must go to Talbot whose photoglyphic engraving process had produced a similar if rather less refined result more than twenty years earlier, but Klič's innovations made it work much more effectively. Whereas Talbot's work had largely remained experimental, Klič's process became the first widely used mass-production process for photographic images, offering the permanence of a pigment-based image at a cost which was only a fraction, in both time and money, of that associated with the Woodburytype or with carbon printing.

In 1880 and 1881, several of his prints were reproduced in the Austrian photographic journal *Photographische Korrespondenz*, and also in 1881, a photogravure portrait of Mungo Ponton was published in Britain in *The Yearbook of Photography and Photographic News Almanac.* This portrait, provisionally dated 1870-1879 may have been taken by Klič.

The process was used to great artistic effect by, amongst others, Peter Henry Emerson in the 1880s for publications such as *Pictures of East Anglian Life*, published in 1888.

Alfred Steiglitz started to use the process in the 1880s, ands some of the finest examples of photogravure printing can be found on the pages of *Camera Work* published by Steiglitz in the early years of the twetieth century.

T & R Annan of Glasgow, whose *Old Closes and Streets* had originally been produced in carbon two decades earlier, produced editions in photogravure in 1900. Thomas Annan and his son James Craig Annan had learned the intricacies of gravure printing directly from Klič in Vienna in 1883.

Klič had experimented with zinc etching processes in the 1870s before his quest for the ideal photomechanical printing process led him to what became photogravure. His earliest proposals embraced ideas drawn both from Talbot's experimental process of 1858, and from the carbon printing process, at the height of its popularity in the 1870s.

A copper plate was coated with a resin and then a bichromated gelatin tissue similar to that used in carbon printing. After exposure, the unhardened bichromated gelatin could be removed and the plate etched. The etched plate was then inked—the ink being held within the etched areas to depths dependant upon the tonal density of the image—and printed on a flatbed printing press. No 'screen' was necessary, and the process was capable of rendering a considerable tonal range. This process is now known as 'grain gravure' to distinguish it from the later screen-based process.

But Klič's vision extended well beyond the production of single sheet-fed prints, and in 1895 he and his collaborator Samuel Fawcett developed rotogravure. It would appear that Klič and Fawcett had been working, independently, towards the development of a rotary intaglio printing process, and that their collaboration brought the process to a successful conclusion. Klič was, by the early 1890s, resident in England.

At some point c.1890 Klič made contact with the Storey Brothers in Lancaster, a firm of calico printers where, according to company records, Fawcett was already employed. By 1895 Klič, Fawcett and the Storeys had established the Rembrandt Intaglio Printing Company to exploit the new rotogravure process. Fawcett had been working on a design for a rotary press for textile printing, and Klič's rotary photogravure expertise proved the catalyst. It was at Klič's suggestion that the company moved from printing textiles to printing high quality gravures of paper. Their *Burlington Art Miniatures* were a significant commercial success, and for several years they led the world in high quality gravure printing, still closely guarding the details of their techniques. Eventually, of course, other companies caught up with them, and instigated technical improvements to the process.

By 1897 Klič was technical director of the company, but in that year he left England and returned to Vienna, leaving the operation of the Rembrandt Intaglio Printing Company to Fawcett. He returned briefly in 1906—by which time he had perfected a close-registered three-colour gravure process using a fine half-tone screen—but he spent much of the remainder of his life in Vienna where he died on November 16th 1926.

JOHN HANNAVY

See also: Talbot, William Henry Fox; Annan, Thomas; Stieglitz, Alfred; Emerson, Peter Henry; and Photogravure.

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KLUMB, REVERT HENRY (1837–c. 1886)

Born in Berlin, Germany in 1837, Revert Henry (Henrique) Klumb began working in Brazil in the early 1850s. After running the studio of French photographer and lithographer Paul Theodore Robin, he worked for a painter, François René Moreaux. In 1855, he opened his own studio and pioneered stereoscopy in Rio de Janeiro. Emperor Pedro II appointed him Imperial Photographer on August 24, 1861. Around that time, Klumb opened a studio in Petrópolis, the emperor's mountain retreat. After moving there in 1865, he lectured at the Imperial Academy of Fine Arts and tutored Princess Isabel, the Emperor's daughter. In 1872, he published an illustrated road guide on Brazil's first highway, between Petrópolis and Juiz de Fora, Minas Gerais. Renowned for his landscapes and bold use of close-ups when photographing plants in Princess Isabel's gardens, he exhibited his works at the Petrópolis Horticultural Exposition in 1875. After that, Klumb and his wife, Hermelinda Barreto, went to live in Bahia and had two daughters there. By 1886, they were in Paris, from where he wrote to Empress Teresa Christina begging her to help him and his family return home. His patroness agreed, but he died shortly thereafter, possibly en route to Brazil.

SABRINA GLEDHILL

KNUDSEN, KNUD (1832–1915)

Norwegian landscape photographer

Knud Knudsen was born in Odda, Norway. He came from a family of country merchants, but got interested in photography quite early. He probably worked as an assistant to Marcus Selmer from 1857, before he started his own studio in Bergen in 1864. His business grew to one of the biggest in the country, catering to Norwegians and tourists alike and selling thousands of images.

His motives are mainly landscapes and documentation of the rapidly vanishing rural culture from which he came. Knudsen was the first to systematically photograph the whole of Norway, but with emphasis on the Vest coast. In spite of some composition elements inspired from painting, his images show us a skilled photographer who uses photographic elements to the full. Up to 1882 Knudsen used the wet plate and his darkroom tent is sometimes to be seen in his images. He developed an understanding for the special quality of the collodion process and produced images that are full of contrast and detail in the dark parts. To solve the difficult problem with exposure time for light and dark surfaces

Knudsen often made two exposures. One can therefore find different landscapes with the same sky. Knudsen retired in 1898 and left his business to a relative.

The University of Bergen possesses the biggest collection of images, both negatives and positives, after him.

Hanne Holm-Johnsen

KOCH, ROBERT (1843–1910)

Heinrich Hermann Robert Koch was born on December 11, 1843, in Clausthal, a small mining city in the Harz Mountains of Lower Saxony (Niedersachsen). Robert's father, Herrmann Koch, was a mining administrator who eventually became head of the mine. Robert's mother, Mathilde Biewend, was actually her husband's grandniece. Koch died on 27 May 1910 at Baden–Baden, a victim of a serious heart attack.

From positions as a country doctor, experimenting on microbes in his spare time, he moved to Berlin and eventually went on to become—together with his great French rival Louis Pasteur—the founder of bacteriology.

His articles about bacteriological methods—including culture media, microscopic plate technique, and specimen staining procedures—held great significance for the history of photomicrography.

In 1877 Koch published the first photomicrographs of bacteria ever, producing collotypes of such quality, they set the standard for decades.

To produce the wet collodion negatives K. used state-of-the-art equipment such as the first focus free oil-immersion lenses and the new Abbe condensor, named after its inventor Ernst Abbe, an optical consultant for the Carl Zeiss Company in Jena.

For Koch himself photography was of eminent importance for scientific practice, especially in the field of microbiology, because "(t)he photosensitive plate represents the microscopic image more reliably than the retina of the eye" (Koch 1877, 408). "The photographic picture might be more relevant occasionally than the specimen under the microscope itself" (Koch 1881, 11).

Koch also made extensive use of photography during his several excursions, mainly to Africa, to study tropical medicine between 1883 and 1907. As well as serving as private souvenirs the photographs were made as medical documents, anthropological illustrations, or visual tools in "parasitological" research.

Jan Altmann

KODAK

In 1888, reviewing a new camera that had just come on the market, made by an American company formed just a few years earlier, *The British Journal of Photography* wrote: 'What, in the name of all that is photographic, is the Kodak…? Just over twenty years later, Bernard E. Jones in his *Cyclopaedia of Photography*, published in 1911 knew precisely what "Kodak" was: "A trade name which is so familiar that many suppose it to apply to all hand cameras..." This rapid transformation from unknown novelty to household word is one of the most remarkable episodes not only in the evolution of photography but in modern business history. The success of Kodak was down to the vision, industry, commercial awareness and determination of one man—George Eastman.

George Eastman (1854–1932) was born in Waterville, New York. From a modest family background—his father died when George was eight—he soon learnt the value of industry and thrift. Aged fourteen, he left school to work as an errand boy for a local insurance company, earning three dollars a week. Some idea of his character can be gleaned from the fact that, even as a teenager, he kept meticulous account books, noting every item of income and expenditure. By 1872 he had managed to save over $1,000. In 1874 he joined the Rochester Savings Bank as a bookkeeper. Still only twenty, he now took over all his family's financial responsibilities.

Despite his work and family commitments, young George still found time to pursue leisure interests, in particular, photography. In 1877 his account book reveals that he bought a photographic outfit for $49 and began to take lessons in wet collodion photography with a local photographer, George Monroe. He soon became absorbed in his new hobby, spending all his free time taking photographs or studying photographic magazines to improve his technique and knowledge. In 1878, he came across an article in *The British Journal of Photography* describing Charles Bennett's improved method for making gelatine emulsions by 'ripening' them to greatly improve their sensitivity. Eastman began to experiment with coating his own plates at home, often working through the night. By the end of the year, he was getting consistently successful results and began to consider making plates for sale. In 1879, frustrated by the tedious and slow process of coating plates individually by hand, he devised a plate-coating machine, consisting of a roller and a trough of warmed emulsion, which he patented in England, America and several European countries.

In 1880, just three years after he had first taken up photography, Eastman rented the third floor of a building in Rochester, New York and began the commercial manufacture of dry plates. He invested all his own savings in the enterprise but he also got financial backing from Colonel Henry A. Strong, a well-off whip manufacturer, who, with his wife, lodged with the Eastmans. Strong invested $1,000 and, crucially, gave George the benefit of his long business experience. On 1 January, 1881, the Eastman Dry Plate Company was formed, supplying plates to the leading American photographic

supply house, E. & H.T. Anthony. Later that year, Eastman resigned from his job in the bank and devoted himself full-time to his new enterprise. After surviving some early setbacks, the business prospered.

In 1883, the Company moved to larger premises in State Street, Rochester and the following year the business became a corporation, changing its name to the Eastman Dry Plate and Film Company. The change of name reflected the development of a new product, Eastman Negative Paper, which Eastman had devised in partnership with a camera maker, William H. Walker. Using paper as a negative support revived an idea from the earliest days of photography. Gelatine emulsion coated paper, however, was much more sensitive than earlier paper processes and offered a potentially attractive alternative to heavy and fragile glass plates. At first, special adapters enabled sheets of Eastman Negative Paper to be used in conventional plate holders. However, to fully exploit the possibilities of his negative paper, Eastman and Walker also devised a rollholder which attached to the back of a standard plate camera and contained a roll of negative paper sufficient for twenty four exposures. The paper was advanced after each exposure by turning a key. Rollholders were not a new idea. In 1854, Spencer and Melhuish took out a British patent for a device in which sheets of negative paper were gummed together and wound on rollers and in 1875 Leon Warnecke introduced a more sophisticated version which held a one hundred exposure roll of tissue coated with a dry collodion emulsion. These early rollholders, however, were not commercially successful—mainly because of imperfections of the sensitised paper. The Eastman Walker rollholder combined precision of manufacture with negative paper that was both sensitive and easy to manipulate and enjoyed some popularity.

Soon after the rollholder came on the market in 1885, Eastman announced an improvement on his paper negative film, which he called "American Film." This consisted of a paper base coated with a layer of soluble gelatine, then a layer of collodion and, finally, a gelatine emulsion. After exposure and processing, the film could be soaked in warm water, dissolving the soluble gelatine so that the image-bearing layer could be stripped off and laid on glass for printing. American, or "stripping" film as it was also known, combined the lightness and flexibility of paper with the transparency of glass but it was a comparatively difficult material to use.

To sell his range of plates, rollholders and negative papers, Eastman looked beyond North America to the lucrative European market. In May, 1885 an International Inventions Exhibition was held in London's Albert Hall. William Walker brought over some rollholders and exhibited them under the title "Apparatus for the production of negatives in the photographic camera from continuous rolls of paper." They won a silver medal form the exhibition judges and received favourable reviews in the British photographic press. Encouraged by this success, Walker returned to London later that year to open the company's first foreign office, at 13 Soho Square. European sales were promoted by the appointment of "sole agents"—one of the best-known being Paul Nadar, son of the famous French photographer, "Nadar."

Eastman's next move was to combine the concept of the rollholder and paper negative film with a hand-held or "detective" camera. In 1886 he took out a joint patent with Franklin M. Cossitt for a box-form hand camera designed to be used with either a rollholder or conventional plates. Despite the manufacturing experience gained from production of rollholders, manufacturing a camera proved to be both difficult and costly. By June 1887, only fifty had been completed. Eastman decided to cut his losses and sold them off to a Philadelphia photographic dealer, W. H. Walmsey, for $50 each. Only one example is known to have survived, and is in the Smithsonian Institution in Washington.

Undeterred, Eastman immediately began work another camera, putting into practice the lessons he had learned and devising a camera in which for the first time, the rollholder was an integral part of the design. This time he got it right. In October 1887, he wrote: "I believe I have got the little rollholder breast camera perfected." The "rollholder breast camera" was put on the market in June 1888 under a more succinct and memorable name—"The Kodak." In 1920, Eastman described how he had come up with the name:

> The letter "K" had been a favourite with me—it seems a strong, incisive sort of letter. It became a question of trying out a great number of combinations of letters that made words starting and ending with 'K.' The word 'Kodak' is the result. To the British Patent Office he wrote: 'This is not a foreign name or word; it was constructed by me to serve a definite purpose. It has the following merits as a trade-mark word: First, it is short. Second, it is not capable of mispronunciation. Third, it does not resemble anything in the art and cannot be associated with anything else in the art.

The Kodak camera initiated a revolution in photography that was to quickly transform it into a truly democratic pastime within the range of everyone, regardless of income or technical knowledge. Extremely simple to use, it reduced taking a photograph to three simple actions: 1. Pull the string. 2. Turn the key. 3. Press the button. The camera itself did not embody any great technical advances; it was not even the first camera designed solely to take roll-film. The most revolutionary aspect wasn't in fact the camera, but Eastman's concept of separating the act of picture-*taking* from that of picture-*making*. The Kodak was sold already loaded with film for 100 exposures. After this had been exposed, the entire camera was returned to the factory for the film

to be unloaded, developed and printed. The reloaded camera was then returned to its owner, together with a set of prints. The Kodak system was summed up by Eastman's famous advertising slogan—"You Press the Button, We do the Rest." For the first time, anyone (as long as they could afford the 5 guineas which the Kodak cost) could become a photographer.

Originally, "Kodak" was used only as a name for Eastman's detective camera; only later did it become generally adopted as a designation for the company's products. The success of the Kodak can be gauged from the fact that in May 1892, the company formally changed its American name to the Eastman Kodak Company. In Britain, the Eastman Photographic Materials Company had been set up in 1889 to manufacture and sell Eastman's products outside North and South America. From 1891, at their new factory in Harrow, they manufactured film and paper and developed and printed customers films. In 1898, reflecting the change which had already taken place in America, the British company changed its name to Kodak Limited. By this date, other European companies had been established, wholly owned by the British Company— Kodak Gmbh in Germany in 1896, Eastman Kodak S.A.F. in France in 1897. Belgium, Holland and Austria/Hungary followed in 1899, then Russia and Australia in 1900 and Italy in 1901. By the outbreak of the First World War, Kodak had offices and branches all over the world.

The introduction of a range of Kodak cameras, the successful manufacture of flexible celluloid rollfilm and, later, daylight loading film cartridges, transformed the company's fortunes. What had been a comparatively successful photographic manufacturer now became a worldwide business phenomenon. By the mid-1890s, over one hundred thousand Kodak cameras had been sold and the pace of growth showed no signs of slowing down. The word Kodak entered popular usage as a verb as well as a noun as people carrying Kodaks "Kodaked" everything in sight. As early as 1890, *Photography* magazine had correctly prophesied: "The word will very likely develop verbal, adjectival and adverbial forms as "'I am going to Kodak,' 'This is a Kodak negative,' 'This picture looks Kodakky'." Other manufacturers, too, were eager to seize on the popularity of the Kodak name but Eastman jealously guarded the integrity of his trade name and the company stamped down hard on any perceived misuse. In 1898, for example, the company obtained an injunction against the Kodak Cycle Co Ltd., preventing them from using the name Kodak in connection with any of their products. Similar court cases took place all over the world. As the company's advertisements repeatedly reminded customers: "If it isn't an Eastman, it isn't a Kodak."

The revolution begun in 1888 with the introduction of the Kodak, took another giant step forward in 1900 with the appearance of the Brownie camera. With the Kodak, Eastman had attempted, in his own words to: "...furnish anybody, man, woman or child, who has sufficient intelligence to point a box straight and press a button...with an instrument which altogether removes from the practice of photography the necessity for...any special knowledge of the art." With the Brownie camera, costing just five shillings (one dollar), the financial as well as the technical constraints on photography were finally removed. One hundred thousand Brownies were sold in 1900 alone.

In creating and satisfying a huge, previously untapped, market for popular photography Eastman was to create one of the biggest business empires the world had ever seen. All over the world, the word Kodak became as instantly recognisable as that other great symbol of American commercial imperialism, Coca-Cola. In 1898, *Commerce* magazine predicted: "The year 1888 will rank in the annals of photography as the date of the introduction of the Kodak." The passage of one hundred years has only served to reinforce this prediction.

COLIN HARDING

See also: Camera Design 6: Kodak 1888–1900; and Eastman, George.

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KOREA

By the mid-nineteenth century the Yi Dynasty had ruled Korea since 1392 and a policy of 'no contact' with foreigners had been adopted. A Russian fleet visited the port of Wonsan in 1856 and tried in vain to open a dialogue with the local officials. In 1866 the still deeply conservative regime became concerned over the increasing number of Christian converts and instituted a wholesale massacre. A number of French priests were also killed and, as a result, seven French warships sailed to Kanghwa Island, close to Seoul. When negotiations broke down, the French looted Kanghwa city but were driven off after suffering significant casualties. The same year an American ship, the USS *General Sherman*, tried to open commercial relations. Misunderstandings arose, and when the ship became grounded in the shallow Taedong River, all on board were massacred and the ship was burnt.

Taking stock: Did any of these events give rise to photographic opportunities? The writer has seen one *carte de visite* portrait, from a Shanghai Chinese stu-

dio, of what appears to be a French priest together with other Koreans—presumably escapees from the 1866 persecution. The writer also has in his collection several *cartes de visite* of French origin, which show portraits of unkempt-looking Koreans probably photographed on board a ship. The 1866 French-Korean conflict strongly suggests itself.

In May, 1871 Admiral Rodgers led a fleet of five ships to Kanghwa with the dual purpose of enquiring about the attack on the *General Sherman* and of opening trade relations. Felix Beato was the expedition's photographer. When the American diplomacy failed, Beato was able to photograph the conflict of the 10th and 11th of June—including the carnage inside the captured forts. Beato had gone across to Shanghai by 28th June, and on the 30th June, with the American fleet still in Korea, Beato advertised in the *Shanghai News Letter* the sale of his photograph albums of the conflict! Beato did not believe in wasting time. Albums of the conflict are exceptionally rare, but one example is held by the Library of Congress, another is in the writer's collection.

In September of the same year, John Thomson was on a photographic tour of China and had reached Peking. There he encountered a few Koreans who were part of a mission to China and were on the point of leaving. Thomson was just in time to secure one portrait of two of the officials which is reproduced in his monumental 1873–1874 work, *Illustrations of China and its Peoples.*

In 1874, the American photographer D.R. Clark was in the Far East to photograph the Transit of Venus. He subsequently published a stereoview series in 1875, *Asiatic and Tropical Views,* and included were five views of Korean interest. Clark had photographed a Korean emigrant community living in Vladivostok and the first view, *Natives of Corea,* which is now in the writer's collection, would appear to be the earliest-known photograph to include Korean women.

In 1876, a Korean embassy in Tokyo was photographed, examples of which are in the writer's collection. A fine group of photographs of an 1880 mission to Japan are held by the *Russian Geographical Society*, St. Petersburg. A photograph of an 1883 mission to the United States is in the *Peabody Essex Museum.*

At this time, photographic activity amongst Koreans themselves started to emerge. The first professional Korean photographer was Kim Yong-Won who was a member of both the 1876 and 1880 embassies to Japan. He was helped by a Japanese photographer, Honda Shunosuke, and Kim set up a studio in Korea in 1883. In 1884, both Ji Un-Young, who had studied photography in Japan, and Hwang Chul opened studios. However, no photographs appear to have survived, and there is precious little documentary evidence concerning the activities of these three pioneers.

All three had to contend with widespread ignorance and suspicion of photography. Rumors persisted that photographic chemicals were the residue from cooked local children! Hwang Chul's studio suffered regular stoning. The new technology was also associated with the unpopular Japanese, and the general hostility resulted in all three studios being closed down and destroyed in 1884.

Not surprisingly, these early photographers had confined themselves to portraiture, which they could practise in relative safety. Kim Kyu-Jin, an artist who went to Japan to study photography around 1895, was appointed the first official photographer at the Korean Court, but none of his photographs have been positively identified.

In the final few years of the nineteenth century, photography was given a boost when the King issued an ordinance banning the wearing of the traditional male topknot. Many Koreans wished to preserve an image of what they looked like before complying and photo studios suddenly experienced unprecedented demand. But Korean sources, so far as the writer understands, have yet to positively identify any photograph, taken by a Korean, prior to 1920.

By the late-1880s, however, a succession of amateur Western photographers had photographed the country. The talented amateur and American diplomat, George Foulk (1856–1893) took a number of photographs, examples of which survive in American institutions. In 1883 the American, Percival Lowell, travelled to Korea and in a book which he published in 1885, included twenty-five of his own photographs. The first professional Japanese photographers in Korea seem to have been Honda Shunosuke, and a Kameya Teijiro who died in Korea in 1885 following the setting up of his studio at around this time. Nothing much is known about either of them.

A large part of the Sino-Japanese War of 1894–1895 was fought on Korean soil and photographs were taken by, amongst others, the French artist and cartoonist Georges Bigot (1860–1927), many of whose photographs can be seen at *Kawasaki City Museum*, Japan and John Alfred Vaughan, an engineer on HMS *Undaunted.* Examples of his work are in the writer's collection.

Because Korean photography was so late in getting started, virtually all surviving work is represented in albumen or silver print. Photographic formats include stereoviews, *cabinet*, *cartes de visite,* and lantern slides. All nineteenth-century photography of Korea is rare, and what there is exists mainly outside Korea.

TERRY BENNETT

See also: Beato, Felice; and Thomson, John.

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KOTZSCH, CARL FRIEDRICH AUGUST (1836–1910)

German photographer

Carl Friedrich August Kotzsch was born Sept. 20, 1836, in Loschwitz near Dresden. Working in his father's vineyard he received only a basic formal education. From 1853, the Kotzsch house was host to a colony of artists, mostly students of the well-known graphic artist Ludwig Richter. Around 1860 August Kotzsch began to draw and take photographs. From 1861, August Kotzsch was known as professional photographer in Loschwitz. Around 1870 he began with the production of still life photographs of common fruits like apples, grapes, and quinces, which were placed on simple plates and shelves. Nothing is known about the reasons why he took up these forms of photography hitherto completely alien to the medium except for industrial products. Roughly fifty of these still lifes were produced within a comparatively short time, always using a shadowy daylight—exactly the way Karl Blossfeldt did with his widely acclaimed plant images forty years later. The stunning quality of these still lifes exceed his good quality as a travel and landscape photographer. Curiously enough, these images were recovered from obscurity in the 1980s. After 1895, there is no photograph known from his studio. On October 23, 1910, August Kotzsch died in Loschwitz which he never left farther than walking distance.

ROLF SACHSSE

KRASZNA-KRAUSZ, ANDOR (1904–1989)

The twentieth century career of the photographic publisher Andor Kraszna-Krausz had a decisive impact on the revival of interest in nineteenth century photography, but just how his own interest in the medium came about remains obscure. When setting out in Great Britain in the late 1930s to establish the Focal Press, the imprint that by the 1960s would become the world's largest and most esteemed publishing house for books about photography, film and television, he often reminded people that he had had a long career in Germany working for the Continent's largest specialist photography publisher, Wilhelm Knapp in Leipzig. And this was perfectly true, as far as it went. What remained unsaid was that his experience with Knapp was almost exclusively in Berlin as the film critic and then editor of the leading moving picture trade paper *Die Filmtechnik* from 1925 to 1936. With strong domestic film production dominated by the Universum Film, A. G. (UFA) studios and significant interchange with American producers in Hollywood, Weimar Berlin was, arguably, at the time the leading centre for film criticism and film theory, where Kraszna-Krausz published in parallel with writers like Herbert Ihering, Siegfried Kracauer and Rudolf Arnheim. His lengthy, detailed analyses of films by F. W. Murnau, Fritz Lang, E. A. Dupont, Viktor Sjöström, G. W. Pabst, Charles Chaplin, John Ford, Vslevod Pudovkin, Fred Niblo and others were mixed on Kraszna-Krausz's rich palette with equally incisive notices of documentaries, experimental productions, and animated films. He regularly supplemented his reviews and interviews for *Die Filmtechnik* with intense editorials decrying impersonal commercial productions, the dominance of the star system, and the exorbitant production costs of films, while arguing in other essays on behalf of socially relevant, culturally significant filmmaking and examining the contributions of technicians to the art of filmmaking. But apart from reviews of a few books which included photography, such as Laszlo Moholy-Nagy's *Malerei, Photographie, Film* (Painting, Photography, Film) of 1926, there is little evidence in these years of the passion for photography with which Kraszna-Krausz launched his second career in Britain.

Established in 1938, Kraszna-Krausz's Focal Press at first relied heavily on his former contacts in Germany. Two of Focal's first titles, *Snaps of Children and How to Take Them* along with *A Good Picture Every Time*, both by Alex Strasser, were translations of works published earlier by Knapp in Germany, who also printed the books for the new British publisher. The 1939 title *Phototips on Children: The Psychology, the Technique and the Art of Child Photography* was written by Kraszna-Krausz's longstanding colleague in film criticism, Rudolf Arnheim, together with his wife Mary Arnheim, undoubtedly as they passed through Britain on their way to distinguished new careers in America. One of the earliest books from the press, *The All-in-One Camera Book* by E. Emanuel and F. L. Dash, was a solid success, ultimately running to some 81 editions and remaining in print until the early 1990s. Perhaps encouraged by the

substantive if not yet secure financial platform provided by this book, or perhaps beginning to express the fondness for and sympathy with the culture and history of his adopted country that would become so prominent throughout the remainder of his life, Kraszna-Krausz in the early 1940s began to publish large-format picture books on nineteenth century photography.

Gallery of Immortal Portraits (1940) and *Victorian Photography* (1942) featured works of William Henry Fox Talbot, David Octavius Hill, Julia Margaret Cameron, Roger Fenton, Frank M. Sutcliffe, and others, selected from the permanent collection of the Royal Photographic Society by Alex Strasser and introduced by texts from Kraszna-Krausz. Most importantly, these books reproduced original prints, at a time when 19th century photography was principally known from copy prints that over decades had gradually become more and more "modern" in the sense that they attempted to show the quality of Victorian images through printing them with current techniques. Just how radical these publications were at the time is hard to imagine now given the roll-call of eminent pioneers they brought out of the RPS archive, once-forgotten photographers who are today honoured, studied, collected and many times republished. Comprising volumes 1 and 2 of the *Classics of Photography*, a nascent series cut short by wartime limits on paper supplies, the publications were accompanied by Kraszna-Krausz's own very defensive texts that beg his readers to understand the primitive and awkward photographic technology used in the past, to excuse the photographers' subservience to styles of painting already *passé* when the photographs were made, and to recognise that modern photography had successfully avoided the *cul-de-sac* that trapped the Victorians.

It would seem that Kraszna-Krausz, a committed modernist and advocate of democratic values in both photography and moving pictures, was in these essays beginning to work out for the first time his relationship to the history of photography and to its legacy. After warning his readers that the Victorian photographers had struggled gallantly with crude and undeveloped tools, what Kraszna-Krausz celebrates is their spirit of amateur adventurousness, along with their curiosity and freedom to experiment which in his view saved photography from the habitual and miserly commercialism of the professional studios. Here, Kraszna-Krausz repeats his conviction that honest amateurism was always to be more valued than formulaic professionalism, a view that was also a theme of much of his film criticism in the late 1920s. The idealism that Kraszna-Krausz found in the Victorian photographers was also a fundamental tenet of his new publishing firm, which was committed to providing access for every intelligent reader to modern technical work in filmmaking and photography at the highest level, clearly explained and concisely delivered. By producing unvarnished albums of classic Victorian photography untainted by romantic visions of the past, Andor Kraszna-Krausz allowed a new generation to see their work directly and to recognize the innate qualities which made it a mirror of its period.

DEAC ROSSELL

Biography

Born on 15 January 1904 in Szombathely, Hungary, to Adolf and Irén (Rosenberger) Krausz, Andor Kraszna-Krausz added the unidentified "Kraszna" to his name sometime before 1925, although in that year he experimented with spelling his name in several signed articles as "Kraszna-Krauß," "Kraszna-Kraus," and "Kraszna-Krausz." Little is known about his youth and early education; he was reputed to be an eager photographer from the age of twelve, to have studied law at the University of Budapest, emigrating to Germany in the early 1920s and followed up an intense interest in photography and film at Munich University. By 1925 he was in Berlin, working as a journalist for professional film magazines to which he contributed film reviews, commentary, interviews and occasional book reviews. Appointed in September, 1925, the chief film critic of the trade journal *Die Filmtechnik* published by the specialist photography house of Wilhelm Knapp in Halle, he became the magazine's editor in January 1926 and oversaw every biweekly issue until the summer of 1936, when he left Knapp and Germany, ultimately settling in the United Kingdom. In 1938 Kraszna-Krausz established his own publishing enterprise in London, Focal Press, which became the world's largest photographic publishers, issuing both practical handbooks and books on specialist techniques in photography, film, and television, issuing some 1,500 titles over its first half century. Kraszna-Krausz oversaw every aspect of book production at the Focal Press, which continues today, until he retired in 1978 at the age of seventy-four. He was awarded the Kulturpreis of the German Photographer's Association in 1979, made an honorary fellow of the Royal Photographic Society and the British Kinematograph Society, and established a foundation in 1984 to support research in and award a book prize for photography and film, which upon his death in 1989 received the bulk of his estate.

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KRONE, HERMANN (1827–1916)

Hermann Krone lived most of his life in Dresden, and spent it in pursuits that ranged over photographic experimentation; being a photographer for solar eclipse and transit of Venus expeditions; teaching photography, photo printing processes and art in schools and private lessons; portraiture; and travel photography including stereo images (some of which are held at George Eastman House). He made attempts to get copyright for photographers, did extensive public lecturing on a wide range of scientific and photographic subjects, and created publications which most famously includes a unique *Historisches Lehrmuseum fur Photographie* (Historical Didactic Museum of Photography), actually a group of large pages devoted to documenting many of the photo processes that were or became known in his time. This document was recently published in book form (1998), including all the paper pages, but omitting a small number of glass plate color images and about 900 glass negatives. Krone's teaching and production reputation were international.

The color plates are spectra made by Lippmann's process. Krone was one of the early experimenters in this process and was the first to publish trials of it that omitted the mercury mirror (1892). Instead, the light reflected from the emulsion-air interface interferes with the incoming light. The resulting image has color less saturated than that in the original technique, which used a mercury mirror in contact with the emulsion to create a stronger reflection. Krone's work in this area anticipated Rothe's better-known results by about a decade.

WILLIAM R. ALSCHULER

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KRUGER, JOHAN FRIEDRICH CARL (FRED) (1831–1888)

German landscape photographer and studio owner

Fred Kruger was born on 18 April 1831 in Berlin. He emigrated to Australia in the early 1860s to join his brother's furniture business and later took it over as sole proprietor. In 1866 upon selling the furniture business he became a cabinet maker but also opened a photographic studio in Carlton, Victoria. Kruger was recognised at international exhibitions for his landscape photographs but also photographed the civil progress, scenic views and Botanic Gardens of Geelong, Ballarat and Queenscliff, Victoria extensively. In 1868 he was commissioned to photograph the Aboriginal Cricket Team that toured Australia and which played at Lords. In 1877–1888 he photographed the Aborigines at the Coranderrk Aboriginal Mission Station at the request of the Victorian Board for the Protection of Aborigines; "Badger's Creek, Coranderrk (Aborigines Fishing)" (State Library of Victoria) notably depicts Aboriginal subjects at leisure in the landscape. After settling in Geelong, he received a further commission at Coranderrk in 1883 for physiognomic studies. Kruger's photographs were available individually or presented in albums and were regularly used in the illustrated press. Commissions remained a source of income from property owners and in 1886 the Victorian government requested photographs of the Yan Yean waterworks. Kruger died in Surrey Hills, Melbourne, on 15 February 1888.

JULIA PECK

KÜHN, HEINRICH (1866–1944)

Austrian photographer

(Carl Christian) Heinrich Kühn was born on February 25, 1866, to wealthy parents in Dresden. He studied medicine and natural science in Freiburg in Breisgau. Due to health problems he moved to Innsbruck/Tirol. In the Camera Club Vienna, which he joined in1895, he became acquainted with Hugo Henneberg and Hans Watzek. Kühn is considered an internationally well-known representative of the Austrian Pictorialismus. Numerous personal contacts and connections to the international scene marked his activities. Kühn was friends with Alfred Stieglitz and over three decades lasting exchanges of letters marked their friendship (1899 to 1931). In 1896 he was accepted as a member in the Linked Ring Brotherhood London. The portraits of his children was emphasised in his work. He worked intensively with the technology of the autochrome. After

the loss of his fortune, Kühn operated a private studio in his house. In 1914 he established a photography school in Innsbruck, which had to be closed one year later due to the continuing First World War. The design of a soft-drawing lens named "Imagon," the publication of two photo books about the technology and aesthetics of photography, as well as numerous publications in specialized magazines marked his activity in the 1920s and 1930s. Kühn died on September 14, 1944, in Birgitz/Tirol.

ASTRID LECHNER

KUICHI, UCHIDA; See UCHIDA KUICHI

KUSAKABE KIMBEI (1841–1932)

Japanese photographer and studio owner

Kusakabe Kimbei was one of the most successful photographers in nineteenth-century Japan, operating a studio in Yokohama from where he produced, for foreign residents and tourists, beautifully decorated albums of handcolored albumen prints of both scenery and *genre* subjects. As a result, Kusakabe is better known today in the West than in Japan and usually by his first name, Kimbei, which he used no doubt because it was easier for foreigners to pronounce. Born into a family of textile merchants in Kofu, Yamanashi Prefecture, Kusakabe left home at eighteen to become an artist in Yokohama. Some time in the 1860s he joined Felix Beato**,** initially to assist in the handcoloring of photographs, but than as a studio assistant. He subsequently worked with Baron Raimund Von Stillfried-Ratenicz**.** Kusakabe opened his own Yokohama studio in 1880 and was adept at cultivating foreign patronage—no doubt his time with Beato and Stillfried would have helped in this respect. Becoming a Christian in 1885 would also not have harmed his business and, by the end of the century, he operated the largest studio in Japan. Retiring in 1914 he spent his later years painting. By 1930 his health had worsened and he moved to Ashiya City where he died in 1932.

TERRY BENNET

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LACAN, ERNEST (1828–1879)
French editor and critic

Although Ernest Lacan never practiced photography, he was a central voice in the international photographic community during the second half of the 19th century. As editor and writer for the two leading French photography journals, *La Lumière* [*The Light*] and *Le Moniteur de la Photographie* [*The Monitor of Photography*], from 1851 to 1879 Lacan helped shape the terms of the debate around photographic practice and theory as he strove to articulate photography's cultural significance.

Lacan was born in Paris, France, in 1828, the son of Auguste Théophile Lacan and Marie Josèphe Monodé Devassaux. He studied painting under the artist Léon Cogniet and apprenticed in his studio in the 1840s. Cogniet was a highly regarded history painter with a strong interest in photography and Lacan later credited Cogniet's enthusiasm for stirring his own interest in the new medium. It was with Cogniet's encouragement that in 1849 Lacan first envisioned creating a photography journal, after having decided to give up painting for writing.

In 1851 it was another painter and member of the Société Héliographique**,** Jules-Claude Ziégler, who helped Lacan start *La Lumière,* which first appeared on 9 February under the photography society's auspices. When the society dissolved several months later, photography supplier Alexis Gaudin bought the weekly and appointed Lacan secretary (i.e., manager), then editor-in-chief.

As Europe's first photography journal, *La Lumière* achieved a significant readership in France and internationally, and throughout the 1850s Lacan used its pages to cover technological advances and historical issues, as well as to promote photography within the greater intellectual and artistic community. Dedicated to "Fine Arts, Heliography and Sciences," it sought a broad audience of artists, scientists and scholars as it centered on photography but also encompassed other, carefully chosen topics like the annual Paris Salon.

In his writings and editorial policy, Lacan fought fiercely to defend photography against what he saw as a common misconception that "imagination and artistic feeling play no part in the results." While he exalted photography's many applications, he sought to downplay its commercial reputation, taking pains to distinguish the medium's "amateurs," "artists," and "savants" from the legions of "simple photographers" who toiled in the portrait trade.

Throughout the first half of the 1850s, Lacan wrote regular photography reviews for the journal, addressing the work of some of the most important photographers of the epoch, including Charles Nègre**,** Roger Fenton**,** Edouard Baldus**,** and Olympe Aguado**.** While Lacan's colleague, the critic Francis Wey**,** wrote more generally for the journal on the aesthetics of photography and art, Lacan's reviews mapped out photography's artistic terrain by analyzing specific works with a scrutiny of form and a depth of commentary previously reserved for the other arts. He was among the first to claim that photography had its own schools and styles, and although he believed these initially derived from the different photographic processes, he was convinced that photography "permits each [artist] to take—according to his tastes and the nature of his talent— a different path."

Lacan was reluctant to situate photography squarely within the fine arts, but he saw it as closely related to them rather than an inferior substitute, and his reviews would contribute to securing the photograph's place as an aesthetic object. Even if he never ventured to incorporate its most obvious characteristics— like its reproducibility or mechanical means—into his assessments,

his criticism was exceptional in challenging the limits of what could be considered artistry by including works beyond the scope of other critics. In reviewing the images of English asylum patients taken by Dr. Hugh Welch Diamond, for example, Lacan boldly declared that they "can be ranked, in their execution, among the most beautiful photographic productions."

Given his links to Parisian art circles, Lacan played host to regular photography salons in his Paris home in the 1850s. These informal gatherings bolstered the French photographic community, especially during the crucial period between the dissolution of the Société héliographique in 1851 and the founding of the Société française de la photographie in 1854. Open to an eclectic mix of photographers, writers and other artists, his salons usually included displays of recent photographs made by guests, thereby helping to reinforce the link between photography and aesthetic discourse.

In 1856 Lacan published *Esquisses Photographiques* [Photographic Sketches], a collection of several of his *La Lumière* reviews as well as articles he had written elsewhere on photography's origins and uses. The book was a turning point in Lacan's career, as he would thereafter concentrate his writing more on technical innovations and business reporting. He also took on numerous outside projects, like contributing introductions to books on photography by Claude-Félix Abel Niepce de Saint-Victor (1855) and Alphonse Louis Poitevin (1862), editing a popular weekly, *Le Moniteur Universel* [The Universal Monitor], becoming scientific editor of *La Vie Moderne* [The Modern Life] (1859) and serving as French correspondent for *The Photographic News* in London.

At the end of 1860, after disagreements with Gaudin, Lacan left *La Lumière* to co-found a competing journal, *Le Moniteur de la Photographie,* with Paul Liesegang**,** German publisher of *Photographisches Archiv* [Photographic Archive]. Subtitled "International Journal of the Progress of the New Art," the fortnightly periodical first appeared on 15 March 1861. Primarily addressed at professional photographers, Lacan augmented the editorial staff by inviting respected commercial photographers and printers like Antoine Claudet, Louis Désiré Blanquart-Evrard and André-Adolphe-Eugène Disdéri to contribute articles. Lacan wrote a regular column, reported on technical matters and detailed new applications of photography in fields like criminal investigation and military strategy.

While he continued to review major photography exhibitions like that held at the Universal Exposition, Lacan was less concerned with individual photographers or styles. Perhaps reflecting his journal's stronger commercial slant, he expounded on aesthetic trends within the medium as a whole and often attributing these to technological innovations rather than personal creativity.

In 1870, Liesegang left *Le Moniteur de la Photographie* and Lacan became sole proprietor. He fell gravely ill in the summer of 1878 but continued writing and editing up to his death the following January. His longtime colleague, Léon Vidal, succeeded him as editor and the journal remained in print under various owners until 1914.

Although the writings of other early critics of photography—like Charles Baudelaire and Lady Elizabeth Eastlake—have received greater attention, Lacan's work as a whole provides a comprehensive view of the evolving attitudes and aims that marked photography's first decades. His versatility and energy, not to mention his enduring faith in photography's benefits to society, were rarely matched in his lifetime.

STEPHEN MONTEIRO

Biography

Emmanuel Ernest Auguste Lacan was born in Paris, France in 1828 to Auguste Théophile Lacan and Marie Josèphe Monodé Devassaux. He studied painting under Léon Cogniet and apprenticed in Cogniet's studio in the 1840s. He worked as a librarian before turning to journalism in 1851, helping found the photography journal, *La Lumière,* where he was editor and a regular contributor until 1860. He published a collection of his photography writings, *Esquisses Photographiques* (1856), and contributed to several books on photography. He also published poetry and fiction, including *Le Mort de l'Archevêque de Paris* [The Death of the Archbishop of Paris] (1849) and *Les Petites Gens* [The Little People] (1870). He edited and wrote for *Le Moniteur Universel* from the 1850s through the 1870s, was scientific editor for *La Vie Moderne* (1859), and contributed to other journals published by the Société des Publications Périodiques. He was also a correspondent for *The Photographic News.* Lacan co-founded the weekly journal *Le Moniteur de la Photographie* in 1861, which he published until his death. He was married to Camille Valentine Salle and died in Paris on 18 January, 1879.

See also: Société Héliographique Française; Nègre, Charles; Fenton, Roger; Baldus, Édouard; Aguado de las Marismas, Comte Olympe-Clemente-Alexandre-Auguste and Vicomte Onesipe-Gonsalve; Wey, Francis; Diamond, Hugh Welch; Société Française de Photographie; Niépce de Saint-Victor, Claude Félix Abel; Poitevin, Alphonse Louis; Liesegang, Paul Eduard; Antoine Claudet, Blanquart-Evrard, Louis-Désiré; Disdéri, André-Adolphe-Eugène; Baudelaire, Charles; and Rigby, Lady Elizabeth Eastlake.

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LAFAYETTE, JAMES (JAMES STACK LAUDER) (1853–1923)

James Stack Lauder (1853–1923), photographer, under the name James Lafayette, was born in Dublin on 22 January 1853, the eldest son in the family of six sons and four daughters of Edmund Stanley Lauder (1824–1891), photographer, and his wife Sarah Stack (1828–1913). Edmund was a pioneering and successful photographer who had opened a daguerreotype studio in Dublin in 1853.

In 1880 James Stack Lauder founded his own photography studio, using for the first time the professional name of James Lafayette "late of Paris" and naming his studio variously "Jacques Lafayette," "J. Lafayette," and "Lafayette" as an indication of his artistic training in the City of Lights. He was joined in the new business by his three brothers, all of whom were experienced photographers who had worked in their father's studio. In 1884 he was elected member of the Photographic Society of Great Britain, and thereafter his entries in the multitudinous photographic competitions around Britain and in Europe started winning him medals for "exceptionally fine portraits."

By 1885, the studio's output was praised in print by the Photographic Society of Great Britain as "very beautiful, being distinguished for delicacy of treatment..." and Lafayette's early experiments with hand-colouring produced images that were described as "permanent carbon photographs painted in water-colour on porcelain," and the new specialist photographic press waxed generally lyrical over the fine quality of "Monsieur Lafayette's" portraiture. His work was noted to be of the highest technical excellence. His poses were graceful and good, the flesh was rendered as flesh and the folds of the drapery were rich and effective in the "Rembrandt style." As well as producing a number of faux rustic and cloying images of mother and child in the high Victorian style, Lafayette registered many idylls for copyright at Stationers' Hall. A typical image of this genre, half photograph, half line drawing, made as late as June 1894 has elements of highly sanitised fully-clothed Victorian eroticism depicting, in Lauder's own words, a "group of two figures, girl on ladder gathering apple blossom, man under tree receiving same in his hat, called 'Blossoming Hopes.'"

During the World's Columbian Exposition of 1893, held in Chicago, the foremost German professor of photography, H.W. Vogel, described a portrait of Lafayette's work as the "grandest photographs… He shows great skill in finely arranged single pictures and groups. A suspended angel, almost life-size and taken from life, is remarkable." This floating angel could be considered a rudimentary beginning of special effects photography and it was not until decades later that an employee divulged that the image had been made by photographing the subject lying down on a large sheet of glass over a painted background, so adjusted and so illuminated as to give the proper idea of perspective and the draperies having been arranged on the surface of the glass to give the impression of flight.

In the studio's commercial portraits, Lafayette followed the recipe well-tested from the early days of the daguerreotype when having an image made of oneself suddenly became affordable and no longer the preserve of active patrons of painters. As the subjects of portraits became democratised, the commercial photographer faced the situation of having to make flattering photographs of people who had no experience of sitting for a portrait and Lafayette's art of posing and skill in cropping the prints from his 12" × 15" glass negatives engendered both commercial success and, on 6 March 1887, the grant of a Royal Warrant as "Photographer to Her Majesty at Dublin."

The Royal Warrant, which was subsequently renewed by King Edward VII and George V, conferred enormous prestige, and the style and title of "Photographer Royal" on the studio advertising and promotional literature, proved extremely useful in attracting new clients. The business expanded rapidly in the 1890s. Studios were established in Glasgow (1890), Manchester (1892), and with the expected business bulge in Jubilee year (1897) a branch was opened on London's fashionable Bond Street. Subsequently another studio was established in Belfast (1900). In 1898 all the Lauder family businesses were incorporated and shares in the newly established Lafayette Ltd. were floated on the Stock Exchange.

Lafayette's commercial success coincided with developments in the half-tone printing process, which resulted in the proliferation of illustrated weekly magazines. The firm was one of the first to recognize the opportunities offered by syndicating photographs and portraits of his favourite subjects—"some of the great ladies of the land"—were published in such great numbers as full page covers in *The Queen*, *The Tatler,* and *Chic*, *inter alia*, that *The Lady's Realm* in 1900 stated outright: "It is well-nigh impossible to open any

magazine or paper which contains portraits of present-day celebrities without seeing at least one reproduction of a photograph by the well-known Lafayette house [with its] 'special Lafayette silver process'." By 1897, the fame of his portraits of the great society beauties, such as the Countess of Warwick, Daisy Princess of Pless, and Queen Alexandra, led the critic Levin Carnac (pseudonym of the author George Chetwynd Griffith-Jones) to muse in *Pearson's Magazine* in 1897 that it was "Lafayette's blissful lot to photograph more of the most beautiful and distinguished women of Europe than anyone else." The male was not forgotten and portraits of distinguished men and from society, the stage, and politics appeared prominently in the various new publications, frequently providing the frontispiece and setting the tone for the publication.

The sale of photographic postcards had also become big business, and certain images by Lafayette, such as Queen Alexandra in her Doctor of Music robes, registered for copyright on 28 April 1885, sold over eighty thousand copies by 1900. The Lafayette range of postcards included many images of the British royal family as well as luminaries of the stage, including a seminal series of Sarah Bernhardt as Hamlet from her London season of 1899.

On 2 July 1897, to mark Queen Victoria's Diamond Jubilee, Louisa, Duchess of Devonshire (1832–1911), one of London's foremost political hostesses, held a costume ball with around seven hundred guests ranging from royalty down to aristocracy and a commission went out to Lafayette, who had opened a studio on London's fashionable Bond Street with "patent fog-clearing equipment" earlier that year, to set up a tent in the garden to photograph the guests in costume during the Ball. This would have been a formidable commission for James Stack Lauder, and evidence from the extant negatives shows that he had transported from the Bond Street studio a variety of backdrops and props and, of course, photographic equipment. His remit was to photograph guests who would be in costumes ranging from mythological and ancient Greek down to renaissance and oriental characters. In order to capture the sense of event and location, the studio prepared a new backdrop representing the very lawn and gardens of Devonshire House complete with statuary. Approximately 162 negatives exist from this event, many of which were published by the Duchess of Devonshire in a private album and which represent the studio's largest output from a single photographic session. A copy of this album is held by the National Portrait Gallery, London.

The Lafayette studio, which survived the vicissitudes of World War I and Irish Independence, finally closed in 1952—the Lauder family having been in the business continuously from 1853. A storeroom of negatives, possibly representing the press archive of the studio, was discovered in the attic of a building in Fleet Street in 1968 during building works. The archive was eventually handed to the Victoria & Albert Museum, London, which kept 3,500 glass plate and celluloid negatives dating from 1885 to c 1937. The rest of the collection, consisting of circa forty thousand nitrate negatives from the 1920s to the early 1950s, was given to the National Portrait Gallery.

During the heyday of the Lafayette studio, the ranks of sitters included most of the British royal family, many European royalties, a significant number of maharajas, and official visitors from the Far East. The quality of the studio's portraiture peaked between 1897 and 1920 and was an inspiration to the following generation of photographers, who were more willing to experiment with new styles of lighting and posing. Of the thousands of images credited to Lafayette and which are recognisably portraits in the Lafayette style, only 649 photographs registered for copyright before 1912 bear the signature of James Lauder as author.

James Stack Lauder died at the Hôpital St. Jean, Bruges on 20 August 1923.

RUSSELL HARRIS

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LAI AFONG (active 1850s–1890s)

Although almost nothing is known about his personal life, Lai Afong will probably be remembered as the most significant Chinese photographer of the nineteenth century. Afong, as he preferred to be known, opened his first studio in Hong Kong in around 1859 and continued to operate it until ca. 1900. He assiduously cultivated foreign clientele, employing a succession of foreign assistants such as William Lentz and D.K. Griffith to help him do so. John Thomson spoke highly of his work in his 1875 book, *The Straits of Malacca, Indo-China & China*: "…a man of cultivated taste, and imbued with a wonderful appreciation of art…his pictures, besides being extremely well executed, are remarkable for their artistic choice of position." By the 1870s Afong's advertisements proclaimed him as photographer: "By appointment to H.E. Sir Arthur Kennedy, Governor of Hong Kong, and H.I.H. The Grand Duke Alexis of Russia." He accumulated an impressive portfolio of views from all over China claiming, in 1897, to have more than any other Far-Eastern studio. Apart from his excellent portraiture, he is known for his dramatic views of the 1874 Hong Kong Typhoon and for an exquisite album of Foochow scenery, a copy of which is held by the *Scottish National Portrait Gallery*, Edinburgh.

TERRY BENNETT

LAMBERT & CO., G.R. (1867–1918)

German-born, commercial photographers of Singapore and Malaya

The first known mention of Singapore photographers, G.R. Lambert and Company, was an advertisement (dated 10th April 1867) that appeared in a May edition of the *Singapore Daily Times* announcing the opening of a "Photographic Establishment" at 1 High Street.

The island of Singapore, which lies off the Southern tip of the Malay Peninsula, was established by Sir Stamford Raffles and became a trading post under the East India Company in 1819. It was incorporated with Penang and Malacca to form the Straits Settlements in 1826 and came under British colonial rule in 1867, the same year as Lambert's announcement.

Lambert was a German from Dresden and may of been connected with the Lambert Brothers' carriage makers, undertakers, and masons, who were well established in Singapore.

It appears that at some time after his initial advertisement Lambert returned to Europe, it is not clear whether his first studio failed or not, but another announcement ten years later (in May 1877) told of his return to Singapore, with a studio at 30 Orchard Road (opposite Lambert Brothers' Carriage Works). Interestingly, this advertisement stated that photographs [portraits] were taken daily 7a.m.–11am. It was probably too warm for portraiture after this time. The Orchard Road premises had previously been briefly occupied by another German photographer, G.A. Schleeselmann, who, in turn, had purchased the negatives of former occupant and fellow countryman, Henry Schuren.

By 1878 Lambert had moved studio again, this time to 430 Orchard Road, where he advertised a new collection of Singapore 'views and types.' Lambert visited Siam (Thailand) in late 1879 and returned in February 1880 after being appointed official photographer to the King of Siam.

In fact Lambert & Co. were to become the "official" photographers of South East Asia; they recorded major royal and political visits, government buildings, plus social and sporting events, along with formal portraits of ministers and merchants.

Lambert's studio portraits were mainly comprised of commissioned studies depicting European merchants and their families, as well as local dignitaries. However, there was another body of work that showed native or racial types and these more exotic studies were aimed at the tourist market

In the early and mid 1880s much of the Singapore studios' output by was undertaken by manager, J.C. Van Es and assistant Alexander Koch, who became a partner in 1886. Around this time Lambert himself seems to have returned to Europe leaving the running of the business in the trusted hands of Van Es and Koch.

In 1886 the main studio moved again, this time to number 186 Orchard Road, where they stayed until ca.1902. The firm also operated other studios at 1B and 3A Orchard Road and also at Gresham House in Battery Road. By the early 1900's Lambert and Co. had become the leading photographers in South East Asia, with operators creating landscape and portrait photographs in Borneo, Malaya, Sarawak, Sumatra, Thailand, and elsewhere.

As well as several studios in Singapore, Lambert & Co. had bases in other parts of South East Asia. Heinrich Ernst, Charles Blum, H. Kunz (and others) operated the Lambert studios at Deli and Medan in Sumatra. Photographers H. Stafhell and Charles J. Kleingrothe both worked as assistants to Lambert in Sumatra before setting up on their own as Kleingrothe & Stafhell in 1889. There were also other branch offices situated in Kuala Lumpur and Bangkok.

It is not known which photographers made which "Lambert" images, at least forty different managers, assistants, and photographers were known to have worked for Lambert & Co. at one time or another. Furthermore, negatives and prints by other operators were regularly bought and sold when studios closed or photographers moved overseas.

Considering the number and differing experience of staff employed, the work produced by the company was generally of a high standard and always technically competent, which was quite an achievement considering that the location work was invariably undertaken in hot and humid tropical conditions.

The pictures produced were largely aimed at the European market and documented the rapidly changing face of Singapore, which was constantly growing in size and importance during the end of the 19th and early 20th Centuries. The images produced in remoter areas, often showing local inhabitants, are the most interesting and exotic. The groups were carefully chosen and posed but no attempt was made to document poverty-stricken natives, commercial considerations being prerequisite.

Lambert's operators recorded the growth in trade throughout the area; coffee and rubber plantations, tobacco farms, mines and shipping were all well documented and the resulting images helped promote South East Asia as an attractive place in which to invest.

The images produced by the company were initially produced as albumen prints and later gelatin-silver, and were often gold toned, which helped maintain their color. Later still, platinotype prints were offered. Titles and reference numbers were added to the glass negatives in a variety of styles and the later prints were sometimes embossed with an oval company blindstamp.

By the end of the century, the company had started producing postcards, over 250 views were on offer and reportedly a quarter of a million were sold annually.

The market for photographs was changing, visitors were choosing cheaper postcards over larger and expensive studies and Lambert & Co. started catering for the emerging amateur photographic market, offering cameras, film, and processing facilities. By 1902 the studio at 186 Orchard Road was closed and Gresham House succumbed in 1910. By 1911 the operation was in liquidation and the business was confined to premises at 3A Orchard Road. A succession of managers were brought in, the final one being H. Nugent Buckeridge, who later formed his own photographic business, which lasted until the Second World War. By 1918 Lambert & Co. were, briefly, back at 186 Orchard Road, however the business was in trouble and finally closed the same year. Tastes were changing and with the world's economy in decline, the market for high-quality, expensive prints had ended.

IAN CHARLES SUMNER

Biography

G.R. Lambert, born Dresden, Germany (dates unknown). Part of a large German business community in Singapore. Opened photographic studio in Singapore April 1867 (which may have closed shortly after) returned to Europe, returned to Singapore 1877, and created chain of studios throughout South East Asia. Returned to Europe ca.1886, leaving the operation in the hands of managers. Maintained an interest in the business until ca.1910. Firm ceases trading 1918.

See also: Advertising of Photographic Products; Advertising Uses of Photography; and Koch, Robert.

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LAMPREY, JOHN (active 1860s–1870s)

John Lamprey was Librarian of the Royal Geographical Society and Assistant Secretary of the Ethnological Society of London. Very little is known of him, however his photographic legacy is the system for the production of anthropometric photographs which he published in the *Journal of the Ethnological Society* in 1869. The system was devised for use to both anthropologists and artists for the "comparison of measurement of individuals by some common standard." In poses that refer back to traditional visual modes of mapping the body which had developed since the seventeenth century, the figure was arranged in both full face and in profile poses, with ad-

ditional head studies, in front of the background screen divided into two inch square by means of silk threads. The idea was that the measurements of the body could be read off the scaled photograph so: "the anatomical structure of a good academy figure or a model of six feet can be compared with a Malay of four feet height in height."

Although Lamprey himself is often attributed with the photographs himself, it would appear that he only facilitated them on behalf of the Ethnological Society. Indeed it is not known precisely if he initiated the system or was merely acting on instructions, nor is it clear how subjects were recruited, although a number appear to have been seaman. However the fact the President of the Ethnological Society, the distinguished Darwinian biologist, Thomas Huxley, initiated his own system within months of the publication of Lamprey's system, and with no reference to the latter, suggests that as science the scheme was found wanting in some way. The photographs themselves appear to have been taken for the Ethnological Society by Henry Evans, described as photographer and scientific instrument maker. Evans was prosecuted for the sale of indecent photographs in March 1870, a high-profile case which raised the question of the boarderline between science and pornography. It has often been assumed that the photographs probably commissioned by Lamprey were part of this prosecution. "Men of Science" (probably senior members of the Ethnological Society) petitioned on Evans' behalf, as did artists whom he was supplying with model photographs, including Rossetti and Burne-Jones, but to no avail. Although it was clearly stated that the "scientific" photographs were not those that were the subject of the prosecution, there is another set of photographs in existence, using the same models which are of more questionable intent and are not amongst the sets commonly found in anthropological collections. As Evans' whole stock, including the anthropometric photographs and studies by O. Rejlander, was burned, after his conviction, we shall probably never know.

None the less the system was quite influential, largely because it was one of the few instructions in the field to be published. For instance it resonates through the black and white chequered background used by Portman and Molesworth for their 1894 anthropometric studies of the Andamanese and some Lamprey-system photographs were reproduced in Carl Dammann's *Anthropologisch-Ethnologiches Album in Photographien* (1873–74). The photographs have become iconic of nineteenth century racial beliefs and have been published widely in post-colonial critical studies and art works, for instance Faisal Abdu' Allah' s untitled installation for "The Impossible Science of Being" (Photographers Gallery, London, 1995).

Elizabeth Edwards

See also: Dammann, Carl and Frederick

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LANCASTER, JAMES & SONS (1830–1955)

English photography studio

James Lancaster established his business in Birmingham as a spectacle maker and optician in 1830. The company became J Lancaster and Son around 1876 and in 1905 it became a limited company. It ceased trading circa 1955.

W. J. Lancaster (died 18 September 1925) was the driving force behind the company's rapid expansion into photographic equipment from the early 1870s leading one obituary to describe him as "the pioneer of amateur photography." This was achieved by the adoption of a system of production reported on by George E. Brown in 1930: "The great output of his apparatus was organised on a system which I do not think has been imitated on a similar scale in the photographic trade. He had no factory in the ordinary sense. In Birmingham there have always been a vast number of individual workshops…and all making for Lancaster."

The system of using out-workers to produce parts and to assemble equipment allowed the company to sell reasonable quality cameras and lenses in very large numbers. In 1887 they claimed 25,000 cameras sold, in 1888 sales of over 15,000 Instantograph cameras, in 1894 sales of over 120,000 cameras and 150,000 lenses in the previous ten years, and, in 1898, they claimed to be the largest makers of photographic apparatus in the world with upwards of 200,000 cameras sold. The firm's success was based on offering attractive goods at popular prices.

W. J. Lancaster was granted eighteen patents between 1885 and 1899 which were incorporated into the firm's products with the rotary and see-saw shutters being particularly successful. The firm's first cameras date from the early 1870s when they also offered ferrotype equipment and chemicals, but it was the period from the early 1880s to early 1900s that was the firm's most successful. Their Le Merveilleux, Le Meritoire, and Instantograph cameras were introduced in 1882 and remained popular into the early twentieth century undergoing numerous revisions. The Instantograph had sold over 100,000 by the end of the century. Their watch camera was patented in 1886 and two versions were produced including a compact ladies version, the Rover (1892) was a popular hand camera and a range of

professional studio cameras and multiple lens cameras was also made. Lancaster produced a range of associated accessories and darkroom equipment.

In common with its major rival, Thornton-Pickard, Lancaster failed to respond to the changing demand for smaller plate cameras and simpler amateur roll film cameras. After the First World War the firm declined rapidly with few new cameras being produced; one of it's more successful products was an enlarger. It gradually declined and ceased around 1955.

MICHAEL PRITCHARD

LANDSCAPE

The evolution of every photographic genre is highly determined by a wide range of technical developments. Some technical factors, however, were particularly relevant for the visualization of landscapes, which are characterized by infinity, capriciousness, changeability, an endless amount of tiny details, and ever-changing light conditions. As a result, more than in any other genre, the landscape photographer is obliged to select some of the available options provided by the technical apparatus. Sharpness, for instance, can determine the mood of an image. Whereas a sharp definition enables the landscape photographer to bring forward little details and texture, the use of a wider aperture can push the unfocused zones to the back, rendering a soft and mysterious atmosphere to it. Confronted with subjects in motion, such as waterfalls or sweeping foliage, the photographer has to use a speed short enough to halt the movement, or, by contrast, he can use a certain blur because it suggests movement. A longer exposure time can do justice to the complexity and variety of the image but, simultaneously, it can render the ripples on a water surface invisible. Adjusting the exposure to the terrain implies an overexposure of the sky—this resulted in the typical uniform white skies of many nineteenth-century landscape photographs. The limited sensitivity of the collodion emulsion (especially for greens) and the intense luminosity of the sky made the recording of clouds almost impossible if the exposure was correct for the tonal values of the landscape. Panchromatic films and yellow and red filters circumvented these difficulties, but wet-plate photographers often avoided glaring white skies by the combination of cloud details from another negative during contact printing in the studio.

Nineteenth-century landscape photography was also in another way highly dependent on technical limitations. Since landscapes have to be photographed on the spot, the photographer had to deal with the relative mobility of his equipment. This included first and foremost the huge size and bulk of the field camera itself since negative size determined finished print size before enlarging became easier and more practical in the 1890s. Furthermore, the tools of a landscape photographer also comprised a tripod, a darkroom, developing gear and attachments, silver-coated metal plates or collodion plates, and a box of chemicals. Certainly after the wet-plate process appeared in the 1850s and prior to the introduction of the silver gelatin dry plate in 1871, the landscape photographer had to carry with him a whole laboratory; specially because collodion plates had to be exposed while still wet—and therefore prepared *in situ*—and developed immediately after the exposure had been made.

Landscape photography, of course, was also highly dependent on the availability and accessibility of its subject. In light of this, the genre is not only a component of the modern invention of photography but also a product of modern urban culture and its attitude *vis-à-vis* natural surroundings. The nineteenth century, after all, was an age characterized by the opening up of all kinds of territories. Within the context of the colonial enterprise, travelers and explorers discovered and charted other continents. Photography unmistakably contributed to both the physical and cultural appropriation of exotic territories and the continuous exploration and settlements of new lands. In its own way, photography was a form of mapping and it allowed the land to be controlled, visually at least. It contributed to the practical and symbolical management of the vast colonial territories which demanded the classifying, recording, census-taking, and mapping of everything in order to render it knowable, imaginable and controllable by means of European systems and on European terms.

At home, the European landscape came within reach through the railways and, at the end of the century, the bicycle. The photography of landscapes and scenery was encouraged by tourism, a modern phenomenon inherently linked with the massive production, distribution, and consumption of (mechanical) images. In the industrializing nations, railroads made formerly isolated regions accessible to new classes of travel consumers. These included middle-class families on a limited budget and schedule, who purchased photographic views as souvenirs. Later, when do-it-yourself mass consumer photography developed shortly before the turn of the century, they took their own pictures.

Furthermore, the genre of landscape photography was not only the product of new kinds of image production and new ways of approaching the lands but also of specific ways of looking at natural surroundings and the countryside. After all, throughout the nineteenth century, landscape and nature were not only important motifs in photography, they were pre-eminent themes and motifs in painting and literature as well. What's more, landscape photography was unmistakably influenced by literary and pictorial conventions. Landscape photographs confirm that the very notion of landscape

Russell, Andrew Joseph.
Hanging Rock, Foot of Echo Canyon.
The Metropolitan Museum of Art, Purchase, The Horace W. Goldsmith Foundation Gift, 1986 (1986.1196) Image © The Metropolitan Museum of Art.

was connected to picture making and aesthetic conceptualizations from the beginning. According to the *Oxford English Dictionary*, the term "landscape" occurred for the first time in 1603 and stood for "a picture representing natural inland scenery." The word was borrowed from the Dutch *landschap*, probably because of the influence and the prestige of landscape painting of the Netherlands. In most languages, the word has the double meaning of both a "piece of land, region" and an "image" representing such a piece of land. This double meaning is telling. It focuses our attention on the fact that landscape has not exclusively been a piece of the environment or nature, but has been, from the very first, dependent on its structuring by human presence and by the gaze in particular.

The importance of landscape and nature in nineteenth-century literature, painting, and photography was also endorsed by new aesthetic concepts, which originated in the late eighteenth century, on the eve of industrialization and shortly before the inception of photography. New notions, such as the sublime and the picturesque, presented the natural site not only as an ideal setting for beautiful or heroic acts, but rather as a primary source of meaning in itself. Throughout the nineteenth century, many photographers were eager to demonstrate that their new medium was perfectly suitable for visualizing these new sensibilities and to create photographic equivalents of literary and pictorial evocations of nature.

Particularly the concept of the picturesque, the development of which had been closely related to that of the English landscape garden, became a popular guideline for many landscape photographers, both professionals and amateurs. William Gilpin, the pre-eminent theorist of the picturesque, had argued in the late eighteenth century that picturesque views should be irregular, highly textured, and composed of things rugged, rustic, or antique, stripped of their utilitarian associations. Such telling details would provoke in the sensitive viewer poetic reflection on the passage of time, on the brevity of glory, and on the ephemeral nature of human achievement. Preferring the whimsicalness of nature, however, the aesthetics of the picturesque approached nature indirectly, through *pictures*. The term picturesque, consequently, refers both to a certain kind of landscape, which is suited as a subject for a painting, and to a fragment of reality that could be viewed as if it would be part of a painting. On the one hand, the English landscape gardens were designed to be viewed as a Claude Lorrain or a Nicolas Poussin might paint them. On the other, the viewer could discover and recognize picturesque scenes in nature itself. In his *Three Essays* on the picturesque (1794), Gilpin encouraged travelers, for instance, "to frame views, to graduate prospects from foreground to background, and above all to ensure variety of painted, drawn or engraved texture, which minimized similar qualities in the natural world."

A few decades later, this was right up the alley of photographers, who often used their cameras to frame similar views of the landscape. In particular British pioneers, such as John Dillwyn Llewelyn and Benjamin Brecknell Turner, and photographers of the 1850s and

1860s, such as Roger Fenton, George Washington Wilson, Francis Bedford, and William England, followed in the footsteps of the theorists and painters of the picturesque. Fenton even photographed the very same locations that Gilpin had depicted earlier in his watercolours. Other photographers referred explicitly to the concept of the picturesque in their writings. In the *British Journal of Photography* (1864), George Washington Wilson described the picturesque as "a simple viewpoint that the traveler or amateur would easily find for themselves; a convergence point toward which the eye is drawn imperceptibly by a gradation of tones and a dark foreground; a harmony of all the parts, in a closed composition which does not arouse unsatisfied curiosity." In his *Pictorial Effect in Photography* (1869), a true bestseller among photographers in England and abroad, Henry Peach Robinson quoted extensively from eighteenth-century writers on the picturesque. He also noted that the power of the art of photography was limited. "The sublime cannot be reached by it," Robinson wrote, but "picturesqueness had never had so perfect an interpreter" as photography.

In the second half of the nineteenth century, however, the picturesque was often freely interpreted as denoting any landscape endowed with scenic charm. The general and vague notion of what constitutes the picturesque became an inherent part of the Victorian imagination. It also became an imperative for every successful landscape photographer, whose task included searching and framing strategically the right sort of locations, and articulating their physical subtleties through proper exposure of the negative. Furthermore, photography democratized the picturesque, which originally entailed an exclusive capacity of the gentry, who understood both art and touring. Now, the middle classes used photography to enjoy nature. This cult of the picturesque resulted in thousands of photographs of humble landscapes and pastoral scenes that mostly ignored the brutality of urban modernization, labor, and industry. Figures and landscapes were integrated into a harmonious unity evoking a well-balanced social order. The predilection for the countryside and the peaceful village—objects already resonant with English values—transformed the notion of the picturesque into an ideological concept that contributed to the construction of a national identity.

Consequently, the frame of the picturesque turned out to be useful in the photographic survey of the colonies. Exotic landscapes were tamed and domesticated according to established terms of reference reflected in the photograph's composition and treatment of subject. Samuel Bourne's pictures, for instance, of the unwieldy and very often "un-picturesque" topography encountered on his treks in the Himalayas were unmistakably influenced by his earlier search for picturesque scenery in Wales, Scotland, and the Lake District. In many of his pictures taken in Northern India in the 1860s, spaces are contained within enclosures, encirclements, or boundaries. The world arranges itself for the viewer. The struggle with nature gave way for contemplation based on balanced proportions, carefully selected viewpoints, the use of watery reflections, and the harmonious integration of foregrounds and backgrounds—all borrowed from the tradition of the picturesque. Nonetheless, as many pictures by other European photographers working in exotic locations, Bourne's photographs are characterized by an interesting tension caused by his frustrations over trying to frame the vast spectacle of terrain within his camera's field of view and still maintain a balanced composition and containment of suitable picturesque features.

Bourne's vistas of breathtaking landscapes from the peripheries of the British empire also demonstrate that, at the time of the mid-nineteenth century proliferation of photography, the conventions of the picturesque had merged with those of the sublime. The characteristics that Edmund Burke had attributed to the sublime—obscurity, privation, vastness, magnificence, and so on—were clearly evoked in the grandeur of the exotic landscapes in Asia and the Americas that were beyond exact description. At the same time, however, painters and photographers evoked the sublime by means of a repertoire of established compositional formulae. Landscape photography, in a way, helped to domesticate the sublime and to subject it to pictorial conventions—a logic that constitutes the strategy of the picturesque.

The tension between the rough subject matter of the wilderness and the cultivated framings of the gaze was also a challenge to American photographers such as William Henry Jackson, Eadweard Muybridge, Andrew J. Russell, Carleton Watkins, and Timothy O'Sullivan, among others. Many of them worked in the context of government topographical expeditions and geological surveys, which helped to open the vast territories of the West to phenomena such as railroad construction, logging, mining, farming, urbanization, and even tourism. Whereas the 1859 stereographs of the Catskill Mountains and Niagara Falls by William England still could answer to picturesque conventions, the survey photographers working after the Civil War entered completely new kinds of lands. In contrast with the celebration of the newly found harmony between man and nature celebrated in European landscape photography, American photographers faced a frightening wilderness that, from an artistic point of view, could only be interpreted as a chaotic environment unfit for lyrical depictions. The spectacular natural scenery of the Americas lacked the picturesque balance of hills, lakes, and trees. Nonetheless, it was difficult for the painters and photographers of the American wilderness to accept nature in a naked, non-referential condition

and many of their impressive views are characterized by formulas derived from, but not coextensive with, the picturesque and sublime modes of landscape depiction. Comparable with the landscape painting by artists such as Albert Bierstadt, Frederic Edwin Church, Sanford Robinson Gifford, and Thomas Moran, the American survey photographers adopted and reformulated pictorial landscape conventions and merged them with a heretofore unmatched technical virtuosity. Joel Snyder demonstrated that critical literature of the period commended photographers for having achieved pictures faithful to nature that "coincidentally" shared specific compositional and pictorial features with landscapes wrought in other media such as painting and drawing. In other words, photographers were congratulated not for their use of landscape conventions but for their coincidental or mechanical corroboration of them.

Nonetheless, American landscape photography does not show the pastoral harmony so typical of the English interpretation of the picturesque. When pictures allude to a landscape claimed and occupied by man, not classical culture but modern industrialization enters the frame. Carleton Watkins' mining and railroad photographs in particular, for instance, attempted to portray a visual harmony between the land and the new tokens of industrial progress such as tracks of a new rail line.

In contrast with the European picturesque, however, man and civilisation are usually absent in the pictures of the American surveyors. In the spectacular large-format views of the American landscape from the 1860s and 1870s, man is often confronted with a terrifying emptiness and vastness reminiscent of the sublime in the way Edmund Burke had written about it in the eighteenth century. Moreover, compared with most examples of European landscape photography, the pictures of the American West are characterized by a more dispassionate and "placeless" look due to high vantage points, uninterrupted lines of vision, and marginal foregrounds. Miniscule figures frequently give a sense of scale and measure to the landscape but instead of mediating between the viewer and the depicted scene, they are dwarfed by the daunting natural marvels. Men are reduced to indices of the precarious and frightening relationship between man and nature. Unmistakably refering to the then popular theory of Catastrophism, a geological theory which held that the world was shaped by periodic and large-scale disasters, these landscape photographs supported a transcendentalist vision of nature. The American landscape was not only interpreted as an impressive physical reality but it also included an underlying sense of the spiritual. Nature was presented as a stage of a symbolical presence. In some pictures, *chiaroscuro* creates a natural drama. Specific viewpoints and lighting exaggerate the sudden and violent forces required to create certain geological formations. In others, a kind of overwhelming silence results in an unusually modern, austere imagery. This is especially the case in many photographs by Timothy O'Sullivan, who preferred landscapes that seem to resist definition, such as immeasurable and inaccessible deserts. His photographs show landscapes so devoid of human reference, so lacking in the signs of history and culture, that plastic values were the only one at hand. O'Sullivan's landscapes, in consequence, can be considered the point of departure for both the modernist landscape photography of Ansel Adams and the late-twentieth-century predilection for natural and urban wastelands and non-descript areas. O'Sullivan's landscapes deny the possibility of comfortable habitation and an agreeable relation between man and the bleak and godforsaken landscape.

Strikingly, this specific evocation of the American frontier lasted only a few decades. The initial flourishing of American landscape photography passed with the closing of the frontier, to which photography contributed in contradictory ways. On the one hand, American western landscape photographs had opened the West by presenting it as potential real estate and as a site for eastern investment and development. On the other, the photographs of the natural wonders struck a romantic chord among the public and positively influenced legislation to create the first National Parks in the early 1870s. By the 1880s, photography and travel had become easier and the closing of the frontier at the end of the century was confirmed by the more impressionist approaches, which also characterized the European landscape photography of the *fin de siècle*. In the 1890s, Henry Hamilton Bennett, for instance, depicted the Wisconsin landscape as an ideal place for leisure whereas in the early landscapes of American pictorialists, every suggestion of harshness and difficulty was suppressed. The bitter cold, the cruel heat, and the infinite spaces made way for a nature that had become a part of the known habitat and the conventions of art.

Artistic conventions and cultural references also continued to play an important part in the landscape photography of many European countries. Although the picturesque quickly became a component of a kind of "Englishness," the concept was also instructive for the landscape photography practised in other regions. Many photographers with pictorial sensibilities, for instance, directed their cameras at the Italian landscape, which played such an important role in European culture in general. With its ruinous remnants of antiquity, the Italian landscape remained a reference point for artists throughout the nineteenth century. In addition, it had been a major source of inspiration for the aesthetics of the picturesque. Its enjoyment and depiction became obligatory components of the Grand Tour. Right from its inception, photography superseded the eighteenth-century *vedutismo*, the paintings of panoramic views

of places. Daguerreotypes and calotypes offered the traveler excellent "diary" potential and in the second half of the nineteenth century, other photographic processes documented, besides architecture and monuments, the countryside and mountain scenery. The Roman *campagna*, the ultimate landscape considered worthy of pictorial representation since centuries, was photographed abundantly. In the 1850s, Giacomo Caneva made a series of impressive views, some of them intended for French artists staying at the Villa Medici. During the following decades, many others, such as Ludovico Tuminello, Pietro Dovizielli, Pietro Poppi, and Federico Faruffini, made numerous studies of nature, with or without figures. At the end of the century, professional studios, such as that of the Alinari brothers in Florence, a firm specialized in pictures of artworks and architecture, also provided landscapes for the tourist market. Foreign photographers as well, such as Robert MacPherson in the 1850s, made *vedute* for tourists. With an exceptional mastery of technique, MacPherson photographed, mostly in large formats, the Latium countryside and he made many beautifully composed landscapes, such as his pictures of the ruins of Tivoli, which seem to be organically connected with the natural surroundings.

Some specific impressive locations, such as the Vesuvius, which combined classical references with a romantic fascination for the sublime, attracted many photographers such as the pioneer Calvert Richard Jones in the 1840s and Giorgio Sommer in the 1860s and 1870s. From across the bay, Sommer made spectacular photographs of the enormous plume of smoke during the eruption of the volcano in 1872. Others of his photographs, as well as pictures taken by John Buckley Greene earlier, show an exceptionally modernist sensibility for abstract shapes by focusing their attention to the volcanic concretions instead of the broad view of the Naples Gulf.

Another spectacular landscape explored by many European photographers were the Alps, which both had fascinated northern artists on their way to Italy since the renaissance and which had become a *locus classicus* of romanticism and the cult of the sublime in the late eighteenth century. Noël Marie Lerebours included an Alpine view in his famous *Excursions daguerriènnes* (1840–44), John Ruskin commissioned Frederick Crawley to make daguerreotypes of the Mont Blanc in 1854, and William England immortalized the snow-covered tops in a series of stereographs. In addition, Vittorio Sella depicted the Italian Alpine topography with an already modern dedication that evaded the often superficial curiosity of the Grand Tour. Sella even specialized in mountain pictures operating, between 1887 and 1908, in such remote and exotic areas as the Caucasus, the Himalayas, Karakorum, and Alaska. The Italian Alps, however, were his favourite terrain. Here, in 1879, he made his first of several panoramas consisting of four or five adjacent pictures. His photographs became an important reference point for geographical and botanical societies, cartographers, geologists, and, of course, alpinists.

Some prominent French photographers explored the Alps as well. The German but Paris-based pioneer Friedrich Martens made daguerreotypes of the high mountains in 1853–54, Ferrier made a series of stereographs in 1856, and Charles Soulier made a series of views in 1869. The most spectacular examples of Alpine photography, however, were created by the Bisson Brothers and Adolphe Braun. From 1854 onwards, Louis-Auguste and Auguste-Rosalie Bisson made increasingly better shots of the high mountains. In difficult conditions, they not only managed to get the fluid collodion under control, they also produced a series of impressive large prints (as big as 70 × 100 cm) characterized by subtly balanced tonal values—no sinecure in the midst of the high contrasts of the snowy landscapes. Initially, their carefully selected viewpoints, which render a sense of depth to the landscape, were unmistakably indebted to the tradition of the picturesque. Later on, however, their snowscapes were characterized by a more austere approach showing mountaineers dwarfed by the fanciful shapes of the glaciers, and the imposing formations of the terrain and the mountain tops. Together with the seascapes of Le Gray and the architectural photographs by Baldus, the Bisson's Alpine views can be considered one of the highlights of the golden age of French photography around the middle of the century.

Sparkling Alpine scenery was also a favorite subject of Adolphe Braun, who was one of the largest producers of commercial landscape views in France during the second half of the nineteenth century. In 1866, an observer claimed that it was virtually impossible to take a step in Switzerland without stumbling upon a shop selling Braun prints and stereoviews. Based in Mulhouse, Braun turned his attention to scenic photography in 1859 with the publication of his *L'Album de l'Alsace*, a collection of large-plate views of sights, monuments, and landscapes, which were clearly indebted to previously published engravings of Alsatian views, such as Jacques Rothmuller's *Vues pittoresques*. Braun depicted the Alps, especially in Switzerland, Northern Italy, and the then recently acquired Haute-Savoie region, not only by means of large-plate views (sometimes using panoramic techniques) but also by stereographs, which were especially suited to the introduction of figures because of their palpable sensation of depth.

Braun's collection of landscapes also includes scenery in which picturesque ruins have been exchanged for tokens of modernity, such as the construction of the Gotthard Pass rail tunnel in the 1870s. This celebra-

tion of the modernity of the landscape can be found frequently in French nineteenth-century photography. In 1855, Edouard Baldus created this truly separate genre when he photographed the landscape between Boulogne and Paris changed by the construction of the railroad. In contrast with the usual picturesque approach that neglects the traces of industrial modernity, Baldus' photographs strikingly showed how all kinds of new constructions, such as railway tracks, viaducts, and bridges, fitted perfectly into the landscape. During the following decades, the photographers employed by the Ecole des Ponts et Chaussées and many others would depict the spectacle of railroad construction—an indication of the importance railroads had assumed both in the changing landscape and in the public consciousness.

This modern stance in French photography can also be found in the interest in the landscape of the everyday. As in other countries, the development of French landscape photography was unmistakably closely connected to the practise and theory of landscape painting. In France, however, other pictorial codes than those of the picturesque and the sublime were much more relevant. The work of many French landscape photographers shows similarities, for instance, with the new realist and naturalist tendencies in painting that developed in the era of photography's inception. The forest of Fontainebleau, which attracted the painters of the so-called Barbizon circle (Corot, Diaz, Millet, Rousseau) between 1825 and 1860, also became a popular photographic motif during and after the Second Empire. Painters and photographers were not only engaged in documenting a way of life they saw as rapidly slipping away under the pressures of industrialization, they also searched for humble subjects that contrasted heavily with the overworked picturesque formulas and sublime and pompous themes of academic painting.

Averse to classical *vedute* and spectacularly sublime mountain tops, photographers such as Gustave Le Gray, Alfred Briquet, Eugène Cuvelier, Constant-Alexandre Famin, Achile Quinet, Ernest Landrey, John Buckley Greene, Paul Berthier, and Henri Langerock, among others, depicted various locations in the forest that became more accessible by the railways from the 1850s onwards. Some photographers made "Studies from Nature," supplying painters with documentation, such as the *Vues artistiques diverses* by Famin. Others, such as Le Gray and Cuvelier, were painters themselves and made highly personal photographic works that often focuses on a gloomy and melancholy aspect of nature. After 1849, Le Gray made many calotypes of trees and underwood, and he later continued the series using large-size glass negatives. The perfection of his prints and their sensibility for lights and shades answer to a pre-Impressionist naturalism that owed little to traditional pictorial examples. Another photographer closely connected to the circle of Barbizon painters, was Eugène Cuvelier, who particularly explored the rocks and sand dunes of the forest and, in doing so, created pictures reminiscent of the Rousseau's paintings in particular. He remained faithful to the calotype and fully exploited its aesthetic possibilities: the thickness of the paper negative and its grainy texture resulted in the sketchy details and schematic light effects so cherished by the Barbizon painters and the impressionists.

Many works of the Barbizon photographers show a remarkable, "impressionist" interest in the play of light, reaching its climax in Gustave Le Gray's series of large-format seascapes. Some of Le Gray's "marine" studies give an impression of an instantaneity, which can suddenly capture the impetuous movement of the waves. Constructed by means of two separate negatives (one for the sea, the other for the sky), his more tranquil seascapes skilfully capture the ways light moves over the ocean and show backlit skies heavy with clouds or the sky at sunset.

French landscape photography also included other specific motifs from contemporary impressionist painting, which, in its turn, borrowed formal features from the new medium of photography: absence of depth, abstraction through unusual viewpoints, arbitrary framings, and so forth. The impressionist fashion for the outdoors, for instance, resulted in the topographical genre of middle-class pastimes. Comparable to famous scenes by the impressionists, people at leisure were photographed in the outskirts of Paris or in the recently developed seaside resorts. Olympe Aguado, an amateur photographer close to the Emperor, was the leading exponent of this genre that gave evidence of the urbanization and domestication of the landscape. It was no accident that the places painted by the impressionists were the suburban landscapes within several hours' train commute of Paris. As in many impressionist paintings, in French landscape photography, nature is no longer the background of heroic acts (as in classical landscape painting) or of the sublime terror of natural forces (as in Romanticism), but has been translated into the environment of the *bourgeois* on a summer Sunday afternoon. As in the landscapes of the Barbizon painters and the impressionists, a great deal of French landscape photography is characterized by a dichotomy between nostalgia for a vanishing agrarian past and an interest in the emblems of industrial modernity and a specifically modern way of occupying natural surroundings.

Characteristics of Barbizon and impressionist painting would continue to play an important part in the landscape photography of many countries up until the very end of the century. Both an impressionist optics and a preference for landscape and peasant subjects also marked the late nineteenth-century vogue mode of pictorialist photography—yet another indication of the

close connection between pictorial and photographic landscape depictions throughout the nineteenth century. Corot's paintings, for instance, were a major source of inspiration for pictorialist photographers such as Peter Henry Emerson, who applauded Millet and Corot in his book *Naturalistic Photography for Students of the Art* (1893), and Léonard Misonne, who was aptly called the "Corot of photography." Many pictures by George Davidson, Alfred Horsley Hinton, Robert Demachy, James Craig Annan, Hugo Henneberg, Hans Watzek, Theodor and Oskar Hofmeister, the young Edward Steichen, and Alfred Stieglitz, among others, refer unmistakably to an impressionist aesthetics, which translated specific motifs such as people engaged in rural labor or outdoor activities into tonalist studies of transient elements. Paradoxically, pictorialism presented itself as the ultimate style of landscape depiction by both evading and stressing the inherent limitations of landscape photography. It ignored the infinite amount of details and attempted to suggest or to evoke movements and atmospheric effects, which photography cannot represent by definition. Using a selective focusing to restore actual optic sensations and capturing the general effect of landscape, definition of form was sacrificed to a diffused field of tonal landscape. All kinds of ephemeral atmospheric effects, such as smoke, haze, mist, or fog, were rendered in mediating tones. Impressionist motives such as trees, foliage, streams, and clouds became the material upon which the artist's manual influence could be exercised resulting in uniquely crafted gum prints. Furthermore, by abstracting the landscape, pictorialism stressed the idea that the landscape and nature itself possessed an essential character or emotion. No longer a depiction based on objective observation, pictorialism presented landscapes of carriers of personal expressions and feelings. Many pictorialist landscapes evoke a deep melancholy reminiscent of Symbolism. They seem to indicate the existence of a spiritual dimension of nature rather than an Impressionist depiction of the material world in terms of sensory perception. Also the medium of photography was considered capable of depicting landscapes of the mind.

STEVEN JACOBS

See also: Bisson, Louis-Auguste and Auguste-Rosalie; Bourne, Samuel; Braun, Adolphe; Cuvelier, Eugène; Expedition and Survey Photography; Fenton, Roger; Jackson, William Henry; Imperialism and Colonialism; Impressionistic Photography; LeGray, Gustave; Mountain Photography; Nature; O'Sullivan, Timothy Henry; Painters and Photography; Robinson, Henry Peach; Russell, Andrew Joseph; Sea Photography; Sky and Cloud Photography; Watkins, Carleton; Llewelyn, John Dillwyn; Fenton, Roger; Wilson, George Washington; Frith, Francis; Turner, Benjamin Brecknell; Bedford, Francis; England, William; Robinson, Henry Peach; Bourne, Samuel; Jackson, William Henry; Russell, Andrew Joseph; Watkins, Carleton Eugene, O'Sullivan, Timothy Henry, Caneva, Giacomo; Lemercier, Lerebours & Bareswill; Ruskin, John; Sommer, Giorgio; Jones, Calvert Richard; Greene, John Beasly; Alinari, Fratelli; Martens, Friedrich; Leon, Moyse & Levy, Issac, Ferrier, Claude-Marie, and Charles Soulier; Bisson, Louis-Auguste and Auguste-Rosalie; le Gray, Gustave, Baldus, Édouard; and Emerson, Peter Henry.

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LANGENHEIM, FRIEDRICH (1809–1879) AND WILHELM (1807–1874)

The Langenheim brothers, Ernst Wilhelm, and Friedrich, were born in Braunschweig in Germany, and emigrated to America, Friedrich in the early 1830s—probably around 1834—and Wilhelm probably c.1840. Sometime after arriving in America, they both anglicised their names, becoming known as Frederick and William.

William is known to have studied for a law degree in Gottingen, Germany, before emigrating to America and settling in Texas where he helped establish a settlement near San Antonio. He served in the army during the Texan War of Independence (1835–36) under General Sam Houston, and despite escaping from San Antonio just days before the fall of the Alamo, was captured and imprisoned for eleven months at Matamoras by the Mexicans. After being released, he is believed to

have worked both as a soldier and as an army clerk in Florida and New Orleans before joining his brother in Philadelphia c.1840. Friedrich worked as a journalist for the German language newspaper *Alte und Neue Welde* owned and edited by George Francis Schreiber before joining his brother in their first photographic studio. After acquiring a daguerreotype camera from Von Voigtländer, Friedrich Langenheim and Schreiber were briefly in partnership. Where William learned photography is unknown.

By 1843, the brothers were listed in a Philadelphia trade directory as operating a studio at 26–27 Exchange, Philadelphia. In their partnership, William assumed the role of senior partner.

Unusually, and perhaps reflecting their European background, by the late 1840s they offered their clientele photographs taken using both the daguerreoype and the calotype process. Calotypists were, at that time, relatively uncommon in America. So impressed was William by the calotype that he had Frederick negotiate with Talbot for the American patent rights for the paper negative process—acquired in 1849—and spent some considerable time modifying and perfecting it to suit the conditions in Philadelphia. Three significant letters from Frederick to Talbot survive in the collection of the National Museum of Photography, Film and Television, Bradford, England.

In the first of these letters, dated 10th June 1849 Frederick wrote to Talbot at length, noting

> We had the pleasure to receive a communication from our W. Langenheim, informing us of the effectual arrangement he had succeeded in making with you in regard to the purchase of your Patent. It is our interest, but it will be an especial pleasure to us to promote and perfect your invaluable invention, and in a very short time we hope to be able to send you a few specimens of Talbotypes, which will surpass in sharpness and delicacy of shading even a good Daguerreotype.
>
> The Talbotypes have created a great sensation all over the United States, and most papers of any standing contain favorable articles on the subject, among a great number of which we refer only to the Daily National Intelligencer, Washington, of May 12, which contains a long article on the subject, and which it may perhaps interest you to read.
>
> But the Talbotypes have also created a great deal of envy among our opponents and doubtless attempts will be made to infringe upon our purchased right, against which we have to guard with every possible care, and in which effort we hope you will lend us your aid.

The letters from William Langenheim to Talbot, to which Frederick refers, may yet be discovered. It is known that the Langenheims sent Talbot examples of their calotypes—including views of Philadelphia.

The exact nature of the brothers' partnership remains unclear, and although Frederick wrote to Talbot in 1854 of the failure of W. & F. Langenheim three years earlier, Frederick himself was listed as operating a daguerreotype studio in New York in 1845 and 1846—at 201 Broadway—and from 1846 until 1849 as being in partnership with Alexander Beckers. It may well be that Langenheim established the studio, trained Beckers, and then left him to manage it. As the Langenheims' sister was married to Peter Friedrich Von Voigtländer, it is perhaps not surprising that Langenheim & Beckers advertised themselves in the later 1840s as sole agents for Von Voigtländer's innovative metal-bodied daguerreotype camera and Professor Petzval's fast lens.

While in New York, Frederick travelled to, and photographed, Niagara Falls, one of his images being used as the basis for an engraving published in 1845. In the following year he took out a patent (US Patent 4370 1846) for colouring daguerreotypes, by which time both the Philadelphia and New York studios had earned much praise for the quality of their daguerreotype portraits.

As early as 1846 the brothers had become interested in the idea of projecting photographic images, and had imported episcopes from Vienna and experimented, with some success, at projecting daguerreotypes on to a screen. Recognising that the quality of the projected image from a reflected daguerreotype was not ideal, they experimented from 1848 with the creation of glass diapositives from glass and paper negatives using Niepce de St. Victor's albumen-on glass-process, the resulting process, which they patented in 1850s, becoming known as the Hyalotype. The involvement of a rival claimant to the invention, George Schreiber with whom Frederick had worked in the early 1840s, was described in an essay in *The American Journal of Photography* 13 no.137, in 1892. In that essay, Schreiber is said to have produced the first positive on ground glass c.1848.

The impact of the Hyalotype on the social history of photography was far reaching, turning the magic lantern into an important educational and information tool. Their catalogue of glass stereo diapositives would eventually become extensive.

By 1850, the brothers advertised themselves as "Daguerreotypists and Calotypists," and in that year they produced *Views in North America, Taken from Nature July 1850 by the Patent Talbotype Process* comprising just over one hundred images, but by the following year, despite continuing commercial and critical success, and being awarded medals at the Great Exhibition in London, their partnership had been dissolved. Frederick then left for a three-year sojourn in South America where, as he told Talbot in a letter upon his return in 1854, he had gone "to revive [his] spirits after the failure of the firm W. & F. Langenheim." William continued in business on his own, expanding the company's catalogue of lantern slide views

The brothers' partnership was renewed in 1854 and

by 1861, styling themselves the American Stereoscopic Company, they were producing lantern slides and stereo diapositives in huge numbers.

The brothers remained active in marketing photographs until William's death in 1874, after which Frederick retired and the company was sold.

JOHN HANNAVY

See also: von Voigtländer, Baron Peter Wilhelm Friedrich; Daguerreotype; Calotype and Talbotype; Talbot, William Henry Fox; and Petzval, Josef Maximilian.

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LANGLOIS, JEAN-CHARLES (1789–1870)

French war photographer

The Crimean War photographs taken by Colonel Jean-Charles Langlois either on his own or with Léon-Eugene Méhédin and Friedrich Martens offer a much more chilling image of the war than Roger Fenton's more celebrated productions.

He was born in Beaumont-sur-Auge, Calvados, in 1879, the year of the French Revolution, and later joined the French army. He served in campaigns up until 1815, when he embarked on a study of painting before returning to his military career, but as an artist not as a soldier.

He developed an interest in panorama painting before 1830, later translated into an interest in panoramic photography. Posted to Algeria in 1833, he made numerous sketches which resulted in his remarkable *Panorama of Algiers* painted three years later. In 1839 another panorama painting, this time of the burning of Moscow in 1812, was opened in a specially constructed building on the Champs-Elysée in Paris.

In 1855 and 1856 Langlois made two journeys to the Crimea to record the scenes there. Working with both Méhédin and Martens, he produced a fine series of photographs, now in the Bibliotheque Nationale, sketches for a huge panorama of the siege of Sevastopol painted from inside the Malakoff Fort. The resulting painting was his first to be based on photographic sketches. It was exhibited in Paris in 1860.

JOHN HANNAVY

LANTERN SLIDES

The magic lantern, the projector which delivered thousands of Victorian slide shows, and which enjoyed renewed popularity with the introduction of the photographic lantern slide, can trace its lineage back, at least, to the middle of the seventeenth century. Some historians place the genesis of the lantern much earlier.

Before 1850, the magic lantern was used to project hand drawn and hand-painted slides as public entertainment, with narrative sequence being created by artists, and some movement being introduced by elaborate optical-mechanical features.

The introduction of the hyalotype, or photographic lantern slide, by Frederick and William Langenheim after 1850, revolutionized magic lantern shows, and creating a huge new market for photographers and photographic publishers.

The lantern slide, as introduced by the Langenheims, gave a new lease of life to the slow but very fine grain albumen-on-glass process which had been introduced a few years earlier, and not very successfully, by Felix Abel Niepce de St Victor. While its low sensitivity made it impractical as a negative medium for all but still life work, or landscape and architecture on the stillest of days, as a printing medium it proved ideal.

Using a camera obscura in reverse, large negative images could be reduced and printed on to the small glass plate for projection in the lantern. The fine grain structure of albumen-on-glass was ideal for this purpose, retaining the finest of detail—essential when the image was subsequently projected on to a large screen.

While it is clear that the Langenheims initially saw the lantern slide as an extension of the entertainment business—they charged admission to their slide shows—it proved to be of much great importance in the second half of the nineteenth century.

With series of slides covering travel, architecture, landscape, exploration, history, biblical themes, and many other subjects, the magic lantern swiftly moved from being an entertainment to being a powerful educational and instructional tool.

Lantern slides, before the advent of photography, came in a variety of sizes. "French Pattern" slides were 3.25" × 4", while "English Pattern" used a square 3.5" × 3.5" format. The European standard size was slightly smaller at 3.25" × 3.25", and it was this format which became the standard for photographic images, although the 3.5" × 4" format endured in France, America, and Japan.

Color, introduced by hand-painting over the photograph, was used for some images, but toning was more usual as, in addition to offering a variety in coloration, it also helped protect the image against premature fading under the intensity of the lantern's illumination.

While today the idea of the projected image is com-

monplace, the novelty of the large projected photographic image in pre-cinema days was considerable, and the popularity of such displays grew exponentially.

While travel themes were probably the most popular—educating an audience about the treasures of places they would never visit—the magic lantern show covered a wide range of subjects. Themes and ideas which had previously been projected using painted slides were given added realism when photographic imagery was used. Thus biblical lantern shows proliferated—the photographic "evidence" of places mentioned in the Bible being used to add authenticity to the stories thus delivered.

Many of the leading travel, architectural and landscape photographers of the second half of the nineteenth century offered their images in lantern slide format as well as traditional paper prints and stereographs. Thus the Langenheim brothers published series of views of their adopted home, Philadelphia, and, wider afield in America.

Edweard Muybridge, a consummate showman, lectured widely throughout the 1870s, 1880s, and 1890s using lantern slides of his landscape and architectural views to delight audiences. When lecturing about his ground-breaking photographic experiments in animal locomotion, in addition to using hyalograph discs in his zoopraxiscope to recreate motion, he illustrated his lectures with selections from several thousand lantern slides of single images. A vast collection of these lantern slides is preserved in Kingston Museum, England.

Aberdeen photographer George Washington Wilson's series on Windsor Castle and the River Thames could be purchased in slide format, as could his delightful 1880s series of view of life on the remote Scottish island of St. Kilda.

The photographs taken by Charles Piazzi Smyth for his *Three Cities in Russia* (1862), best known in two-volume book form, were also available as a series of warm-toned and tinted lantern slides, and lantern slide sets exist of his views of the pyramids of Giza.

The negatives for many subject photographed for the stereoscope could be reprinted as lantern slides and, trimmed down, as *cartes-de-visite* as well, considerably increasing the sales potential of a single negative.

Several manufacturers of magic lanterns offered extensive catalogues of photographic slides to their customers. Amongst these, York and Company of London, and McAllister & Brother in Philadelphia were major players. By the late 1850s, McAllisters had a large photographic department marketing slides of photographs by numerous photographers. As the majority of lanterns they sold by the 1880s were imported from Europe, especially Britain, it can be assumed that their image catalogue contained both the European and American sizes of slides.

The growth of the photographic lantern slide as an education tool has been credited with revolutionising a number of academic disciplines, most notably the sciences and the history of art. Universities throughout the world had, by the end of the century, extensive libraries of lantern slides, and continued to use them until the lantern slide was replaced by the film transparency after the Second World War.

Lantern slides as entertainment developed as a separate but equally important entity, with companies creating elaborate tableaux exploring moral and social issues such as the evils of drink, and producing narrative sets of slides to illustrate their themes—just as they had with stereocards in the 1860s and 1870s.

One such company, Bamforth & Company of Holmfirth, Yorkshire, picked up the "story-telling" idea which had been so successfully exploited in the 1860s and 1870s by the London Stereoscopic Company, and marketed series with resonant titles such as "The Curse of Drink," "The Drink Fiend," "The Road to Heaven," "Strike While the Iron is Hot," and "Deep in the Mine." It was a logical step for Bamforths to progress from the still picture sequence to the moving image, and become, for a view years, pioneers in early cinema.

JOHN HANNAVY

See also: Langenheim, Friedrich and Wilhelm; Niépce de Saint-Victor, Claude Félix Abel; Wilson, George Washington; Piazzi Smyth, Charles; and Muybridge, Eadweard James.

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LAROCHE, MARTIN (WILLIAM HENRY SILVESTER) (1814–1886)

A jeweller turned photographer, Martin Laroche is primarily remembered for the important court case *Talbot v Laroche* in 1854, in which Talbot attempted to claim that the 'new process' of collodion was covered by his 1841 British Patent No.8842.

Talbot had relinquished his patent rights over amateur photographers in 1852, the year after collodion was introduced, but had sought to retain control over the use of negative materials from which positive prints were made for professional portraiture. A situation existed whereby professionals had to pay a licence fee to Talbot to use a process given freely to them by Frederick Scott Archer.

Laroche opened a studio at 65 Oxford Street, London, before 1848—under the name 'Silvester Laroche'—initially making daguerreotypes, examples of which were shown at the Great Exhibition in 1851. He later used the wet collodion process. The studio continued to operate until at least 1862.

In the 1854 court case, Talbot was represented by, amongst others, the eminent scientist William Grove FRS, while Laroche's solicitor was Peter Wickens Fry who had worked with Archer in the development of the collodion method. The verdict confirmed Talbot's pre-eminence as the inventor of negative/positive photography, but also confirmed that collodion was not covered by his patents.

JOHN HANNAVY

LATENT IMAGE

A latent image can be most simply defined as a hidden or invisible image formed by brief exposure to light, which can be revealed to the naked eyed only by the chemical action of a developing agent.

The first steps towards the concept of a photographic latent image are often traced back to W.H.F. Talbot's work in September 1840 that led to the introduction of his Calotype process. However, there can be little doubt that L.J.M. Daguerre, albeit imperfectly, recognised the presence of some invisible pre-image state initiated by light, perhaps as early as 1837. His daguerreotype process required the use of a silvered copper plate made light sensitive by exposure to iodine vapour. Little or no visible image was produced after several minutes of exposure in the camera, but it was found that a distinct image appeared after treatment (development) with heated mercury vapour. Daguerre is reputed to have discovered his developing agent purely by accident when he left a collection of old plates in a cupboard containing an uncovered basin filled with liquid mercury. The term "latent image" was certainly used in 1839 in connection with the daguerreotype process. An account of the official report of Daguerre's technique published in *Le Constitutionnel*, 21 August 1839 states; "After 4 to 10 minutes, according to the period of the day, according to the season, and to the intensity of light, the image of immobile objects from which the lens receives the light, becomes perfectly imprinted on the plate, although this image is yet invisible and only latent ["seulement latente"]…. But this image, that is yet, so to say, in a state of an unformed chrysalis, what consequently comes to reveal it out of its swaddling clothes? It is the vapour of mercury, from mercury heated to 60 Reaumur."

Talbot's concept of the latent image has been more widely recognized, perhaps because of his use of techniques closer to modern practice. The story is well documented. In his original process announced in1839, photogenic drawing, paper coated with silver halide salts was exposed in a camera until an image appeared. The process was very slow. Many minutes, even hours, were required to produce a satisfactory picture. In the late summer of 1840 he recommenced some earlier experiments he had begun using gallic acid. His notebook of September 21 refers to "an exciting liquid" a mixture of silver nitrate, acetic acid and gallic acid. His entry of September 23 records "The same exciting liquid was diluted with an equal bulk of water, and some very remarkable effects were obtained. Half a minute suffices for the Camera the paper when removed is often blank but when kept in the dark the picture begins to appear *spontaneously,* and keeps improving for several minutes. . . ." On the same page in the context of reviving what he called old or faded pictures, he refers to a "kind of *latent* picture…." Talbot had discovered the latent image, which could be revealed using a developer, in his case, gallic acid. He later wrote in a letter to the *Literary Gazette*, 19 February, 1841, "I know few things in the range of science more surprising than the gradual appearance of the picture on a blank sheet, especially the first time the experiment is witnessed."

The mechanism of latent image formation intrigued and baffled the pioneers and continued to be the subject of speculation and dispute throughout the nineteenth century. According to the popular 1850s guide, *A Manual of Photographic Chemistry*, by T. Frederick Hardwich (third edition, 1856), "the ray of light determines a *molecular* change of some kind in the particles of Iodide of Silver forming the sensitive surface." The American authority, M.Carey Lea, offered a different explanation. In *The Photographic News*, (11 August 1865) he claimed "…the production of a developable image in the camera upon an iodo-bromised film is a purely physical phenomenon, that no decomposition of the silver salts takes place, no separation of iodine. By the end of the nineteenth century, most latent image formation theorists were sharply divided in favour of one or the other of the two approaches cited above, the chemical or the physical. The former group suggested the formation of an unknown sub halide salt while those favouring the latter argued that the action of light caused some change in the physical character of the silver salts. It was not until photography became a giant industry supported by systematic scientific research facilities in the 20th century that the mysteries of latent image formation began to be unravelled.

Modern scientific explanations are based on the *concentration speck theory* of R.S. Sheppard and colleagues working at the Kodak Research Laboratories in the 1920s and the mechanism proposed in 1938 by Professors R.W. Gurney and N.F. Mott based at Bristol University. The detailed theories are complex and the supporting experimental evidence requires an

understanding of the nature of ionic mobility, crystal structures and quantum theory. Only a much-simplified explanation is, therefore, possible.

Since the end of the 19th century, most photographic films, plates and papers have been coated with a gelatin emulsion in which are suspended crystals of light sensitive silver halides (chlorides, bromides, and iodides). A brief exposure of light is believed to act on some silver halide crystals in a way that produces an aggregate of metallic silver atoms. This aggregate is the latent image, the invisible building blocks from which the visible image is formed. The number of silver atoms involved may be very small but they render the silver halide crystals susceptible to the action of an appropriate chemical solution, (developer), which when applied causes the invisible aggregate to change and grow into a visible image of black metallic silver. Although understanding of the latent image has greatly progressed since the 19th century, its mechanism remains based on theory and subject to modification and revision. Even with the best modern technology, it remains impossible to detect a latent image by direct physical or chemical means.

JOHN WARD

See also: Talbot, William Henry Fox; Daguerre, Louis-Jacques-Mandé; Calotype and Talbotype; Daguerreotype; and Photogenic Drawing Negative.

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LAURENT, JUAN AND COMPANY (1816–before 1892)

Born Jean Laurent in Garchizy, France, in 1816, he moved to Madrid in 1843, where he reportedly registered himself as "Juan" (the Spanish style of "Jean"), and established and operated a successful company manufacturing cardboard packaging. His photographs however, where they are identified, simply bear the legend "J. Laurent" or "J. Laurent y Cia."

His earliest recorded encounter with photography dates from 1856, with the establishment of a studio at Carrera de San Jerónimo in Madrid. Although he lived in Spain for the remainder of his life, he never lost contact with his French roots and, at the height of his success, Laurent opened a gallery in Paris selling prints from his finest Spanish and Portugese architectural and landscape scenes, copies of great paintings, art and architectural treasures. Like the Englishman Charles Clifford, he photographed and sold images of Spain's rush towards the modernisation of its capital city, and the building programmes which dominated the 1860s.

Again like Charles Clifford, he went on to develop a reputation as one of the finest photographers in the city, enjoying, also like Clifford, the patronage of Queen Isabella II. Indeed, for most of the 1860s, he styled himself "Photographer of Her Majesty the Queen."

Laurent's large format camera work is technically more precise than Charles Clifford's—with great attention to details of architectural accuracy—but like Clifford, his love of the Spanish light, architecture, and scenery is apparent. In some of his architectural studies, careful choice of camera position, ideal lighting, and technical excellence combine to produce images which revel in simple geometric patterns, a direct and graphic style which others would adopt only very much later. *Puente de Zura* (Collection of the Metropolitan Museum of Art) dating from c. 1867, is a fine example of this approach.

In 1867 the studio exhibited a number of large *Álbumes de Obras Públicas* at the Exposition Universalle in París, and the production of large albums of views would remain a signature activity for the studio.

Laurent reportedly employed several photographers to create the images for these albums and catalogues, as well as a large number of support staff. One of the photographers was José Martínez-Sánchez who worked with Laurent for many years, and is believed to be responsible for a significant proportion of the studio's considerable output.

In 1866, in collaboration with Martínez-Sánchez, Laurent perfected 'Leptographic' paper ('Leptofotografía'), a collodio-chloride printing paper which was sold ready to use. The light sensitive silver chloride was held in a binding layer of cellulose nitrate, separated from the paper by a layer of barium sulphate (later known as baryta), giving a much whiter base colour to prints than had been previously possible with albumen paper. The baryta layer acted as a barrier, eliminating the spotting from rusting metal particles in the paper which sometimes happened with albumen papers, and at a stroke, the introduction of this paper removed from the photographer all the paraphernalia of having to sensitize the paper before use, as had been needed with albumen. As the manufacturers claimed, it had three times the sensitivity of albumen, and exposure times for contact printing could also be reduced significantly. In the same

year, the Leptographic Company opened a branch in Paris, reported by Marc-Antoine Gaudin in *la Lumière*, August 30, 1866, and offered samples of the new paper to members of the *Société française de photographie* for them to experiment with. For a variety of reasons, it would be a further fifteen years before commercial-scale production of collodio-chloride papers became successful—and in Germany rather than France or Spain.

It is apposite, and perhaps significant, to observe that the majority of the surviving examples of Laurent's work are printed on albumen paper rather than his own invention.

A member of the *Société française de photographie* since 1859, and a regular exhibitor in Paris where his prints and albums found a ready and wealthy clientele, Laurent exhibited only once in London, at the 1858 exhibition of the Photographic Society.

Architectural views of Granada, Toledo, Segovia, Seville, and elsewhere all attest to the quality of his output. And by the mid 1860s, as Laurent y Cia, he was the proprietor of the largest photographic publishing house in Spain, with a growing reputation—and demand for his work—wider afield.

In the 1860s alone, the company produced over twenty catalogues listing their huge archive of images.

His 1866 album of 164 photographs from the collection of the Prado Museum in Madrid, marketed through his own gallery in Paris, was distributed for the British market by Marion & Co. of London.

Laurent y Cia had the exclusive photographic franchise within the Prado from the late 1870s until his death, and produced a huge catalogue of images of the masterpieces contained within the museum. An exceptional panorama, dating from 1882–83 and showing the museum's central gallery, survives in the Prado's own collection of Laurent's work.

Another album depicted the treasures of the Madrid Armoury, and as one of the images is titled, in the negative, *Armeria de Madrid. 337. Trophée formé de diverses armes, oeuvres de Mr. E. de Zuloaga. J. Laurent Madrid*, we can recognize that the published album contained only a very small proportion of the images he had produced.

Uncertainty surrounds the exact date of Laurent's death; certainly no later than 1892, some historians have offered a date as early as 1883, with others suggesting the late 1880s or 1890. The studio was apparently owned, or at least operated, by his step-daughter Catalina and her husband Alfonso Roswag after 1883. Roswag had been employed some years earlier as one of Laurent's team of photographers, and the studio of Laurent y Cia remained in their hands until Alfredo's death in 1899.

JOHN HANNAVY

See also: Clifford, Charles; and Spain.

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LE BLONDEL, ALPHONSE (1814–1875)

Alphonse-Bon Le Blondel, also Leblondel, (both spellings existed until 1862)—was born in Normandy on April 19, 1814. He first trained as a painter but soon turned to photography along with two of his brothers—Alexandre and Théodore (both born in 1822). He learnt the trade in 1840–1841, most probably among a circle of daguerreotypists prevalent in Paris's Palais Royal where he used to sell photographic equipment.

As early as 1842 he made various forays as an itinerant photographer with Alexandre into the North of France (Lille, Douai, Arras), thus playing an important role in the circulation of daguerreotypes among the general public. In 1845 he founded one of the first professional studios in Lille. He rapidly caught the attention of Lille's notables by his exemplary technical expertise and an aggressive commercial strategy (cheaper prices, advertisement in the local press, and exhibitions in shops). Indeed, he managed to compel recognition for 10 years as he found no serious competitor in Lille.

From 1855, the development of the "Le Blondel Brothers" studio, of which Théodore was now a partner, expanded both on a commercial level as well as in terms of recognition among professional photographers. His success and profitability enabled him to persue his trade until 1892.

Le Blondel was one of the first professional daguerreotypists. He also experimented with paper photography as early as 1845 and marketed so-called 'advanced' calotypes at the beginning of September 1846. When studying Lille, one cannot forget to mention Louis-Désiré Blanquart-Évrard who communicated the first results of his research work on the improvement of calotypes to the Academy of Science in Paris on September 28, 1846, the very process being unveiled in

Le Blondel, Alphonse Bon. Postmortem. *The Metropolitan Museum of Art, Gilman Collection, Purchase, The Horace W. Goldsmith Foundatoin Gift, 2005 (2005.100.31) Image © The Metropolitan Museum of Art.*

January 1847. Despite a few allegations, no connection between the two characters can be traced as they had quite different ambitions.

Le Blondel was attentive to the technical development and ingenious improvements of the already-existing processes. Therefore, he managed to conserve his local pre-eminence by providing constantly renewed services. In 1853 he adopted the process of collodion glass-plate photography, which he used with remarkable expertise in his urban views. He also worked on ambrotypes (1854), stereoscopic photography (1859), photographic enamels (1872) and specialized in enlargements (1874). Last of all, not long before his death, the studio turned to aristotypes and snapshots, showing an interest in the new permanent printing processes—lambertypes, 'encre-grasse' printing and carbon photography. Over the course of his career, Le Blondel had tackled many photographic genres: portrait in all its forms, studies, genre scenes, topographic, and architectural views.

In the second half of nineteenth century, town planning was deeply transformed. Four cities, among the most important Paris, Lyons, Marseilles, and Lille, hired photographers to bear witness to that upheaval—Marville in Paris, Terris in Marseilles, Froissart in Lyons, and Le Blondel in Lille.

In 1870, he was commissioned by the city of Lille to capture shots of the building of Rue de la Gare. The death of their founder in 1875 did not prevent the studio from carrying on with this task and they continued to take part in professional shows. The critic Ernest Lacan admires their 'beautiful reproductions of historical monuments' at the photographic show of Le Havre in 1877. In 1878, under Théodore's management, Le Blondel's studio carried out a prestigious order from the city of Lille for Paris's World Fair: an album entitled "*Photographic Views of the Major Works Made in the Enlarged City from 1860 to 1878"* displays an outstanding survey of Lille's transformation in forty-three large-sized albumen prints: the building of thoroughfares, administrative edifices, schools, hospitals, religious buildings, industries, shops, public gardens, and stately gates. In 1882, the studio was to fulfill an important order from the city of Roubaix to take shots of the recently-built school buildings.

From 1842 onwards Le Blondel regularly displayed his works in the best-known downtown shops in order to keep his fame alive. True recognition however, came from the capital's professional photographers. In 1853 he exhibited framed portraits in Dunkirk. In 1854 he sent daguerreotypes and paper prints to Paris's newspaper *Le Propagateur,* which were then highly praised. He was awarded medals and distinctions as appreciation for his participation in Paris's World Fairs (1855, 1867, and 1878), in the shows organized by the French Society of Photography (1857, 1859, and 1861), in Le Havre's exhibition (1877), in Brussels and Courtrai's international exhibitions (1856, 1857, and 1865). Le Blondel thus gained recognition from critics (Ernest Lacan in the reviews called *La Lumière* and *Le Moniteur de la photographie*, Paul Périer in *Bulletin de la SFP*).

The technical and aesthetic quality of his work particularly asserted itself in the urban views on albumen paper. In these works, horizontal centring was favoured over wide foregrounds, which caught the subject either frontally or obliquely. Sobriety in lines,

subtlety in light and fineness in details characterize his photographs.

Le Blondel's photographs make up a rich and consistent collection of about 700 original works visible in private and public places in France and abroad. The majority can be found in Lille and the North of France with 650 "vintage" works (423 paper prints and negatives, 227 glass plates of 36cm x 26cm size). The most significant collection is that of Lille's public library, which owns 180 salt-paper and albumen prints such as portraits as well as varied views. Most importantly, the collection contains three big albums with views of Lille containing about a hundred albumen original prints—the album made for 1878's World Fair being one of these. The North's Historical Committee is in possession of the glass-plate negatives for these albums, which are now kept in the North's Record Office. The rest is divided between various institutions in Lille (Museums, Diocesan Archives) and Roubaix's public library which holds two albums dating from 1882 (64 print papers). In Paris, the Bibliothèque Nationale and Orsay Museum own a few daguerreotypes and about forty print papers.

So, as to retrace the studio's history; Lille's public Library displayed 170 photographs in Lille's Palace of Fine Arts from September 16th to December 18th 2005 in an exhibition called "Le Blondel—A Photographic View of Lille in the 19th Century," which led to the publication of a scientific catalogue.

ISABELLE DUQUENNE

Biography

Alphonse-Bon Le Blondel was born into a six-child family of clockmakers on April 19, 1814, in Bréhal, a small town in Normandy near Granville. After training as a painter, he learnt photography with Paris's daguerreotypists from 1840–1841. In 1842 he worked as an itinerant photographer in the North of France before he founded one of Lille's first professional studios at twenty-five, Rue de Paris in 1845. From 1855 he developed 'Le Blondel Brothers' company which lasted until 1892. In 1859 the studio grew larger and moved to 1, Pont de Roubaix/Rue du Cirque. With the help of his wife Angélique-Aimée Daviette (1800–1871), a fellow photographer, two branches were successively opened in Lille in 1866 and 1869. Being an excellent portraitist, Le Blondel compelled recognition as a specialist of urban views. He produced a topographical series of Lille and its great transformations in the 1870's.

He died in Lille on May 12, 1875.

Exhibitions

1853, Dunkirk, Magasin de la Marine (F)
1855, World Fair, Paris (F)
1856, Brussels (B)
1857, French Society of Photography, Paris (F)
1857, 4th Industrial Arts Exhibition, Brussels (B)
1859, French Society of Photography, Paris (F)
1861, French Society of Photography, Paris (F)
1865, Courtrai (B)
1867, World Fair, Paris (F)
1877, Le Havre (F)
1878, World Fair, Paris (F)

See also: Daguerreotype; Calotype and Talbotype; Blanquart-Évrard, Louis-Désiré; Lacan, Ernest; and Bibliothèque Nationale.

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LE GRAY, GUSTAVE (1820–1882)

French photographer, artist, inventor, and writer

Like many early photographers, Gustave Le Gray's artistic background was in painting, a fact that, as with his contemporaries, influenced his direction, his vision and the composition of his finest photographs. A student in the Paris ateliers of François-Edouard Picot and Paul Delaroche in the early 1840s, surprisingly only one example of his accomplishment in drawing or painting has so far been identified—a photographic copy dated 1854 of a drawn portrait of the painter Bénédict Masson. This absence of surviving work is despite Le Gray having set himself up as a working painter in Paris before 1847—the year in which he took up the new art of photography—and records up to 1848 which describe his contributions to various exhibitions in the city. He continued to advertise his services as a painter of miniatures well into the 1850s, by which time he was already acknowledged as an authority on photography.

Le Gray became aware of photography in the mid-1840s, and was immediately intrigued by it. By his own recollection, his first engagement with the medium was with the daguerreotype, probably under the guidance of François Arago, and by 1847–48 he was sitting for the camera of Henri le Secq, who was experimenting with a post-waxed paper negative process, probably based on Fox Talbot's calotype. Le Secq's studies of him, casually dressed and posed as the young artist, have a vitality and a confidence which were already becoming characteristics of early French photography. It is likely that Le Gray had met Le Secq and Charles Nègre while studying in Delaroche's studio.

The enthusiasm with which Le Gray embraced the art of photography, and his early grasp of its chemical intricacies, can be gauged by the fact that within a year

Le Gray, Gustave. Brig on the Water.
The Metropolitan Museum of Art, Gift of A. Hyatt Mayor, 1976 (1976.645.1) Image © The Metropolitan Museum of Art.

he was teaching others. A notable student—who took lessons from him in 1849—was Maxime du Camp, probably the first European photographer to travel extensively in Egypt with a camera in 1850.

Le Gray's work appeared in France's first photographic exhibition—within the *Produit de l'Industrie* exhibition in 1849—and those early images, taken in the Forest of Fontainebleu, won him a bronze medal at the exhibition. Nine images submitted to the Paris Salon in the following year were hung in the Graphic Arts section amongst the work of lithographers, but were quickly removed and returned to the artist, apparently being inadmissible.

Le Gray's confidence with the technology and chemistry of early photography manifested itself in a series of treatises, the first of which—*Traité Pratique de Photographie Sur Papier et Sur Verre*,—was published by Germer Ballière in Paris in June 1850. He was, by this time, an ardent promoter of paper negative processes and in that publication wrote

> The future and extensive application of photography will doubtless be confined to the paper process and I cannot too much engage the amateur to direct his attention and study to it. (from the English translation, "A Practical Treatise on Photography upon Paper and Glass" translated by M Cousens, London: T&R Willats, 1850)

Despite his advocacy of paper-based photography, that same treatise offers an intriguing glimpse of Le Gray's enthusiasm for experimentation with a range of processes. In addition to his description of a range of paper processes, he noted in an appendix that "I am now making use of the following process on glass: Fluoride of Potassium or Sodium is dissolved in alcohol of 40° mixed with sulphuric ether and then saturated with collodion," a tantalising suggestion that he was using a wet collodion process before Frederick Scott Archer published his account thereof. Writing in *Plain Directions for Obtaining Photographic Pictures Upon Glass and Albumenised Paper* (Richard Willats, London 1853) Charles Heisch noted that this was undoubtedly the first published account of the method, although such a process had been predicted as early as 1847. Needless to say, Archer dismissed the Frenchman's claim because "he did not give the public the advantage of following him and that in his work of 1850 the subject is dismissed in three or four lines (Heisch quoting Archer, 1853).

Le Gray's acknowledged contribution to the emerging science of photography was not his prediction of wet collodion, however, but his widely practised *papier ciré*—the Waxed Paper Process, the first photographic negative material with a surface-coated light sensitive layer on a flexible support—announced in 1851 and arguably prefacing the materials which would dominate photography throughout the twentieth century. While Le Gray's original formulation was ideally suited to conditions in France, it had to be customised by others—including Roger Fenton, William Crookes and Dr.

Thomas Keith in Britain—to suit different qualities and intensities of light. In its various formulations it became a high-quality and user-friendly process ideally suited to travelling photographers and to amateurs. Pre-waxing the paper restricted the light sensitive chemistry to the paper surfaces, and removed the tendency for a photographic image of the paper fibres to be created in addition to the image of the subject. In its original form, with the waxed paper immersed in the silver bath, a light-sensitive coating was created on both faces of the paper. Later refinements included floating the paper on the sensitising solution, thus restricting the image-bearing layer to a single surface.

From the point of the travelling photographer, waxed paper negatives could, if required, be prepared several days before exposure, and developed several days afterwards. Thus freed from the constraints of transporting a darkroom wherever they went, photographers could concentrate solely on the image.

Le Gray demonstrated the versatility of his process in a remarkable series of landscapes taken between 1849 and 1852 in the densely wooded Forest of Fontainebleau. His understanding of the relationship between the light and the limited spectral sensitivity of his dry waxed paper negatives is manifest in these images, creating in his salt prints an intimacy which at once both draws the viewer into the composition and evokes a strong emotional relationship with the environment. By careful choice of both lighting and location, his images went far beyond simple representation, denoting a clear understanding of the potential of his process, and the unique vision of the camera.

The forest was a subject to which he returned in his later engagement with collodion, further developing his personal relationship with the place.

In parallel with his continuing exploration of Fontainebleau, Le Gray applied his talents and his process to a unique undertaking on behalf of the Commission des Monuments Historiques, an agency of the French government. Recognising the importance of photography as a tool of record, the Comte de Laborde, a curator at the Louvre working on behalf of the Commission, approached a number of founder members of the Société Héliographique in Paris in 1851 to undertake a nationwide photographic survey of historic buildings, many of which were deemed to be under threat. Laborde had long been enthusiastic in his advocacy of photography.

First to be thus commissioned was Edouard Baldus—ironically to photograph buildings around Fontainebleau, an area Le Gray knew so well. Further commissions went to Henri le Secq, and to Hippolyte Bayard, who had contributed his own unique process to the emerging development of photography.

Some months later, Gustave le Gray's name was added to the list, with commissions to photography buildings in and around the Loire valley, Orléans, and as far south as Carcassonne.

All the photographers commissioned were conversant with a range of paper negative processes, and all but Bayard used variants on the calotype or the waxed paper process to produce their images. Bayard is believed to have used albumen on glass, the process pioneered in the late 1840s by Claude Félix Abel Niépce de Saint. Victor. While about three hundred paper negatives are archived in the Musée d'Orsay in Paris, none of Bayard's glass plates is known to have survived.

Le Gray received his commission at the same time as Olivier Mestral, and the two men appear to have pooled their lists and elected to work together. The French journal *La Lumière* reported that "Accompanied by M. Mestral, M. Le Gray is working in the region of the Midi beyond the Loire towards the Mediterranean: he has not yet returned but has sent precious dispatches." While this clearly implies that negatives had been sent back to Paris, the question remains unanswered as to whether or not they were processed in the field, or sent back undeveloped.

Many of the images they created show all the hallmarks of Le Gray's mastery of light and shade. Details of buildings are revealed in bright pools of sunlight, while other areas are allowed to recede into deep shadows. They are however overshadowed by his architectural studies of Paris in the later 1850s, and of Italy and Egypt in the early 1860s.

Just what the Commission initially planned to do with these images is not clear, but in the event it did little except secure their survival. They were not published, and indeed relatively few were even printed. But as many of the buildings photographed were subsequently subjected to ill-informed "restorations" in the years that followed, these images have today acquired an historical importance far beyond any original intentions the Commission might have harboured.

Concurrent with these major undertaking with waxed paper, Le Gray had, according to N. P. Lerebours in *La Lumière* in 1852, also been working with the wet collodion process since 1850. He had also been working with albumen on glass, and Philip Delamotte exhibited two such images amongst five Le Gray titles at Great Britain's first photographic exhibition at the Royal Society of Arts, London in December 1852. Waxed paper, however, still remained his principal and preferred medium well into 1854, at which time it still featured strongly in the fourth edition of his treatise on photography.

Later in 1854, he became one of the founder members of the Société Française de Photographie, and a member of its management committee.

Whilst the dating of many of Le Gray's extant images is problematic, there is scant evidence of his continuing

employment of either waxed paper or albumen on glass into 1855. All his subsequent imagery was produced using collodion on glass.

With collodion, he returned to Fontainebleau and revisited his earlier works on the forest, exploiting the greater sensitivity of the glass plate but still exploring the pools of light which penetrated deep into the woodland. In printing some of these later images he also carried out experiments in combination printing, combining negatives of the forest walks—exposed correctly for the foliage—with separately exposed negatives of sky and cloud. This technique was also exploited in his series of seascapes from 1855, which heightened his profile considerably in the world of French photography.

Le Gray's seascapes are remarkable for a number of reasons, not least of which is the impact they had when first exhibited. They were striking and powerful, taking landscape and pictorial photography to new levels of sophistication both in design and execution. They were also phenomenally popular, selling in very large numbers—with contemporary advertisements claiming sales of over eight hundred prints.

Very little is known of the techniques used in their production, and they represent both a significant leap forward for photography and change of direction for Le Gray. Researchers have determined that they fall into two categories—those which are genuine single instantaneous exposures capturing sea and sky at the same time (but perhaps manipulated in processing and/or printing) and those which are the result of careful and controlled combination printing.

Whilst they met with significant public acclaim, their reception in the photographic press was mixed—several reviews citing the 'unnatural' relationship between cloud and sea. Dark and often overpowering skies, shot directly into the sun, give a moonlight effect to some, and a sense of an approaching storm in others. One British reviewer complained that they did not conform to contemporary expectations that photography would reflect truth in nature

> Measured by the photometer, a cloud, according to the illumination, is from a thousand to a million times more luminous than a terrestrial body. In this picture we doubt if in any part of it a greater contrast could be found than in the proportion of 1 to 30. (William Crookes, editor of The Liverpool & Manchester Photographic Journal 1:6, 15 March 1857.)

Photography's great dichotomy has always been the distance between artistic interpretation and truthful representation. While many of Le Gray's architectural studies do conform to the expectations of those who saw photography's role as being truthful to nature, the images which form his major contribution to photography's history are now rightly recognised as art.

In 1856 Le Gray moved from his studio in Chemin de Ronde de la Barrière de Clichy in Paris, to new premises in the Boulevard de Capucines, premises already partly occupied by the Bisson Frères, and later by the charismatic Nadar (Gaspard-Félix Tournachon).

Given the high profile of Le Gray's architectural, landscape and seascape photography today, it would be easy, but inappropriate, to categorise him simply as a photographer of the outdoors. His interest in portraiture predates his engagement with photography, and the photography of people was a consistent feature of much of his professional life, particularly the period between 1854–55 and his departure from Paris in the early months of 1860.

Fine studio portraits survive of the French Emperor and Empress, and of leading figures from both military and civilian life. A small number of nude studies, photographed on waxed paper, survive from the early 1850s.

In the summer of 1857, Le Gray was commissioned by the French Court to photograph an innovative military development—the creation of a special camp for the Imperial Guard at Châlon sur Marne, presided over by the Emperor and Empress themselves. The series of photographs which resulted from that commission—panoramas, military portraits and theatrically-staged tableaux, have, in their conception and execution, much in common with Roger Fenton's depiction of the war in the Crimea two years earlier. Given that the Imperial Guard had Zouave divisions—as did the British army in the Crimea, there are obvious similarities in some of the group tableaux. Despite the advances made with the wet collodion process since Fenton's commission, the large format of Le Gray's plates, and the cumbersome nature of his camera, clearly imposed limitations on any aspirations he may have had about capturing the bustle and spontaneity of the proceedings.

It is ironic, considering the importance of Le Gray's oeuvre, that by 1859 he was apparently facing financial ruin. Early in the following year, *Le Gray et Cie* ceased trading, and the photographer himself left France and his family for good. He set sail with Alexander Dumas on a Mediterranean journey which took them into the midst of Garibaldi's struggle in Italy—resulting in a remarkable series of images by Le Gray of battle-damaged buildings in Palermo and elsewhere. There is strong evidence that for part of this voyage at least, he reverted to his original preference for waxed paper—sacrificing the enhanced detail of the glass plate, for the advantages of travelling light and preparing and processing at leisure.

Le Gray parted company with Dumas in Malta, and made his way to Lebanon and Egypt, again photographing extensively wherever he went, and again using large waxed paper negatives. He remained in Egypt for the

remainder of his life, living at times in Alexandria and in Cairo.

He became a tutor in drawing and painting, and the last recorded reference to him working in photography is dated 1869. After that time, he slipped off the European photographic stage into relatively obscurity, although well respected in Cairo. He is believed to have died there in 1882.

JOHN HANNAVY

Biography

Jean Baptiste Gustave Le Gray, or Legray as he sometimes styled it, was born on August 20, 1820, the son of Jean Martin Legray and Catherine Gay, at Villiers-le-Bel, France. From about 1839 until 1843, he studied drawing and painting in Paris, before travelling to Switzerland and Italy where he met and married Palmyra Leonardi in 1844. Their first daughter, Elvira born in 1845, lived less than a year, and her name was given to their second born the following year. She died before she was three years of age, probably a victim of cholera. A further daughter and a son were born in the mid 1850s, but by 1865 only one child was apparently still alive, living with Le Gray's estranged and near-destitute wife in Marseilles. In that year, he travelled to Rome to meet with his wife, in the hope that his financial difficulties in France might permit a return, but it was not to be. Hopeful of returning to France to resume his photographic career, he had retained his membership of the Société Française de la Photographie until at least 1863.

Le Gray's death—in Egypt in 1882—was reported by Nadar, but no formal confirmation of the date has yet been discovered. Nadar reported that Le Gray suffered a broken arm after a riding accident, and that "il mourut vers 1882 dans une détresse assurément imméritée."

See also: Delaroche, Paul; Le Secq, Henri (Jean-Louis Henri Le Secq des Tournelles); Arago, François Jean Dominique; Talbot, William Henry Fox ; Calotype and Talbotype; Collodion; Waxed Paper Negative Processes; Société Héliographique; Baldus, Édouard; Bayard, Hippolyte; Niépce de Saint-Victor, Claude Félix Abel; Nadar (Gaspard-Félix Tournachon); and Bisson, Louis-Auguste and Auguste-Rosalie.

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LE PRINCE, LOUIS AIMÉ AUGUSTIN (1841–c. 1890)

Son of a major in the French artillery, young Le Prince's interest in photography was perhaps spurred by a family friend, L.J.M. Daguerre. A surviving daguerreotype shows him as a young boy, with his parents and brother. After college at Bourges and Paris, Le Prince did postgraduate work in chemistry at Leipzig, Germany. He studied art, and specialised in the painting and firing of art pottery. Invited to Leeds, England, by old school friend John R Whitley, he stayed and joined the firm of Whitley brothers, brass founders, and in 1869 married Miss Lizzie Whitley, who had trained at the famous French pottery at Sevres. During the Franco-Pussian war he survived the Seige of Paris as an officer of volunteers, and on his return to England the Le Princes set up a school of applied art in Park Square, Leeds.

Le Prince carried out photography on metal and pottery, and his portraits of Queen Victoria and Prime Minister Gladstone were placed in the foundation stone of Cleopatra's Needle in London.

In 1888 Le Prince went to the United States on a business venture but this failed. He became manager of a group of artists who made large circular panoramas in New York, Washington, and Chicago. A 10th-scale mock-up sketch of the scene was "squared up" and each square photographed. Lantern slides of the drawings were then projected onto the huge panoramic canvases as a painting guide. These giant vistas were visually impressive but the action scenes they depicted lacked movement, which may have given Le Prince the idea for developing moving "panoramic views." Soon afterwards he started experimental work on moving picture machines in the workshops of the New York Institute for the Deaf, where his wife taught; and in 1886 he applied for an American patent for a machine using one or more

lenses (illustrating the most difficult proposition, incorporating 16 lenses). The patent was granted in January 1888, but the U.S. Patent Office deleted claims for machines with one or two lenses as having been already covered by others. His patents in Britain, France, and elsewhere, however, allowed a one-lens version.

In Paris, in 1887, to demonstrate proof of working he produced a 16-lens machine. Although this was designed to use two picture bands moving alternately, the only surviving sequence is a single set of 16 images, suggesting that the tests may have been made with a fixed plate.

Back in Leeds Le Prince rented a workshop at 160 Woodhouse Lane and engaged woodworker Frederick Mason and J.W. Longley, inventor of an automatic ticket machine, and by the summer of 1888 had constructed a "receiver" (camera), with a single lens and intermittently-moving take-up spool. The patent suggests the use of gelatine coated with bromide emulsion, or "any convenient ready-made acting paper, such as Eastman's paper film," the "stripping film" which had recently been made available in the first Kodak amateur rollfilm camera. A paper negative sequence of the family cavorting for Le Prince's camera was exposed in his father-in-law's garden, apparently as early as October 1888. Scenes of his son Adolphe playing the melodion, and of traffic on Leeds Bridge, were taken at about the same time, at between twelve and twenty pictures per second.

Projection was more of a problem, due to the unsuitability of the paper base and the registration difficulties with unperforated bands. Undeterred, Le Prince built a "deliverer" (projector), having three lenses and three picture belts and apparently using a Maltese cross intermittent movement. This machine probably used belts of glass slides, the fibre belts moving alternately to ensure that an image was always on the screen, thereby reducing flicker. A single-lens projector was also built. These machines did not succeed to Le Prince's satisfaction, and he probably experimented with celluloid which offered a more suitable image base, in 1889/1890.

Also attempting to produce motion pictures in England at about this time were William Friese-Greene, with his associates Mortimer Evans (1889 patent) and later Frederick Varley (1890 patent); and Wordsworth Donisthorpe and William Carr Crofts (1889 patent). They all had some success in shooting sequences of photographs on flexible films, but like Le Prince, had serious problems with projection and were unable to present successful motion pictures to the public. In France, Etienne-Jules Marey had also produced sequence photographs on both paper and celluloid strips, but was mostly concerned with motion analysis—examining the individual images—rather than recreating movement on the screen. (Though he would later build a projector for his unperforated filmstrips, but it was never demonstrated).

While Le Prince was experimenting in Leeds, his wife and family remained in New York, having rented and renovated a mansion in preparation for showing his apparatus and motion pictures. Apparently troubled by financial problems, in the summer of 1890 he packed up his equipment in Leeds ready for the move to New York, and in August went to France with friends. He left them at Bourges to visit his brother Albert at Dijon, where he was last seen boarding the train for Paris on 16 September, and subsequently disappeared. In 2003, an 1890 photograph of a drowned man resembling Le Prince was discovered in the Paris police archives.

STEPHEN HERBERT

Biography

Louis Aimé Augustin Le Prince, was born in Metz, France, on 28 August 1841. His father Louis Le Prince was an army major; his mother was Elizabeth Boulabert. Le Prince spent much of his life in Leeds, England, with occasional business ventures in the United States. He took sequence pictures on paper "film," but was apparently unable to achieve successful projection. According to his employee Frederick Mason, Le Prince—Gus to his family—was most generous and considerate and, although an inventor, of an extremely placid disposition which nothing seemed to ruffle. Seven years after his 1890 disappearance, Le Prince was declared legally assumed dead.

See also: Friese-Greene, William; and Donisthorpe, Wordsworth.

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LE SECQ, HENRI (JEAN-LOUIS HENRI LE SECQ DES TOURNELLES) (1818–1882)

French photographer and painter

Henri Le Secq was born in Paris on August 18, 1818 to Auguste-Jean-Catherine Le Secq and Anne-Louise-Françoise "Dolly" Tournaire. Le Secq's father served as the chief clerk at the Prefecture of the Seine and eventually became mayor of the ninth arrondissement (today

Le Secq, Henri. Grandes figures au porche nord, cathédrale de Char.
The Metropolitan Museum of Art, Purchase, The Howard Gilman Foundation and Harriette and Noel Levine Gifts, Samuel J. Wagstaff Jr. Bequest, and Rogers Fund, 1990 (1990.1130) Image © The Metropolitan Museum of Art.

the fourth). Undoubtedly influenced by his father's service to Paris, Le Secq became a connoisseur of his native city, particularly its architectural treasures, as artist, antiquarian, and most notably, as photographer.

Le Secq began his artistic studies with the sculptor James Pradier in 1835. In 1840, he entered the studio of Paul Delaroche where he began painting genre scenes, and in 1842 he exhibited his first paintings at the Salon. In 1845, Le Secq followed Delaroche to Rome and returned to Paris in 1846. At Delaroche's studio Le Secq met fellow painter Charles Nègre. In 1848, with the instruction of artist/photographer Gustave Le Gray (also a student of Delaroche), Le Secq and Nègre began to experiment with photographic processes. In this year Le Secq married Marguerite-Fanély Palais.

Le Secq was one of many French photographers making calotypes, a paper negative/positive process invented by William Henry Fox Talbot in England in the 1830s. In 1850, Le Secq and Nègre began using Le Gray's waxed paper negative process which improved the translucency of the paper negative by rubbing wax on the paper before it was sensitized and exposed in the camera. Even when his contemporaries began using glass negatives, Le Secq continued making paper negatives. Le Secq's first use of photography was to make quick preparatory sketches of posed figures in genre subjects for paintings but soon he began photographing architecture. By the time Le Secq, along with Nègre, Le Gray and others, helped to found the Société héliographique in 1851, the first photographic society to be established, he was considered one of the best architectural photographers in France.

His fame as an architectural photographer led to Le Secq's inclusion in the Mission Héliographique, the first photographic survey of historical monuments in France. The group was arranged in 1851 by the Commission des Monuments Historiques, a group of French political antiquarians, architects, and archeologists. The Commission felt it urgent to preserve France's architectural heritage by documenting medieval buildings and monuments threatened by deterioration from neglect, as well as industrialization and restoration. The Commission hired five established architectural photographers to document five provincial centers in France. Le Secq was assigned the religious edifices of Champagne, Alsace, and Lorraine. Though the mission was never fully realized (due to difficulties in obtaining permanent prints) and only 300 paper negatives survive, the Mission provided Le Secq with experience in the field and an opportunity to perfect his skills at photographing architecture. Following this first commission, Le Secq documented the sculpture of Strasbourg, Amiens, Reims, Chartres, and various other churches around Paris.

Le Secq's photographs demonstrate both his roots in Salon painting and an interest in using the camera to reach heights and vantage points previously unattainable. To make "Flying Buttresses, Reims Cathedral," 1852, Le Secq climbed to a point where he could photograph the successive arches of the flying buttresses, a vantage point that the ordinary visitor to the cathedral would not be able to reach. By 1852, Le Secq had also turned to landscape photography and photographed stone quarries and woods around Montmirail. These works show the influence of paintings by Corot, Rousseau, Dupré, and Diaz. The landscape photographs were meant to be used as studies for artists. As in the architectural photographs, Le Secq utilized the calotype process's potential for murky, moody effects to an extreme by making long exposures, thus creating dramatic compositions of deep shadow.

Between 1849 and 1853, Le Secq photographed old monuments, buildings, and churches in various states of disintegration, such as "Tour St. Jacques," 1853, as well as demolitions and various public works projects begun by Jean-Jacques Berger, Prefect of the Seine. He also photographed Notre Dame, the old Hotel-Dieu, Amiens, and Chartres. His photographs of demolitions, such as

that of the king's stables in *Place du Carrousel*, 1852, seem to foreshadow Baron Haussmann's renovations of the city in the 1860s when demolitions and construction sites would appear throughout the city. Baron Haussmann was clearing many of Paris's old streets for his renovation of Paris into wide, modern boulevards. Le Secq's intimate knowledge of and love for his native city inspired his excursions with camera and tripod. He was particularly tied to his old neighborhood, the Saint Antoine section, which was being razed for the extension of the rue de Rivoli. Le Secq also captured the old Pont Neuf, Hôtel Dieu, as well as changes taking place around Hôtel de Ville, and assembled them into albums. In 1853 six of Le Secq's negatives, including those of Chartres, Strasbourg, and Beauvais, were used by print publishers such as Lerebours and Lemercier to make lithographs.

From 1851, Le Secq's photographs were included in exhibitions, including the Universal Expositions in London in 1851 and 1855, where he was acknowledged as one of France's greatest artist-photographers, and received a silver medal for work shown in Amsterdam in 1855. In 1856, he made several photographic still lifes, composed of objects, fruit, and vegetables. By this time, Le Secq's photographic career was drawing to a close although as the paper negative went out of use and the collodion on glass negative took its place. However, Le Secq did reprint many of his waxed paper negatives. For the rest of his life, Le Secq returned to painting and regularly exhibited at the Salon and formed his own art collection of contemporary printmakers and painters such as Whistler, and Millet, as well as artists Jongkind and Daubigny and major impressionists.

After the death of his wife and only daughter in 1862, he sold a large group of his own painting and drawing collections and began collecting forged iron, particularly ancient keys, locks, and signs. In 1863 Le Secq published a pamphlet on the reform of the Salon entitled *Les Artistes, les Expositions, le Jury*, edited by A. Cadart and F. Chevalier. The following year he wrote a second pamphlet for the defense of artists entitled *Aux artistes et aux amateurs des Beaux-Arts*. In 1882, Le Secq died in Paris, leaving his art and iron collections to his sons.

KAREN REED HELLMAN

Biography

Henri Le Secq was born in Paris on 18 August 1818. He began his artistic studies with the sculptor James Pradier in 1835. In 1840, he entered the studio of Paul Delaroche where he met fellow painter Charles Nègre. In 1848, with the instruction of artist/photographer Gustave Le Gray (also a student of Delaroche), Le Secq and Nègre began to experiment with photographic processes. In 1850, Le Secq and Nègre began using Le Gray's waxed paper negative process Even when his contemporaries often used glass negatives, Le Secq kept making photographs with paper negatives. Le Secq's first use of photography was to make quick preparatory sketches of posed figures in genre subjects for paintings but soon began photographing architecture. By the time Le Secq, along with Nègre, Le Gray, and others, helped to found the Société Héliographique in 1851, the first photographic society to be established, he was considered one of the best architectural photographers in France. In 1851, Le Secq was included in the Mission Héliographique, arranged by the Commission des Monuments Historiques. Between 1849 and 1853, Le Secq photographed old monuments, buildings, and churches in various states of disintegration, which foreshadow his later photographs of demolitions and architectural documents made during Baron Haussmann's renovations of Paris in the early 1860s. By 1852, Le Secq had also turned to landscape photography and photographed stone quarries and woods around Montmirail. Le Secq published two pamphlets on the reform of the Salon. Le Secq died in Paris in 1882.

See also: Talbot, William Henry Fox; Waxed Paper Negative Processes; Mission Héliographique; Société Héliographique Française; and Lemercier, Lerebours & Bareswill.

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LEA, MATTHEW CAREY (1823–1897)

American photographer and author

Matthew Carey Lea, also known, as Carey Lea, son of scientist Isaac Lea and Frances Carey Lea, was born in Philadelphia on 18 August 1823. An acknowledged authority on photochemistry in the late nineteenth century and a member of the Franklin Institute, Lea

began experimenting with the chemical properties of developer in 1864. Educated through tutors and the Philadelphia chemistry laboratory of Booth, Garrett and Blair, Lea particularly studied the function of silver in the development process. His scientific advancements of photographic processes included inventing the first mordant-dye picture in 1865 and increasing the clarity of developed dry plate negatives in 1880. Lea also wrote prolifically about his experiments. In 1864–1866, he assumed the position of American correspondent to the *British Journal of Photography* and became a steady contributor to the *Philadelphia Photographer* and *Photographic Mosaics*. In 1868, he authored *A Manual of Photography*. During the 1870s and 1880s, he continued to experiment with silver halide salts and the color process, including the description of "photo haloids" (i.e., metal compounds that resemble salt) in 1885 and the discovery of "allotropic" forms of silver of various colors between 1889 and 1891. On March 15, 1897, Lea died in Philadelphia, two years after his election to the National Academy of Sciences.

ERIKA PIOLA

LEGEKIAN, G & CO
(dates unknown)

The name "G Legekian" is found on a large number of very fine images of Egypt from the late nineteenth century, but very little is known of the photographer(s) who created them.

Known to have produced dry-plate images from 10"x8" up to 'mammoth' 20" × 16" images, the Cairo-based Legekian studio—next door to the well-known Shepheard's Hotel (misspelled "Shephard's" on his cards)—was at the forefront of the tourist market from c.1880.

Legekian himself is believed to have been Armenian, but personal details are significantly difficult to find.

In 1883 or 1884 the Legekian studio was appointed Photographers to the British Army of Occupation in Sudan, and that appointment signalled a temporary change of language on their photographs—from French to English, and from *G Legekian photographie artistique, atelier special de peinture* to *G. Legekian & Co*. In 1890, some *cartes-de-visite* include both appellations. By 1891, however, their cartes and larger pictures were once again captioned exclusively in French.

Several Legekian images from the late 1890s were included in the book *Celebrities of the Army* published by Newnes in 1902, and the 1906 book *New Egypt* records that Legekian "has, besides some remarkable portraits, a unique collection of views both in large prints and in postcards."

JOHN HANNAVY

LEGGO, WILLIAM AUGUSTUS
(1830–1915)

Inventor, leggotyper, engraver, and publisher

William Augustus Leggo, was born Quebec, Quebec, 25 January 1830; died Lachute, Quebec, 21 July 1915. Trained originally as an engraver, first by his father, William Augustus Leggo Sr., and later by Cyrus A. Swett with whom he completed his apprenticeship in Boston, Leggo had by 1850 established himself as an engraver in Quebec City. From this traditional print background, Leggo, together with George Edward Desbarats (1838–1893) who became Leggo's business partner in 1864, went on in the 1860s and 1870s to pioneer important advances in the graphic arts though the application of photography to early photomechanical printing processes. Indeed in 1869, their efforts contributed towards revolutionizing global communication in terms of how newspapers were illustrated by their publication of the world's first letterpress halftone reproduction of a photograph.

Leggo's and Desbarats' early photomechanical process, named leggotyping, was first identified in 1864 as an improved photoelectrotyping process to provide an inexpensive, rapid means of producing accurate facsimilies of any type of line image via either relief or intaglio plates without assistance of engraving or other hand work. With Desbarats financial backing, Leggo continued to perfect the process and to expand its application to allow halftone images of photographs and other tonal works to be photomechanically reproduced using a type-compatible format. The goal to expand leggotyping to halftone work was achieved in September 1869 when a Canadian patent was granted for "Leggo's granulated photographs." Shortly thereafter, Leggo and Desbarats put their line and halftone photomechanical discoveries to commercial use to illustrate Desbarats' new pictorial weekly the *Canadian Illustrated News.* Launched October 30, 1869, the Montreal based paper featured a cross-lined screen halftone of William Notman's photograph of His Royal Highness Prince Arthur in its inaugural issue. Leggotyped line and halftone images were also used to illustrate *L'Opinion publique*, Desbarats' french language counterpart to the *Canadian Illustrated News,* and the process became a speciality of the two partners' firm, Leggo & Company.

Further advances in halftone reproduction followed in September 1870 when Leggo and Desbarats applied their recently patented process which married lithography and leggotyping to the pages of the *Canadian Illustrated News,* making it the first periodical to have its illustrations printed planographically. The process was also applied to *L'Opinion publique* beginning 1871 and to the partner's illustrated newspaper, the New York *Daily Graphic,* which they launched March 4, 1873.

Within a year of starting their new American venture however, Leggo's and Desbarats close professional ties were severed when Desbarats encountered financial difficulties which left him insolvent. Leggo himself remained with the *Daily* Graphic as publisher and continued his research with photomechanical processes for some years. By 1879 however, Leggo had returned to the Montreal, where he appears to have remained in the area the rest of his life.

Beyond directing his considerable creative talents to the development of new photomechanical processes, Leggo also obtained patents for a variety of other interests, including telegraphy and photographic equipment. For example, in 1869 Leggo developed a camera to photograph architectural subjects which eliminated a problem other cameras then experienced of distorted perpendicular lines in the resulting photograph. A valuable improvement, in general, to outdoor photography, its improved picture taking capabilities were actively demonstrated to all in leggotyped half-tone within the *Canadian Illustrated News* and *L'Opinion publique*.

Terresa McIntosh

LEITZ, ERNST (1843–1920)

Ernst Leitz (I) was the first in the father-son-grandson sequence of men with that name who succeeded one another as leaders of the renowned family-owned German firm of Ernst Leitz Wetzlar GmbH. He was born on the 26 April 1843 in Sulzburg (not Salzburg) in the southwestern German province of Baden. Ernst was the youngest of three children born to Christina Elizabeth Leitz (née Doebelin) and Ernst August Leitz, both of whom were teachers at the high school of Sulzburg. The parents were very religious and wanted young Ernst to study theology, but the latter had a very practical disposition and he was able to persuade his father to let him pursue a career in mechanical craftsmanship. The father arranged for Ernst to embark on an apprenticeship with the instrument maker Christian Ludwig Oechsle in Pforzheim, also in Baden, a town known for its jewelry makers and goldsmiths. Oechsle's establishment had the impressive name "Workshop for Physical and Chemical Instruments and Apparatus and Machines of the Mechanic Oechsle, Gold Controller for the Grand Duke of Baden." The shop produced a great variety of physical equipment, as shown in its 1855 catalog, which had 24 sections with a total of 553 items, including a few optical devices. Under the tutorship of the exceptionally competent Oechsle, Ernst Leitz was able to acquire a wealth of knowledge and skills that would ultimately stand him well as a solid foundation for his trade. But it appears that he realized early on that excessive versatility that did not yield a top performance in any particular field might lead him to become a jack-of-all-trades. This portended his eventual career.

As was the custom at that time, after completing his apprenticeship, Ernst Leitz (I) began traveling as a journeyman. He visited one of his sisters in Vevey in Switzerland and after a brief time in Zurich, he found a job as an assistant to Mathäus Hipp, a prominent manufacturer of electric clocks in Neuchâtel. It is there that he first became acquainted with the process of mass production of precision parts for world-famous Swiss watches that was already routine in Swiss factories. This manufacturing process was of fundamental significance later on when he became the sole owner of a precision manufacturing enterprise. The aforementioned Oechsle also produced precision instruments, but they were made individually, which required more time, so that their prices were significantly higher.

While working for Hipp, Ernst Leitz (I) met Karl Junker from Giessen, a university town north of Frankfurt, Germany. Junker was on his way to Paris after having worked for Friedrich Belthle, who in 1855 had taken over the Optical Institute, a small microscope manufacturing enterprise founded in nearby Wetzlar in 1849 by Carl Kellner (1826–1855). Junker encouraged Ernst Leitz (I) to visit that institute because it was in serious need of competent instrument makers. Heeding that advice, Leitz joined that small firm in Wetzlar in early 1864 and only one year later, on 7 October 1865 he became Belthle's partner. Belthle was not an efficient manager, he was in poor health, and he did not cultivate adequate connections with the world of science, so that the demand for his microscopes was quite limited. When Belthle passed away in 1869, Ernst Leitz (I) became the sole owner of the company and named it "Optisches Institut von Ernst Leitz," a name that prevailed in various mutations for 119 years thereafter.

A memorable event in the career of Ernst Leitz (I) occurred on 21 September 1864 during the 39th Congress of German Natural Scientists and Physicians in Giessen, where Ernst Leitz (I) demonstrated Belthle's microscopes and where Philip Reis (1834–1874) successfully demonstrated a telephone that he had invented. Reis had demonstrated it before, but the construction was faulty until Ernst Leitz (I) became interested in it and helped Reis to build a properly functioning model, based on the knowledge of electricity, electro-magnetism and instrument making that he acquired during his journeyman years. Reis' telephone was acclaimed at that congress, but it was only promoted to institutes of physics and Reis did not possess the foresight and know-how for marketing it to business users and to the public. Only one year after Reis' death of tuberculosis on 14 January 1874, 11 years after his successful demonstration, the American Alexander Graham Bell (1847–1922)

presented an improved model and was generally credited as the inventor of the telephone.

Not yet 30 years old when he took over, Ernst Leitz (I) revitalized the lagging company by implementing the series production methods that he had learned in Switzerland, gradually overcoming the earlier lack of innovations, the growing competition and the slump caused by the outbreak of the Franco-German war in 1870. His new methods enabled him to offer faster delivery times that were quite unusual at that time. This and the participation in nature- and medical congresses with practical demonstrations brought him into closer personal contact with personalities from science and technology from well beyond the nearby universities of Giessen and Marburg. As a result, Leitz microscopes and their accessories began to gain favor in the right circles. It was in 1870 that Leitz published his first price list under the wordy title *Current prices of the achromatic microscopes of the institute founded by C. Kellner in Wetzlar, successor Ernst Leitz (formerly Belthle & Leitz) 1870.*

During these years the fields of medical histology, pathology, and bacteriology were being rapidly developed primarily by German scientists with the aid of affordable, serviceable German microscopes designed with these fields' requirements in mind. The production of Leitz microscopes began to grow vigorously, in spite of increasing but stimulating competition from Carl Zeiss, who had begun producing microscopes in 1858 and who had engaged the services of the brilliant physicist and mathematician Ernst Abbe. Additional competition was rendered by Georg Oberhäuser-Hartnack, a German citizen who had immigrated to Paris, where he produced microscopes that were cheaper and that performed better than the Belthle microscopes. Engelbert & Hensoldt also produced competing microscopes, as did the Wetzlar brothers Wilhelm and Heinrich Seibert in cooperation with a man named Gundlach. All of them had worked with Leitz's predecessors Kellner and/or Belthle at various times before setting out on their own. The statistics show that microscope production improved dramatically after Ernst Leitz (I) took over in 1869**:**

1849–1860	circa	400 microscopes
1861–1870	circa	600 microscopes
1871–1880	circa	2,500 microscopes
1881–1890		13,650 microscopes

The 10,000th microscope was completed in the year 1887.

Ernst Leitz's (I) older son Ludwig had developed a compact and inexpensive photomicrographic apparatus in 1882, which led to the development of three lenses for general photography marketed by Ernst Leitz (I) in 1886 called Summar, Periplan, and Duplex. The initial focal lengths were 24, 42, and 64 mm, with a maximal aperture of f/4.7. The series was later expanded and pages 608 and 609 of the 12 September 1901 issue of the London magazine "Photography" published a highly favorable report on the wide-angle performance of a Periplan No.5 lens with a focal length of approximately 8 inches (203 mm). The awareness of photography already existed during the earliest times of the firm, as evidenced in a letter in which Carl Kellner informed his friend and occasional associate Moritz Hensoldt that he had built a lens for a Daguerreotype camera. The superb quality of Leitz lenses for photography was to become one of the company's most famous attributes.

Competition triggered strong awareness of the need for improvements and innovations, and as early as 1877 Ernst Leitz (I) created a scientific department dedicated to research and development in optics. The man placed in charge was the mathematician Karl Metz, who already had experience in the computation of lenses for telescopes. The initial task was to improve the company's own achromats, building on the pioneering work already performed elsewhere by Gauss, Helmholtz, and Abbe, and later applying the possibilities provided by new types of optical glass supplied by the prominent glass laboratory of Schott & Genossen that was founded in 1886 in Jena with government support.

The growing demand for Leitz microscopes and many related instruments led to several expansions of the manufacturing space that had started in a regular house in Wetzlar that served as both a family residence and a factory, followed by several moves to larger facilities that culminated in a stately group of buildings at the foot of a hill topped by the Kalsmunt castle, where the Leica Microsystems Company buildings still stand today. At one point there were three separate substantial buildings at this location that housed the mechanical shop, the carpentry shop, and the optical shop.

Ernst Leitz (I) was a personable individual who maintained friendly relations with persons from scientific, industrial and academic circles, and this inspired him to tailor his products to their respective needs. He also had a talent for attracting and nurturing the right people for the jobs. In a significant example, he recognized the skills of Oskar Barnack and encouraged him to come to work in Wetzlar, in spite of the fact that Barnack suffered from severe asthma. Leitz offered him all the time he needed for trips to health spas and even accompanied him on some of these trips.

Barnack had worked at Carl Zeiss in Dresden and Jena from 1902 to 1910, where he had approached Director Guido Mengel of ICA, a camera-making subsidiary of Zeiss Ikon, with a prototype of a 35 mm camera that he had built, but Mengel had rejected it. At the suggestion of Emil Mechau, who had left Zeiss earlier to work on motion picture projector design at Leitz, Barnack eventually, albeit reluctantly (for health

reasons), also accepted a position at Leitz, where began working in the newly created experimental department on 2 January 1911. Ernst Leitz (I) was intrigued by Barnack's unconventionally small camera and he took it along on a trip to New York and used it to take quite a few candid pictures. That camera was the so-called "Ur-Leica," an improved version of which was placed in production by Ernst Leitz (II) [the son] in 1924 and introduced at the Leipzig Spring Fair of 1925, eventually becoming the legendary Leica camera whose subsequent models are still in production today!

Ernst Leitz (I) had a trait that was a strong characteristic of the Leitz family for the generations that followed, in that he was genuinely concerned for the welfare of his employees and he knew nearly everyone by name and would chat with them warmly during his regular rounds through the shops. He introduced the eight-hour workday and health care assistance and in 1899 a pension for invalids, widows, and orphans. His equally social-minded wife Anna Leitz visited families in need and she would discreetly slip money into their pockets to help them with their expenses. As a result, "der alte Chef" (the old boss) and his family were affectionately revered by his employees. In recognition of his achievements and his benign social engagement, on 24 December 1910 the University of Marburg bestowed an honorary degree of Doctor of Sciences upon Ernst Leitz (I).

Ernst Leitz (II) remained active until the end of his days. While on a health visit to Solothurn in Switzerland, he passed away on 12 July 1920, having survived his wife by 12 years. Because his first son Ludwig Leitz had died of a riding accident at the prime of his career in 1898, his second son Ernst Leitz (II) took over management of the company, which continued to flourish under his competent guidance.

ROLF FRICKE

LEMERCIER, LEREBOURS AND BARRESWILL

Rose-Joseph Lemercier (Paris, 1803–1887), and Aloïs Senefelder, a pupil from 1817 to 1819, worked in the Senefelder printing house directed by Knecht from 1825 to 1829. Lemercier established a lithographic printing house in 1829 in Paris, 57, rue de Seine. He came to photography in 1839, and produced his first daguerreotypes. At the beginning of the 1850s, he became interested in photomechanic process. During this period, the obstacle was in obtaining stable photographic images. The rapid fading of some silver-based prints initiated a search for a more reliable and commercially viable process. The future of photography depended on it. This issue became the central point of focus for the Société d'encouragement pour l'Industrie nationale. The Society became one of the most important institutional forces for the development of photography. More than any other group, it foresaw the development of photography as an industry and organized competitions to encourage photographers to produce photographic prints that were of high quality, economical to produce and easy to conserve. As early as 1840, the Society concluded that if it were to progress in the industry, photography needed to abandon pre-industrial hand-made means for more modern means geared toward mass production.

From 1852 to 1854, Lemercier linked up with Lerebours, Barreswill and Davanne. Noël Lerebours (1807–1873) was optician, founding member of the Société heliographique and builder of photographic material; Barreswill was a chemistry professor at the Turgot school as was Alphonse Davanne (1824–1912).

Together they developed the lithophotographic process, which was based on the work of Niépce de Saint-Victor. This process consisted of pouring a solution of bitumen of Jude on a lithographic stone. The stone was then exposed under a negative (paper or glass). The bitumen then received the light and hardened in the areas not exposed to light. The image formed was then engraved with acid and washed from its bitumen. The hardened areas remained after the acid wash, and were then covered with printing ink. After pressing the image onto paper, the image was transferred to the paper, providing various shades and tints.

Lemercier and his associates sent sealed letters containing lithophotographic prints to photographers, the prints which were later presented by François Arago in a lecture to the Academy of Sciences on August 16, 1852. They asked for an invention patent of fifteen years on July 3, 1852, the request was accepted on August 25, 1852. Next year, Lemercier established in his lithographic studio, a photographic printing house, where he produced prints from the negatives of Henri Le Secq. Looking for a renaissance in the photographic underworld, six of those prints from Le Secq were published as prototypes of lithophotography in a treatise on the new process entitled *Lithophotographie ou impressions obtenues sur pierre à l'aide de la photographie, 1er cahier*. It was published in notebook at the Academy of Sciences in January 1854.

The prints from Le Secq represented subjects of architecture and architectural sculpture that he photographs for the Missions heliographique. They accurately reproduced old monuments and the printing on paper gave the grain conferring a certain aesthetic. Lemercier certainly tried to find an outlet (and a market) for the production of prints from the Missions heliographique. That commision, the first photographic project initiated by the French government through the Commission des monuments historique, needed printers able to produce stable images in a timely manner and as accurately as

photographic prints. Lithophotography was real progress and it easy to do. It was also less dangerous than the previous processes, and more suitable to industrial production, but because of the grainy stone, details lost their precision. By founding this photographic printing, Lemercier tried to fulfil the wish, announced in 1851, of the Société heliographique. The request was to have a photographic printer in the company itself to produce the images of photographers and commissioned project studies, which had typically been failing because of a lack of means.

In 1855, Alphonse Poitevin (1819–1882) improved the process and utilized it in his studio until 1857. Named photolithography, his process was based on the mix of albumin and bichromate of potassium propriety to retain, after exposure to light, the printing ink. The bichromate gum has been a decisive discovery of Poitevin's and a tremendous progress for photography in that it was easier to prepare and more accurate in results, and so it took the place of the bitumen of Jude in the sensitive processes of the printing plates. On October 27, 1857, for reason of poor management of business, Lemercier bought Poitevin's studio and patent, and used photolithography in his printing house. They created together a society in collective name for the utilization of the process. The profits were split down the middle. The society was later divided in February 1867. Corine Bouquin and Sylvie Aubenas showed that the use of the patent would unfortunately reveal itself barely profitable, the stress of which put the two men at odds with each other. In 1859, Poitevin began legal proceedings against Lemercier for not having put the complete title "Procédé Poitevin" on the bottom of the plates, instead putting only "P. Poitevin," and for paying less than the full cost of the patent. The judge ruled in January 1860, in favour of Poitevin.

Several photographers gave their negatives to Lemercier to print their images, like Bisson brothers, and Julien Vallou de Villeneuve, but this production stayed experimental or limited. Lemercier never really exploited his process. However, he developed the photolithography to illustrate scientific and artistic books. Two albums were published thanks to this technique: *Le Sérapéum de Memphis* by Auguste Mariette in 1857, created from Charles Marville's and Paul Berthier's negatives (30 plates); the book of Jules Labarte *Histoire des Arts Industriels* (1864–1866) about decorative arts, created from the negatives of Marville and Berthier (150 plates).

Lemercier also printed images which were not lithophotography but photographic prints. The Bisson brothers made *L'œuvre de Rembrandt reproduit par la photographie, décrit et commenté par Charles Blanc* (60 plates) and *Choix d'ornements arabes de l'Alhambra offrant dans leur ensemble une synthèse de l'ornementation mauresque en Espagne au XIIIe siècle reproduit par MM. Bisson frères* (19 plates) in 1853 in Lemercier's studio. As well as twelve images included in the *Monographie de Notre-Dame de Paris et de la nouvelle sacristie de MM. Lassus et Viollet-le-Duc* published the same year. In 1857, Lemercier also edited prints of Varroquier's and the series of stereoscopic views of Furne and Tournier's, who settled in the studio at rue de Seine two years later. The subjects were genre studies and living compositions of trade and craft, like farmers, launderess, blacksmith, hitchers, landscapes, mythology recomposed, models of nudes, scenes from operas, interiors of artist studios, taverns, and oriental interiors.

Photolithography was practice until about 1867 in Lemercier's studios, "putting his press at the service of clichés of authors at the same price conditions as ordinary lithography" write Joly-Grangedor in 1871 (BSFP 1871, 110.) The same year, Poitevin won the great duc de Luynes competition for his process of photolithography and Lemercier received a medal from the SFP for his works on his technique. But because it was not cost efficient, the process was flawed, and in December 1866, Lemercier complained to Poitevin of not making any profits off his patent. Poitevin later made an agreement with Cyprien Tessié du Mothay, associated with Charles Maréchal, who bought in March 1867 the rights of Poitevin. Lemercier, who did so much for photolithgraphy modified it into phototypy which yielded superior images. In 1873, Lemercier bought the patent of Albert of Munich's process of "Albertypy" and uses it until 1887. He also practiced photoglypty in his establishment. He presented prints in 1881 at the Ring of bookshop exhibition and in 1882 at the photographic exhibition of the Central union of decorative arts. He was awarded, at this exhibition a gold medal. Also, in 1879, Lemercier participated in the Léon Vidal lectures on industrials reproductions of works of art which took place on Wednesday at the National School of the Decorative Arts, stating, "Thanks to the obliged support of the Lemercier & Cie house, photoglyptic experiences could have been made in the presence of the pupils of the School" (*Le Moniteur de la photographie,* March 1, 1879, 33–34).

In 1887, he donated to the Société française de photographie an album of Algeria and Tunisia views. He died in Paris in January the same year.

In spite of his efforts, Lemercier stayed with the lithograph, and thus photography for him, never took a real importance in his printing house. Photolithography and the following processes born from this, remained as images printed on a plate, which represented a retreat in relation to wood engravings printed in text and,

later photoengraving. Lemercier's production however, marks an important step in the insertion of photography into books.

LAURE BOYER

Exhibitions: Amsterdam 1855, Paris 1855 (2d section), Paris SFP 1857, Bruxelles 1857, Paris SFP 1859.

Publications: *La lithophotographie ou impressions obtenues sur une pierre à l'aide de la photographie»,* 1er cahier, par MM. Lemercier, Lerebours, Barreswill et Davanne, Paris, Goupil, Gide & Baudry, London, Gambart, 1854.

Medals: London 1844, medal of honour; Paris 1848, medal of honour; London, 1862, mention honourable; Porto, International exhibition, 1866, medal of honour; Paris, SFP, 1867, medal for his work on photolithography; Chevalier of the Legion of Honour; Paris, Photographic exhibition of the Central union of the Decorative Arts, 1882, gold medal.

See also: Bisson, Louis-Auguste and Auguste-Rosalie; and Société Française de Photographie.

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LEMERE, BEDFORD (1839–1911)

Bedford Lemere and his son Harry Bedford Lemere are the most outstanding English architectural photographers of the nineteenth century by virtue of the sheer scale and duration of their quality output. Studies of English urban life cannot take place without taking into account these key visual documents of late Victorian England.

From the early 1870s until well into the twentieth century both photographers operated from the same address, 147 Strand which was conveniently and symbolically situated on the border between the City of Westminster and the City of London. By the 1880s the company had became the standard for large format architectural work in Britain. Taking over the premises of Valentine Blanchard the firm did not vacate the same studio until after 1945. The core clientele of Lemere existed between the poles of the City of London and fashionable Westminster thus covering both the domestic and tourist areas of the West End as well as the intensive banking and commerce in the City. It thus encompassed the entire spectrum of business, bourgeois and aristocratic London. Though London generated much of the business there were extensive clients throughout the rest of England: Lemere was employed by the Rothschild family to document their county estates, their mansions in Westminster and their offices in the City—along with their sporting and collecting activities. The key art dealer Duveen used Lemere to provide the best images of his desirable stock of antiques and paintings. In the dark winter months studio commissions also came from legal firms, piano makers and fine silver manufacturers. Urban coverage is also extensive for areas in Liverpool, Manchester, Birmingham, Edinburgh, and Glasgow and other provincial cities. The only known foreign commission is significantly linked with a holiday by Queen Victoria in a grand hotel the South of France. During World War I Lemere was able to diversity by specialising in manufacturing and armaments often linked with the peacetime shipping business.

By deliberately cultivating architects and their clients from the outset Bedford Lemere built up such a sophisticated network of designers, owners and estate agents that by the 1890s prints from his standard 12x10 inch plates could be found in key families, businesses and institutions ranging from Queen Victoria and the Rothschild family to official government bodies and department stores like Harrods. Sets were purchased by architects in the United States wishing to learn about fashionable English design like the Queen Anne movement.

The professional work of Lemere first comes to attention with the important series of carved details designed to educate those studying and applying the tenets of the Gothic Revival through the collection of medieval ornament displayed at the Architectural Museum in 1872 [later the Royal Architectural Museum]. With support from the prominent architect John Pollard Seddon and with endorsements from John Ruskin, Lemere rapidly became associated with major Architects like G. E. Street, G. G. Scott, and, later, Richard Norman Shaw. In addition there are many associations with interior decorators, stained glass and furniture designers, and a range of art-manufacturing companies.

With the exception of churches, a huge range of building types were covered: best known for his total control

of elaborately decorated domestic interiors, especially country houses, Bedford Lemere never employed more than two or three assistants who maintained the objective, sober and all-inclusive style which from 1897 was emulated by photographers employed by *Country Life* magazine. This somewhat dry style without much human incident indoors exhibits a cumulative effect through carefully controlled composition and obsessive attention to detail. The images provide unparalleled records for contemporary commissioners and, today, for several national archives. Along with architecture a profitable maritime sideline was built up recording similar interiors of ocean liners and by the mid 1880s Lemere became the single most important photographer in this area being employed by Cunard, White Star, Canadian Pacific, and other transatlantic shipping companies. In 1887 with agents in New York and Paris some 8,500 images in 17 series were being advertised.

Possible rivals for the crown of architectural photography in England include Charles Latham, Horatio Nelson King, S. B. Bolas and the photographers connected with *Country Life* but though they all created superior images none were ever able to emulate the single-minded continuity of Lemere whose ability to sum up interiors using just one plate per room was evident for over 70 years. The company survived the death of H. Bedford Lemere in 1944 [when glass was still being utilized] but the decline in demand at the same time for large format plates meant that 1944 represents the zenith of large-format architectural photography in Britain.

The output and style of Bedford Lemere was seamlessly taken over and developed into a recognisable style by his son in the late 1880s as commissions diversified yet further whilst retaining the architectural core. Apart from a complete set of negative registers very little other documentary evidence has survived which is a pity since both father and son must have had considerable skills in cultivating such an extraordinarily diverse set of contacts across England linked with every aspect of architecture and property.

Perhaps one-third of the estimated total output of 100,000+ images now survive, most of them at the National Monuments Record, English Heritage. Nevertheless, even this partial survival represents one of the most detailed records ever created of Victorian and Edwardian life; it avoids the usual topographical and tourist views and systematically depicts the exteriors and interiors of everything from modest suburban houses to factories and palaces. The quality and extent show that Bedford Lemere ought to be considered a delineator of Victorian preoccupations with décor, class and industry. These unique records should be consulted by any historian concerned with design, architecture or taste in Britain. In a medium where absences are commonplace, the survival of even a fraction of this visual density means that this work archive is one of the most important in Britain.

IAN LEITH

Biography

Bedford Lemere was born in Maldon, Essex, and established his photographic career in the 1860s before he founding his own company at 147 Strand, Westminster c. 1867. In 1862 he married Anne Pennyfeather at St Pancras church, London. By the late 1880s control of Bedford Lemere & Co. passed to his son Henry [Harry] Bedford Lemere [1865–1944] who later became President of the Professional Photographers Association [1930]. The company was at the same address until the late 1940s and then relocated to South London before being absorbed in another concern. Apart from very detailed registers and a small fraction of the negatives much has been lost including all correspondence linked with commissions and all negatives taken 1929–1944. Surviving negatives, prints and proof print albums were purchased from the 1950s onwards by the Royal Commission on the Historical Monuments of England [later English Heritage]. Over 20,000 negatives and prints along with a complete set of registers survive with the National Monuments Record, English Heritage. Scottish negatives are held by the Royal Commission on Ancient and Historical Monuments of Scotland, Edinburgh. Most Shipping negatives are at the National Maritime Museum, Greenwich. Substantial print holdings exist in the Guildhall Library, City of London, and at Westminster Archives but many others are known to exist throughout English archives. Several archives in the United States and Canada hold images of the Architectural Museum as well as later material.

See also: Blanchard, Valentine; and King, Horatio Nelson.

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LENSES: 1. 1830s–1850s
Technical and equipment

In 1812, William Hyde Wollaston showed that a positive meniscus lens, used with the concave side facing the object being viewed, significantly flattened curvature of field. Wollaston further flattened curvature of field by placing a stop at a distance in front of the lens, rather than directly in front, which had been the practice beforehand. This introduced a slight amount of barrel distortion.

Wollaston's lens was used by Nicéphore Niépce in his 1820s–1830s experiments with light-sensitive asphaltum. Due to the low light sensitivity of the processes, Niépce was forced to use the lens without a stop. He also found that the Wollaston lens suffered from chromatic aberration.

In 1833, Niépce's successor, Louis Jacques Mandé Daguerre, switched to an achromatic, positive meniscus lens constructed by Charles Chevalier. At first Daguerre reversed the lens, so that the stop faced the sensitized surface of the plate and convex side of the lens faced the object being photographed. Using the lens in this way, he hoped to take advantage of the condensed light at the center of the image. By 1839, and the public announcement of the daguerreotype process, he had returned to using the lens with the concave side of the lens facing the object being photographed and the stop in front. This marked an achromatic return to Wollaston's original lens arrangement.

The first camera marketed for Daguerre by Alphonse Giroux contained a similar achromatic, positive meniscus element. Because the lens needed to be stopped down to f/14 to obtain a flat field, portraits were impracticable due to the long exposure times involved; however, the lens was suitable for landscapes, architectural subjects, and still-lifes. Chevalier was soon overwhelmed by the demand for lenses, and an achromatic, plano-convex lens was substituted by his optical rival, Noël-Paymal Lerebours. Here the flat side of the lens faced the object being photographed.

By 1840, the public demand for photographic portraiture led opticians to attempt lens designs that could be used at full aperture. Returning to a duplet telescope he had designed 1834, in which two achromatic lens elements were separated by an appreciable distance, Chevalier modified it to arrive at his *Photographe à verres combinés* [Lens Made from Combined Glass]. For many years, this was the only lens capable of providing a flat field with whole-plate images when used at full aperture. It also was the first convertible lens, meaning that the lens barrel could be taken apart and the lens elements changed, depending on the subject being viewed and the format size desired.

Chevalier's lens was followed in 1840–1841 by another portrait lens, designed by Josef Max Petzval and marketed by the Voigtländer firm of Vienna. This lens could also be used at full aperture and was eventually achromatized, although the first 720 examples remained uncorrected for chromatic aberration. One difference it had with the Chevalier lens was that it condensed light at the center of the image. This provided for a shorter exposure time and centralized focus, combined with a gradual darkening of the borders of the image. More analogous to the aesthetic of portrait miniatures, it became an instant success with Daguerrian portraitists, and since Petzval had failed to secure the property rights to the lens, French and English opticians were free to copy the design and offer competing versions.

Throughout the remainder of the 1840s–1850s, photographic lenses generally divided into two classes: landscape lenses and portrait lenses.

Landscape or single lenses were at first identical to the 1830s achromatic positive meniscus advanced by Chevalier, with a stop being placed in front of the lens element at a distance equal to one-fifth of the lens focal length. These took in a narrow field of view and were composed of two types of glass, flint and crown, with the softer flint glass being located in front.

In 1854, J. H. Dallmeyer introduced a landscape lens that consisted of three meniscus elements cemented together to form an achromatic, positive meniscus lens element. This took in a much wider field of view, coupled with a significant amount of barrel distortion. The placement of a harder crown glass in front protected the lens from atmospheric pitting, to which previous landscape lenses had been subject. In 1857, Grubb modified this to form a two component landscape lens, with the crown glass in front and the flint glass behind.

Portrait or double lenses were generally variants of either the Chevalier or Petzval design. With the exception of Chevalier's lens, portrait lenses during the 1840s–1850s took in a very narrow field of view, and due to problems with curvature of field and astigmatism, were not suitable for landscapes or architecture.

In 1857, Petzval introduced an improved version of his portrait lens, based upon an unrealized 1840 design. This consisted of an achromatic, negative meniscus lens element in front and an achromatic, positive lens element in the rear, thus forming an early telephoto lens. The lens was capable of a flat field and even illumination, and was intended for architectural subjects and two-dimensional copy work. Introduced as the *Photographischer Dialyt* [Dialytic Lens], with the stop located in front, it came to be known as the Orthoscopic lens, with the stop being later relocated in between the lens elements.

Attempts to widen the angle the angle of view and correct curvilinear distortion during the 1840s–1850s usually involved symmetrical duplet arrangements, with the convex faces of opposing identical elements being oriented outwards. The first arrangement of this type was in 1841, when Thomas Davidson placed two achromatic landscape lenses face to face. This was followed in 1844 by G.S. Crundell mounting two uncorrected Wollaston meniscus lenses around a central stop. Such lenses were largely unsuccessful, due to the compounding of an already significant curvature of field problem.

In 1857, Thomas Sutton advanced a theory explaining how a symmetrical triplet lens, consisting of two opposing, achromatic plano-convex elements surrounding an uncorrected bi-concave element made of quartz, would be exempt from distortion and capable of a flat field. Stopped down, this would have been a practical wide-angle lens; however, due to the absence of surviving examples, it does not appear to have been a commercial success. It was allegedly marketed by Andrew Ross for a short period in 1859.

Alan Greene

See also: Chevalier, Vincent, and Charles; Lenses: 2. 1860s–1870s; Lenses: 3. 1880–1890s; Petzval, Josef Max; Ross, Andrew; Sutton, Thomas; and Wollaston, William Hyde.

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LENSES: 2. 1860s–1880s

The period 1860–1880 saw a number of developments in optical design which significantly improved the technical characteristics and speed of the photographic lens, the most important of these was the Rapid Rectilinear lens introduced in 1866.

In Britain John Henry Dallmeyer (1830–1883) and in Germany Dr. A. H. Steinheil (1832–1893) almost simultaneously announced the Rapid Rectilinear or Aplanat lens in 1866. The symmetrical design was important and came between the early period Petzval, Doublet, and meniscus-type photographic lenses, and the introduction of the Anastigmat in 1890. The design was very successful and remained one of the most popular until the 1920s and was available in wide-angle and long-focus versions. It was fitted as a general purpose lens to many field, hand and rollfilm cameras, including most standard Kodak folding cameras made between 1890 and the 1920s.

Dallmeyer's design was the subject of British patent 2502 of 27 September 1866 which described "Improvements in compound lenses suitable for photographic uses." The design as originally patented was slightly modified to become the rapid rectilinear lens which minimised optical distortion and with an aperture of up to f/6 and a field of view of around 50 degrees. Both the Dallmeyer and Steinheil lenses were composed of identical halves each half having about twice the focal length of the double objective and importantly made use of flint glass of different densities.

Steinheil introduced an almost identical design to Dallmeyer's which he called the Aplanat. It was designed by the mathematician von Seidel and was another significant example of the application of mathematical computation to lens design. Dallmeyer and Steinheil entered into a public and acrimonious debate over who had produced the lens first. Steinheil probably had priority by a few weeks but his claims of piracy of the design were not proven.

The design was extremely successful and widely copied by lens manufacturers who issued their copies under a variety of names including the well-known Euryscope, Pantoscope, Symmetrical and Universal. The Bausch and Lomb Rapid Rectilinear was particularly widespread well into the twentieth century.

While the Rapid Rectilinear lens was the most important of the 1860–1880 period there were other lenses that were useful. Steinheil began experimenting with unsymmetrical lens systems producing the Group Aplanat of 1879. The design corrected longitudinal aberrations and was further refined in his 1881 patent.

Dallmeyer, from the establishment of his firm in 1860, produced a number of other improvements to photographic optics especially producing "fast," or wide aperture, portrait lenses. In 1862 he introduced his Triple Achromatic lens which offered a lens with minimal distortion, working at around f/10. The lens was popular until it was superseded by the Rapid Rectilinear in 1866. The Dallmeyer Patent Portrait lens, also based on his 1866 patent was a variant of the Petzval lens.

The other well-known British lens manufacturer Ross introduced in 1864 a low-aperture distortionless lens which appeared in three variations all under the name

Doublet. The design was superseded by the Rapid Rectilinear. Ross also introduced the Actinic Triplet, similar to Dallmeyer's Triple Achromatic lens. In Germany Voigtländer marketed a patented portrait lens in 1878, based on the Petzval design.

While the corrected symmetrical lens designs were the most important technically and commercially there were a number of design for symmetrical lenses that were not corrected for aberrations. The resultant lenses were generally very wide-angle. The first of these was Thomas Sutton's (1819–1875) water-filled panoramic lens which was patented in 1859 and gave a field of view of around 60 degrees. More successful was the American optician C.C. Harrison's Globe lens, patented by Harrison and J. Schnitzer in 1860. The lens was made by a number of European manufacturers and remained popular throughout the century. Emil Busch's Pantoskop of 1865 was made in seven sizes. In the same year C.A. Steinheil patented the Periskop which was partly corrected although it did not become popular.

The next significant improvements in lens design were to take place from the 1880s.

MICHAEL PRITCHARD

See also: Dallmeyer, John Henry & Thomas Ross; Kodak; Bausch & Lomb; von Voigtländer, Baron Peter Wilhelm Friedrich; and Petzval, Josef Maximilian.

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LENSES: 3. 1890s–1900s

If the period of 1860–1880 was dominated by the rapid rectilinear lens, then the period 1880–1905 can be summed up with two designs, the anastigmats and the triplets.

The rapid rectilinear design had one major failing in that it suffered from anastigmatism. From 1884 new types of optical glass with high refractive indices which were being developed by Dr. Otto Schott of Jena. By 1886 his company, Abbe and Schott, had developed new glasses containing substances such as barium, and the new barium crown glass was incorporated into a number of lenses including Voigtländer's Euryscope lens of 1886. Barium glasses were to allow significant new lens designs to appear.

The first true anastigmat lens was designed by H.L. Schröeder and J. Stuart, and patented on 7 April 1888 (BP no. 5194). Schröeder was working for the Ross company that manufactured the lens as the Ross Concentric. It used barium crown glass and a new flint glass and it showed minimal signs of astigmatism or field curvature. The lens had an aperture of f/16 and was sold for many years.

In 1890 the German optician Dr. Paul Rudolph (1858–1935) designed a new lens for Carl Zeiss of Jena which offered a wider aperture and further corrections. It was an asymmetrical design also making use of barium glass. The lens was sold as the Anastigmat and from 1890–1893 various series of the lens were offered. With the loss of their rights on the name 'Anastigmat' the lens was renamed the Protar in 1900. The lens was made under license from Zeiss by Ross in London, Krauss in Paris, Bausch and Lomb in Rochester, and by others elsewhere. Sales of over 100,000 were claimed by 1900. A wide-angle version was still being sold in the 1930s. Zeiss's Double Protar lens, a convertible design, of 1895 offered the photographer a choice of three lenses in one.

Other companies were quick to introduce their own variant designs. In 1895 H.L. Aldis who was working for Dallmeyer designed the Stigmatic. Emil von Hoëgh's (1865–1915) patent of 1892 for a symmetrical lens was made as the Goerz Double Anastigmat and had an aperture of up to f/6.8. After 1904 this lens was known as the Dagor and remained popular well into the twentieth century. Von Hoëgh was made principal lens designer at Goerz.

The first wide-aperture anastigmat design was the Zeiss Planar of 1899 which had a maximum aperture of f/3.5.

The second significant lens design of the period was the triplet. On 25 November 1893 H.D. Taylor (1862–1943) was granted a patent for a triplet lens which consisted of three single spaced glasses. This was a significant departure from current lens designs. The lens was sold from 1893 by Taylor, Taylor and Hobson as the Cooke lens, the name in deference to Taylor's employers Thomas Cooke of York. The lens was simple and of low cost and with an aperture of f/6.3. In 1935 Taylor and Lee of Taylor, Taylor and Hobson claimed that "no fundamentally new principle of photographic lens design has been originated since Dennis Taylor invented this lens." The design was adapted by Voigtländer in 1900 for its Heliar design which was sold from 1902. The Ross Homocentric and Goerz Dogmar were similar triplet designs.

Rudolph at Zeiss further developed the Cooke design and in 1902 Zeiss introduced its most famous lens, the Tessar with an f/5.5 aperture. The Tessar was widely copied and appeared under such names as Ernon, Ektar Anticomar, Xtralux, and Lustrar from a large number of different manufacturers.

The first designs for a variable power telephoto lens—the forerunner of the modern varifocal zoom lens—also date from this period. This was developed independently by Dallmeyer in London, by Miethe in Germany and by Duboscq of France. It was patented on 15 December 1891 by Thomas Rudolf Dallmeyer (1859–1906) who had been running the Dallmeyer company since his father's death in 1883. In Germany Adolph Miethe (1862–1927) applied for a similar patent—leading inevitably to a dispute over precedence of similar magnitude to that which Dallmeyer's father had had with Steinheil in the 1860s. Dallmeyer produced a book *Telephotography* (1899) describing the use of his design.

A refinement of the lens was introduced in 1905 by K Martin and sold as the Busch Bis-Telar. This design overcame the limitations of Dallmeyer's original design and again was widely copied. Dallmeyer's own versions were sold as the Adon and Dallon and other companies sold under names such as Telestigmat, Telecentric, and Magnar.

Several other specific lens designs were developed during the period. Amongst them, a very wide-angle lens, the Hypergon, was made by Goerz and sold from 1900 and soft-focus lenses from Dallmeyer and Wollensak found favour with portrait photographers.

Michael Pritchard

See also: Dallmeyer, John Henry & Thomas Ross; Miethe, Adolf; and and Duboscq, Louis Jules.

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LEON, MOYSE & LÉVY, ISSAC; FERRIER, CLAUDE-MARIE; AND CHARLES SOULIER

The French photographic firm of Ferrier, Soulier, Lévy (FSL) produced a vast library of stereographic views in glass of mostly European monuments and sites during the second half of the nineteent century. In point of fact the FSL firm operated historically under eight names: (1) "Ferrier photographe," 1851–1859; (2) "Ferrier pere, fils et Soulier," 1859–1864; (3) "M. Léon et J. Lévy," 1864–1872; (4) "J. Lévy & Cie," 1872–1895; (5) "Lévy et ses Fils," or "Lévy Fils et Cie," 1895–1920; (6) "Lévy & Neurdein réunis," 1920–1932; (7) "Compagnie des Arts Photoméchaniques," 1932–1969; and (8) "Roger Viollet," 1969–present.

The phenomenon of binocular vision produced startling 3-D effects which still fascinate us today. Although FSL did from time to time produce paper stereographs, it was their superb glass stereographs which made the firm famous, and rich. Their views were universally regarded as the finest product of stereography. They produced a sense of depth that stunned first-time viewers, including Queen Victoria, at the Great Exhibition of 1851 in London. What set the glass stereograph apart from all other kinds of stereoviews—paper, tissue, daguerreotype—was the albumen-on-glass process, which offered a brilliant, very sharp, superbly contrasty and glistenningly transparent image. Viewed in direct light, it was incomparably superior to the paper stereograph, which like the stereo daguerreotype could only be viewed by reflected light.

Claude-Marie Ferrier (1811–1889) was the founder of FSL, and during the 1850s, while employed by maker of scientific instruments Jules Duboscq (1822–1894), he established the reputation of the glass stereographs. His stereographs measured 8.5 × 17 cm, the standard size for such views, whether paper, glass, or daguerreotype. These dimensions were imposed by the early stereo viewers, notably the Brewster stereoscope, which became the industry standard thanks to its enormous success at the Great Exhibition.

Claude-Marie Ferrier was born in Lyon in 1811. When he removed to Paris is unknown. The earliest mention of his work is in connection with the Great Exhibition in London of 1851, where he and Frédéric von Martens (ca. 1809–1875) produced photographic prints for Nicholas Henneman of objects figuring in the exhibition. Ferrier's photographs were printed on salted paper from albumen-on-glass negatives. The glass stereograph was "invented" at that same time, as Frederick Langenheim (1809–1879) later testified to Marcus Root: "While in Paris, in 1853, I was introduced to the celebrated optician, Dubosque-Soleil...In conversation, Mr. Dubosque told me that when he was engaged, in 1851, to arrange the display of his articles for the 'World's Fair' in London, he saw my photo magic lantern pictures, the first that he had ever seen, and thinking that such photo-positive pictures on glass might be used to supersede the daguerreotype pictures, until then manufactured for him by Mr. Ferrier, he had at once written to Mr. Ferrier, to come over to London to

Soulier, Charles. La Tour St. Jacques la Boucherie à Paris.
The Metropolitan Museum of Art, Edward Pearce Casey Fund, 1988 (1988.1072) Image © The Metropolitan Museum of Art.

examine my transparent positive pictures taken on glass, and that since then, they had tried and made such transparent positive pictures on glass for the stereoscope" (*The Magic Lantern*, 1874).

Ferrier produced superb sets of views of Paris and the Ile-de-France (1851–1853, nos.1–213), followed by views of England, the Loire Valley, Provence, the Cote-d'Azur, and Italy (1853–1854, nos. 273–599). During the period 1855–1857, additional series were produced: Switzerland (nos. 600–690), a second Italy series (nos. 700–778), Savoie (nos. 778–873), a second Swiss series (nos. 874–931). Views of Constantinople (nos. 950–1055) and Athens (nos. 1060–1095) were offered to the public as of June 13, 1857. Finally, Ferrier's early work was collected in a general catalogue published in 1859 (nos. 1–2399, with extensive numerical gaps). Various series had been offered previously in a half-dozen listings published mostly in stocklists: the Paris views in *Cosmos*, 1852; the English series in the Negretti & Zambra equipment stocklist of 1854; a long series in the London Stereoscopic Company stocklist of 1855/1856, appended to the Brewster treatise of 1856; the Gaudin catalogue of 1856; an advertisement in the journal *La Lumiere*, June 1857; and in the Langenheim/American Stereoscopic Company sales catalogue of 1858.

Late in 1859 Claude-Marie Ferrier, known as "Ferrier *pere*," formed a partnership with his son Jacques-Alexandre (1831–1912), known as "Ferrier *fils*," and Charles Soulier (before 1840–after 1876). This firm was known as "Ferrier pere, fils et Soulier." Charles Soulier had been in partnership since 1854 with Athanase Clouzard, and produced glass stereographs of very fine quality during that period. These often carry a "CS" signature. An important collection of approximately 1200 "CS" negatives came with Soulier to the new partnership with the Ferriers: a Russian series depicting monuments and sites in Moscow and St. Petersburg (nos. 5001–5191), and an extensive series of views, mostly taken by Soulier

in Paris, Germany, Austria, Spain, England and Scotland (nos. 6001–6997) . These "CS" views were incorporated into the FSL general catalogue of 1864, which was more than twice the length of that of 1859. The 1864 catalogue included most of the views first published in 1859, except for a few deletions, plus nos. 2401–6997.

The firm "Ferrier pere, fils et Soulier" was short-lived; in 1864 the Ferriers and Charles Soulier sold out to two of their employees, Moisé Léon and Isaac Georges Lévy (?–before 1895), known commercially as J. Lévy. Léon had formerly been in the silk ribbon business with Lévy at 243, rue Saint-Denis, in Paris, and was probably a silent partner in the new firm. Production of the highest quality of glass stereographs continued unabated, however. Another general catalogue was published in 1870 under the Léon and Lévy imprimatur, and included views from the first two general catalogues, plus nos. 7001-10027. The best known of the new collections of views was the series devoted to the Exhibition of 1867, issued both in glass and paper. Léon disappeared from the FSL firm in 1872, when the company assumed a new name: "J. Lévy & Cie." Lévy and later his sons ran the firm for almost a half-century, until its fusion with Neurdein in 1920.

In addition to the general catalogues of 1859, 1864 and 1870, three more general catalogues were published, in 1880, in 1886 and in 1903. The 1886 catalogue carried the numerical entries down to no. 12778; that of 1903 continued the numeration of views down to no. 27325. In between the general catalogues, thirty short stocklists of FSL glass stereoviews are known to have been published during the period 1859–1908. These latter listed the very latest additions to the stock of views available to customers. All of the FSL general catalogues after 1859 included the infilling of numerical series left empty in previous catalogues. For all practical purposes all FSL views produced after 1855 were numbered, and so their identification is simple. The effective date for each and every view is the date of the catalogue or stocklist in which the view first appears.

It would be fair to say that photographic excursions to distant sites to make negatives for full-sized glass stereographs (8 × 17 cm) had stopped by 1910, as the popularity of these larger glass views had begun to decline. Fortunately for the FSL firm their sales of magic lantern slides were substantial in Europe and the United States. The title page of the first general catalogue to mention magic lantern slides along with glass stereographs was the general catalogue of 1870. Lantern slides figure on the title pages of virtually all subsequent catalogues. The lantern slide was in effect one half of a glass stereograph. The importance of the lantern slide business explains why so many of the FSL glass stereo negatives still conserved at Roger Viollet in Paris have been cut in half; it was to simplify the printing of slides. Stereo halves were also used to produce paper prints, which are of course the mainstay of Roger-Viollet's business.

FSL enjoyed a reputation in the nineteenth century that far surpasses that of today. Their glass stereographs were universally admired as the finest produced in Europe. In Adolphe Joanne's *Le Guide Parisien* of 1863 FSL is singled out among photographic firms producing stereographs: "Let us mention especially the admirable collections of stereoscopic views in glass produced by Ferrier, pere, fils, et Soulier, at 113 boulevard de Sébastopol." The fact that the firm still exists, as Roger-Viollet, with its vast collection of FSL negatives substantially intact, makes it so much easier for us to assess the firm's substantial art-historical significance.

JOHN B. CAMERON

See also: Brewster, Sir David; Duboscq, Louis Jules; and Henneman, Nicolaas.

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LEUZINGER, GEORG (1813–1892)

Swiss photographer, printer, and engraver

Born in the Swiss canton of Glaris (Glarus) in 1813, Georg Leuzinger arrived in Rio de Janeiro in 1832. He originally sent daguerreotypes from Brazil to Paris to be colored by hand and printed as lithographs. By 1861 he had opened a photographic studio, Casa Leuzinger, which was also a printing and engraving firm. Marc Ferrez apprenticed there under Leuzinger's son-in-law, photographer Franz Keller. Leuzinger originally sold other photographers' work (e.g., Stahl, Klumb, Christiano Junior). Then in 1865, he published a catalogue of 400 photographs, including his own. Leuzinger's views of Rio and the surrounding region show a keen awareness of the artistic possibilities of landscape photography. He also produced intriguingly modern scientific images of plant life for the expedition led by naturalist Louis Agassiz in 1865, published in *Journey*

in Brazil in 1868. Leuzinger won silver medals at Brazilian exhibitions (1866 and 1873) and his works were shown at the International Exhibitions in Vienna (1873) and Antwerp (1885), and the Exposition Universelle in Paris (1867 and 1887), where his panoramic view of Rio taken from Cobras Island won honorable mention in 1867. Casa Leuzinger left the photography business in 1873 and its founder died in Rio in 1892.

SABRINA GLEDHILL

LEVITSKY, SERGEY LVOVICH (1819–1898)

Professional photographer

Sergey Lvovich Levitsky was born in Moscow in 1819 to a rich family. He was the cousin of Hertsen, the writer and outstanding public figure. He was born Lvov-Lvitsky but then changed his name to Levitsky. At his parent's request, Levitsky entered the school of law at Moscow State University, and graduated in 1839 becoming an official in the Ministry of Home affairs in St. Petersburg.

In 1843, Levitsky joined a research group commissioned to investigate the phenomenon of mineral springs in the Caucasus. During that period, he met U. Fritshe, an associate of the chemistry department at the Emperor's Academy of Sciences and the first Russian researcher dealing with the process of photography according to Talbot's technology. (Fritshe made his first photographs on the 23 May 1839). Levitsky having already bought a camera with a lens manufactured by French optician Chevalier, was interested in daguerreotype photography. On returning to St. Petersburg in 1844 Levitsky sent Chevalier his daguerreotypes with views of Pyatigorsk, Kislovodsk and other places in the Caucus. It was one of the first series of photographic landscapes taken in Russia. Later that year Levitsky retired and traveled abroad.

During Levitsky's visit to the Italian cities of Rome and Vena, he became acquainted with Senior Voigtlander and developed a friendship with him, eventually buying him a new lens for his camera. While in Rome, Levitsky took photographs of Russian painters and of the Russian writer Gogol, in Perro's studio, which is now believed to be the only portrait of this great personality.

In 1845, Levitsky took a course in chemistry and physics at the Sorbonne in Paris and met the leading daguerreotypists, including Daguerre, Charles Chevalier, Claude Félix Abel Niépce de Saint-Victor, and others. In 1849, Chevalier requested several large size daguerreotypes from Levitsky, who then when the works were finished, displayed them at an exhibition in Paris to illustrate how his lens contributed to the composition of photographs. The talent of Levitsky combined with Chevalier's innovative lens won them the gold medal at the exhibition.

Levitsky, Sergey Lvovich. Alexander Hertsen, 1861.
Private Collection: Alexei Loginov" Private Collection: Alexei Loginov.

After the French revolution of 1848, having lost most of his estate, Levitsky moved to St. Petersburg and established himself as a professional photographer. In October of 1849, he opened a studio on the Nevsky Prospekt, opposite the Kazansky Cathedral. According to his contemporaries, his studio was one of the most fashionable studios of the city and generated great popularity among the aristocracy, writers, and musicians. This was partly because Levitsky never stopped improving the technology of photography, and during the 1850s, he developed his use of wet collodion. His works never failed to demonstrate the highest level of technique and artistry.

During the middle of the nineteenth century, Levitsky became among the first photographers to start creating psychological photo-portraits, a prominent genre of portrait in Russia at this time. The Russian artists working with these types of portraits concentrated primarily on the personality and the spiritual life of the sitter. The artists believed it was possible to penetrate into the soul of a person and this belief founded itself not only in Russian painting, but in literature, music, theatre

and photography as well. During this period, due to the likeness between the two, photography was constantly compared to painting and therefore often said to copy it. It was from this that Levitsky developed his style to use the compositional laws of painting by employing soft light thus creating soft images. While creating artistic portraits, Levitsky successfully experimented with the pose of the model, thereby re-establishing the rules of the conventional studio portrait. Instead of employing the use of tasteless painted backgrounds and accessories, he spent more attention on the personality of the model.

In February of 1856 Levitsky made several personal, as well as group portraits of famous Russian writers such as L. Tolstoi, I. Turgjenjev, N. Ostrovsky, and others. He compiled these photographs, which effectively established the most impressive and comprehensive photographic gallery of Russian literary men, to the extent that in 1857, the limited edition of these photographs quickly sold out. Years later, these portraits were often and still are used to accompany the biographies of the writers. Levitsky's contemporaries have said that he captured the reflection of each of the writer's individuality and created cognizable psychological images. He also made a portrait of the Emperor Nikolai I, which became the best canonical portraits of the tzar.

In 1858 the photographer returned to Paris where he helped an American daguerreotypist, W. Thomson, with his work and later opened a studio of his own. In spite of the severe competition with the Parisian photographers, Levitsky enjoyed great popularity and success. A couple of highly successful works placed Levitsky among the leading portrait photographers of France. His portrait of Hertsen of 1861 was bootlegged in Russia and became a classical work of the world photographic portrait. In 1864 Levitsky made several portraits of the Emperor of France Napoleon III and his family and was thus honored with the title of "the emperor's photographer,"and was subsequently admitted into the Paris photographic society. Through his constantly successful innovations with photography, Levitsky became a well-known photographer, not only in Russia but also abroad and in 1865, Levitsky made a photo portrait of the Russian empress, the wife of Alexander II, and her elder son in Nice. The empress liked the photographs so much that she suggested that Levitsky return to St. Petersburg, which he later did.

Levitsky opened a studio with his son Lev in St. Petersburg and from 1866, and quite a long time after, he was the only photographer to take pictures of the emperor and his family. His photographs served as an archetype for painted portraits, sculptures, monuments and busts. In 1890 a special photo-studio with the "Emperor's Entry" was built where advanced technologies were used to take pictures of large groups of people in various lightings.

In 1866, Levitsky became a member of Russian Emperor Technical Society (RETS) and in 1878 was one of the founders of its photography department, making it RETS' fifth department. Levitsky was in constant demand, both in Russian and abroad, and was often given presents from royalty and persons of distinction. Due to his skill and experience, he was the expert at the Russian exhibitions and three international exhibitions. In 1873 he was an exponent of the first department of photography at the Londoner international exhibition. In 1889 he took part in an anniversary exhibition in St. Petersburg hors concours, impressing the visitors at the entry to the exhibition with a large half-length of the Emperor Alexander III made by himself.

In 1847 and 1856 he conducted experiments with taking pictures in arc light and in 1879 he demonstrated 20 successful portraits made in electric light, the first of its kind in Russia. This was extremely important to Russian photography since St. Petersburg's weather was usually poor and not conducive to taking pictures without using some type of light. Levitsky displayed several portraits made in electric light at an 1883 electro-technical exhibition in Vena.

The last few years of his life Levitsky was severely ill and died in St. Petersburg in 1898. At a conversazione dedicated to the 74th anniversary of photography, the great connoisseur of photography, professor V. Sreznevsky, described Levitsky as "the farther of Russian photography, who began by creating daguerreotype works in St. Petersburg and who then raised portrait photography to the highest level of technical and artistic perfection." He was often known as the patriarch of the Russian photography. After his death the photo-studio was run by his son Lev until 1913.

ALEXEI LOGINOV

Biography

Sergey Lvovich Levitsky was born in Moscow in 1819. He graduated from the School of Law at Moscow State University in 1839 and became an official in the Ministry of Home Affairs in St. Petersburg. His first photographs were made in 1843 during his stay in the Caucasus. In 1844 he retired and left for Europe. He studied photography in Paris and in 1849 returned to St. Petersburg. From 1849 to 1858 he worked at his photo-studio and made a series of portraits of Russian writers. He worked on improving the technique of photography. In 1858 he moved to Paris and opened a studio. While in Europe, he made a photograph of the emperor Napoleon III and his family and became "the emperor's photographer." In 1865 Levitsky returned to St. Petersburg and worked there together with his son Lev. Through his ingenuity and experimentation with technique, Levitsky became one of the leading

portrait photographers of Russia. Levitsky died in St. Petersburg in 1898.

See also: Niépce de Saint-Victor, Claude Félix Abel; Daguerre, Louis-Jacques-Mandé; Chevalier, Vincent & Charles Louis; and Daguerreotype.

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THE LIBRARY OF CONGRESS

Established as a legislative resource for Congressional members, the Library of Congress is America's oldest cultural and research institution. With a current budget of more than $330 million, a staff of 5,000, and collections totaling more than 100 million items, the Library has grown to become one of the leading cultural institutions in the world.

The Library of Congress was founded on April 24, 1800, when President John Adams approved legislation for the purchase of "such books as may be necessary for the use of Congress." The original collection of 740 volumes and three maps arrived from London in 1801 and were stored in the U.S. Capitol in the newly created capital city of Washington, D.C.

On January 26, 1802, Thomas Jefferson signed the first law that established regulations and a budget for a Congressional library. He believed that successful self-government depended on an informed public; his faith in democracy rose from his demand for intellectual freedom. President from 1801 to 1809, Jefferson appointed the first two Librarians of Congress and recommended books for the collection. During the Revolutionary War in 1814, the British army invaded Washington and burned the Capitol, including the Library of Congress, which had grown to 3,000 volumes. Although Jefferson called himself a man who could not live without books, he sold his personal library to Congress to replace the lost collection. At 6,487 volumes, his library contained more than twice the number of books destroyed in the fire.

Today the Library comprises three buildings in Washington, D.C., near the U.S. Capitol. The Jefferson Building opened in 1897; the Adams Building opened in 1939; and the Madison Building, the largest of the three and home to the graphics arts collections, opened in 1980. Treasures in the collections include one of only three perfect vellum copies of the Gutenberg Bible, printed around 1456; the original Declaration of Independence, drafted in 1776; and the Constitution of the United States, framed in 1787 by the Constitutional Convention.

The collections expanded rapidly after 1846, when the practice of depositing items into libraries for copyright protection was established. The copyright law of 1870 required that two copies of every creative work, including books, maps, prints, photographs, and pieces of music, to be registered for copyright must be deposited in the Library of Congress. However, the Library is not required to retain all copyright deposits, and except for the period from 1870 until 1909, it was never one of the Library's objectives. As a result, contrary to popular belief, the Library does not own a copy of every book published in the United States.

In 1866 the entire Smithsonian Institution library was transferred to the Library of Congress, firmly establishing the Library as the sole national library. Especially strong in scientific materials, the Smithsonian collection rounded out the Library's already broad scope encompassing works on the arts, literature, law, geography, history, and Americana.

Special services include a program of daily readings for the blind, initiated in 1897. In 1913 Congress directed the American Printing House for the Blind to begin depositing embossed books in the Library, and in 1931 a separate appropriation was authorized for providing books for the blind. The Library of Congress Trust Fund Board Act of 1925 allowed the Library to accept private funding, which enabled the Library to support the commissioning of new works of music and to establish chairs and consultantships for scholars. The consultantship for poetry has evolved into the position of U.S. Poet Laureate.

When Mathew Brady organized a team of photographers to compile a visual record of the Civil War in the 1860s, two copies of the photographs deposited in the Library formed the incipient photography collection. An additional 300 daguerreotype portraits of prominent Americans made by Brady were transferred to the Library from the U.S. Army War College in 1920; thousands of his negatives and plates were donated by the family of Brady's nephew in 1954. Other significant contributions to the photography archive include the 1943 acquisition of Arnold Genthe's work, which contains photographs from San Francisco's Chinatown and portraits of author Pearl S. Buck and other prominent society members; and the 1949 donation of more than 300 glass plate negatives documenting the aviation successes and failures of Orville and Wilbur Wright.

The Prints and Photographs Division has grown to be among the world's largest, with more than 100,000

engravings, lithographs, woodcuts, and other graphic arts and 13 million photographs. Unique items in the collection include a volume of daguerreotype landscapes from around the world, transferred onto copper plates and printed by letterpress. The George S. Lawrence and Thomas Houseworth Collection contains mid-nineteenth century gold-toned stereographic photographs of California and Nevada. In 1893 the Library acquired its first motion picture when W.K.L Dixon deposited *Edison Kinetoscopic Records* for copyright. In 1968 the American Film Institute formalized an agreement with the Library to develop a national motion picture collection.

Special collections within the Photographs Division include the photoprints and negatives from the Detroit Publishing Company, which was formed in 1898 (and later renamed the Detroit Photographic Company) as a partnership between printer William A. Livingstone and photographer William Henry Jackson. Livingstone owned the American rights to a lithographic process that added color to black-and-white negatives and collaborated with Jackson and other photographers to produce thousands of postcards and souvenirs, primarily of the United States.

The Farm Security Administration, headed by Roy E. Stryer, commissioned photographers Walker Evans, Dorothea Lange, Russell Lee, Arthur Rothstein, Ben Shahn, Jack Delano, Marion Post Wolcott, Gordon Parks, and others to document American life between 1935 and 1943. The project focused on Southern sharecroppers and migratory agricultural workers in the Midwest and West. Transferred to the Library in 1944, the holding includes the archives of Walker Evans and Dorothea Lange, in addition to photographs made for other government agencies, such as the Office of War Information.

Contemporary photographic holdings are diverse. In 1970 Toni Frissell donated negatives and photographs from forty years as a fashion and portrait photographer. The Library's collection includes Frissell's informal portraits of Winston Churchill, Elearnor Roosevelt, and John and Jacqueline Kennedy, as well as scenes from Washington, D.C. and Europe during World Was II. The Erwin E. Smith Collection comprises portraits of American cowboys made between 1905–1915 on ranches in Texas, New Mexico, and Arizona.

The Prints & Photographs Online Catalog provides computer access to a cross-section of the Library's visual material. Material not available online can be viewed in the Prints & Photographs Reading Room in the Library's Madison Building. Much of the material held by the Library is exhibited on site; some material is available for exhibition loan. The Library also provides reference and research services.

RENATA GOLDEN

See also: Brady, Mathew B.; and War Phtography.

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LICHTWARK, ALFRED (1852–1914)

German photographer

Alfred Lichtwark was born November14, 1852, in Reitbrock near Hamburg as the eldest son of a poor miller. In 1860 the family moved to Altona where Alfred visited a school for the poor and worked subsequently as a teacher and librarian. In 1886 he was installed as managing director to the Kunsthalle (art hall) at Hamburg founded in 1846. Until his death on November13, 1914, Lichtwark presided the museum and bought a vast number of items for its collections: 1137 paintings, pastels, and watercolours, 890 sculptures, reliefs, and coins, 22,476 graphic prints and drawings, 8004 books, and 14,367 photographs.

Early in 1893, Alfred Lichtwark installed the first large show of the fine art photography movement on German ground, which was seen by more than 13,000 visitors in 51 days. This show started the career of the Viennese Trifolium (Hugo Henneberg, Heinrich Kühn, Hans Watzek), and instigated a number of similar exhibitions. Alfred Lichtwark published article after atricle on the pedagogic benefits of amateur photography, held lecture after lecture on the importance of collecting photographs, and by the end of the 19th century had managed to establish the German definition of the "engaged amateur." There has been no better mediator of the Art in Photography in German language since Alfred Lichtwark.

ROLF SACHSSE

LIÉBERT, ALPHONSE JUSTIN (1827–1913)

Born in 1827, Alphonse Justin Liébert began his career as a naval officer until he resigned to become photographer. In 1851, he opened a studio in the United States, in San Francisco, where he stayed twelve years long. Back in Paris, he promptly engaged in the French

photographic background until he joined in the Société française de photographie, 1873 in the hope of improving his technique.

He brought back from the United States the use of the melainotype process and was one of the first who used the carbon printing: he published many treatises on this subject.

Liébert also patented (1873) his own enlarger and invented a kind of color tint to put on pictures (1894); he also operated a sensitized paper factory between 1895 and 1900. Finally, he proposed the first studio equipped with the electric light (1879) and realized photographs of the Expositions universelles balloon (1889).

Moreover, Alphonse Liébert is known as one of those who recorded and photographed the events of the Paris Commune in 1870.

After his death, in February 1913, his son Georges Auguste Liébert continued his work in the studio.

MARION PERCEVAL

LIGHT-SENSITIVE CHEMICALS

Light, as a form of energy, has the power to promote chemical change. Of the many photochemical reactions, the few that are suited to making permanent photographic images employ light-sensitive salts of the metals silver, iron, uranium, and chromium, and some purely organic substances.

Silver halides were essential to the first 150 years of camera photography owing to their unique ability to capture an image "instantaneously." No other substance matches their unparalleled sensitivity, which depends on the formation of an invisible latent image, and its subsequent development, whereby the action of light is amplified enormously—a few hundredfold in the earliest development processes discovered by Henry Talbot and Louis Daguerre; but about ten million times in modern emulsions. All other photosensitive substances provide little or no amplification, and have no practical use in the camera, only for making positive prints or photograms, where intense illumination and lengthy exposures are no disadvantage.

Light of shorter wavelengths has greater intrinsic energy; the portion of the prismatic spectrum most effective photochemically is therefore the blue and ultraviolet—the "actinic" radiation discovered photographically by Johann Ritter in 1801. Photography usually entails the promotion by light of a chemical reduction of metal cations (positively-charged metal atoms) which take up, and are neutralized by the negatively-charged electrons supplied by an oxidisable substance, to form the elemental metal. Description of these photochemical reduction-oxidation reactions by traditional, balanced chemical equations tends to obscure the essence of the process, so this account will use ionic "half-reactions" explicitly involving the transfer of electrons, represented as e^-. The half-reactions are then combined proportionally to balance out the electrons in the overall equation.

Silver

Silver chloride was discovered in 1565 by Georg Fabricius in the mines of Bohemia, as the mineral "horn-silver" or *luna cornua*. By the 17th century, it was known to darken in sunlight; in 1614, Angelo Sala observed the same behaviour in silver nitrate (the *lapis lunearis* of the alchemists) when in contact with organic matter. Johann Heinrich Schulze was the first to demonstrate a primitive photographic effect in silver salts in 1725, and Carl Wilhelm Scheele showed in 1777 that the violet rays of the spectrum were most effective in decomposing silver chloride, and that the dark product was finely-divided silver. Knowledge of the light-sensitivity of the other silver halides had to await the discoveries of the parent halogens, bromine (by Antoine Balard, 1826), and iodine (by Bernard Courtois, 1811). In the following equations, X represents any of these, i.e., Cl, Br, or I:

$\text{Light} + X^- \rightarrow X + e^-$
Halide anion → halogen atom + electron
$Ag^+ + e^- \rightarrow Ag$
Silver cation + electron → silver metal
$X + X \rightarrow X_2$
Halogen atoms → halogen molecule

The overall net reaction is:

$\text{Light} + AgX \rightarrow Ag + {}^1/_2X_2$
silver halide → silver metal + halogen molecule

To prevent the reversal of this reaction and destruction of the image silver, a halogen absorber should be present: sodium citrate is used in many Printing-out papers. This process is discussed further under the entries for Photogenic drawing negative and Salted paper print. The chemistry of Development is described under Calotype or Talbotype. Pure silver halides react chiefly to blue and ultraviolet light. To render a balance of tones, negative emulsions must respond to the entire visible spectrum, which was achieved by Hermann Wilhelm Vogel's introduction of sensitizing dyes in 1873, extending the response to green light (orthochromatic plates), and eventually in 1904 to red wavelengths (panchromatic plates).

Iron

Many salts of iron(III) with organic acids are photosensitive; Johann Döbereiner first observed in 1831 that a green solution of iron(III) oxalate in sunlight

precipitates yellow insoluble iron(II) oxalate, evolving carbon dioxide gas:

UV light + $Fe_2(C_2O_4)_3 \rightarrow 2FeC_2O_4 + 2CO_2$
iron(III) oxalate → iron(II) oxalate + carbon dioxide

This equation is the sum of two half-reactions, involving the transfer of electrons from the oxalate anion to reduce the iron(III) cation:

$C_2O_4^{2-} \rightarrow 2CO_2 + 2e^-$
$Fe^{3+} + e^- \rightarrow Fe^{2+}$

Iron(II) oxalate is too feebly coloured to constitute a satisfactory image, so a second reaction must be employed to make a permanent print, either by reducing a noble metal salt to the metal, such as silver, gold, palladium or platinum, or by forming a pigment such as Prussian blue, or ferrogallic ink.

In 1842, Sir John Herschel was the first to use iron(III) salts photographically, as the commercially-available ammonium iron(III) citrate or tartrate; the photochemistry is more complex than the oxalate, but the same principle of reduction of iron(III) to iron (II) applies. As iron(III) carboxylates are sensitive only to the ultraviolet and blue-green portions of the spectrum, they had to be exposed to daylight or sunlight in the nineteenth century.

Uranium

Light sensitivity in uranium salts was noted by Adolph Gehlen in 1804, and first used for photographic processes by Charles Burnett in 1855. Salts of uranium(VI), such as uranyl nitrate $UO_2(NO_3)_2$, (once called "uranic" salts) can be photochemically reduced on paper to uranium(IV) (once called "uranous"):

UV light + $UO_2^{2+} + 2e^- + 4H^+ \rightarrow U^{4+} + 2H_2O$
Uranyl cation + electrons + hydrogen ions → uranium(IV) cation + water

This lower oxidation state of uranium can then reduce a noble metal salt to form the metal image of silver:

$U^{4+} + 2Ag^+ + 2H_2O \rightarrow UO_2^{2+} + 2Ag + 4H^+$
palladium:
$U^{4+} + PdCl_4^{2-} + 2H_2O \rightarrow UO_2^{2+} + Pd + 4HCl$
or gold:
$3U^{4+} + 2AuCl_4^- + 6H_2O \rightarrow 3UO_2^{2+} + 2Au + 4H^+ + 8HCl$

Alternatively, the uranium(IV) cation can be reacted with potassium ferricyanide to form the stable red pigment, uranyl ferrocyanide $(UO_2)_2[Fe(CN)_6]$, in the Uranotype process, analogous to the Cyanotype. Owing to its toxic and radiological hazards, uranium is no longer employed in photography, but it did enjoy a passing significance in the nineteenth century.

Chromium

Dichromates were discovered by Vauquelin in 1797 and used for tanning leather, before Mungo Ponton discovered in 1839 that papers coated with them changed colour on exposure to light, so launching this method of photographic imaging. The yellow-orange dichromate can oxidise many organic substances; the chromium(VI) is itself reduced to the state of blue-green chromium(III) ultimately (passing through brown intermediates of uncertain identity, possibly chromium(IV) dioxide, CrO_2). Acidic conditions are needed for the reduction half-reaction:

$Cr_2O_7^{2-} + 14H^+ + 6e^- \rightarrow 2Cr(H_2O)_6^{3+} + H_2O$
Dichromate + hydrogen ions + electrons → hexaquachromium(III) cations + water

Light stimulates dichromate to oxidise organic matter in a number of ways, for example, oxidising a primary alcohol group (present in cellulose) to an aldehyde:

$RCH_2OH \rightarrow RCHO + 2e^- + 2H^+$
Alcohol → aldehyde + electrons + hydrogen ions
So a typical overall reaction would be:
UV light + $Cr_2O_7^{2-} + 3RCH_2OH + 8H^+ \rightarrow 3RCHO + 2Cr(H_2O)_6^{3+} + H_2O$
Dichromate + alcohol + hydrogen ions → aldehyde + hexaquachromium(III) + water

The product hexaquachromium(III) cation, $Cr(H_2O)_6^{3+}$, is capable of hardening (i.e. rendering insoluble) many macromolecular colloids that are normally soluble in water: either proteins such as gelatin, casein, and animal or fish glues, or carbohydrates such as starch or plant gums. This hardening is believed to result from the chromium(III) complex forming cross-links between the long organic chains to create a net-like molecular structure which is no longer soluble: carbohydrates bind to chromium(III) via their hydroxyl (–OH) groups, and proteins via their amino (–NH–) groups. The hardened colloid then acts as a vehicle to bind a pigment image in the Carbon and Gum bichromate processes, or as an etching resist in the Photomechanical processes.

Organic Substances

The "Heliographic" process of Nicéphore Niépce entails the light-induced hardening of bitumen, which becomes insoluble in lavender oil and petroleum. Bitumen has a complex and varied structure of polycyclic aromatic hydrocarbons (linked benzene rings), containing a small proportion of nitrogen and sulphur; its hardening is undoubtedly due to further cross-linking, as is the hardening of tree resins (colophony, or abietic acid) by light, first observed by Jean Sénébier in 1782. The photochemistry of these processes, which have been studied by Marignier in the 1990s, remains rather obscure.

Extracts of many plant dyes are fugitive colours and fade within hours or days of exposure to sunlight. They provided Sir John Herschel with his unfixable Anthotype process. A more permanent, positive-working organic photochemical process results from the decomposition of diazonium salts by light:

$$UV\ light + C_6H_5N_2^+\ Cl^- + H_2O \rightarrow C_6H_5OH + N_2 + HCl$$

phenyl diazonium chloride + water → phenol + nitrogen + hydrogen chloride

The diazonium salt that remains can couple with phenolic molecules to produce azo-dyes in a variety of colours, e.g.:

$$C_6H_5N_2^+ + C_{10}H_7OH \rightarrow C_6H_5N{=}N\ C_{10}H_6OH + H^+$$

Phenyl + ß-naphthol → benzene-azo-ß-naphthol + hydrogen ion

diazonium cation (a red dyestuff—Sudan I)

This reaction forms the basis of the Primuline and Diazotype processes.

MIKE WARE

See also: Salted Paper Print; Calotype and Talbotype; Photogenic Drawing Negative; Platinum Print; Positives: minor processes; and Cyanotype.

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LINDSAY, SIR COUTTS (1824–1913)

English painter and photographer

Sir Coutts Lindsay, painter and founder of the Grosvenor Gallery, was born in 1824 on the outskirts of London, the son of Colonel James Lindsay and Anne, both of whom were interested in the arts. After a stint in the army, Lindsay studied painting in the 1840s and early 1850s and exhibited paintings at the Royal Academy in the 1860s. He married Caroline Blanche Fitzroy in 1864. He took up photography at some point in the late 1840s or 1850s and made salted paper prints. His subjects mostly consisted of landscapes and architecture, particularly views of Italy. Examples of work attributed to Lindsay are in the collection of the Getty Museum and the Harry Ransom Humanities Center at the University of Texas, Austin. He was also photographed by David Wilkie Wynfield and Julia Margaret Cameron in the 1860s. Lindsay is most well-known for founding the Grosvenor Gallery in 1877, which for a number of years rivaled the Royal Academy as the most important exhibition venue for British artists. Lindsay died in 1913.

DIANE WAGGONER

LINDT, JOHN WILLIAM (1845–1926)

One of Australia's pre-eminent photographers, John Lindt produced a large volume of high quality photography, remarkable for its thematic range, aesthetic consistency and technical accomplishment. His pursuit of landscape and ethnographic subjects, coupled with a rare entrepreneurial flare, continued throughout a half century career. During his early Grafton years, from 1869–1876, Lindt produced a number of significant photographic portfolios, including *Australian Aboriginals* (c.1873–1874); *Australian Types* (c.1873–1874); and *Characteristic Australian Scenery* (1875). The latter series, commissioned by the New South Wales Government for the 1876 Philadelphia Centennial Exhibition, contains images such as *The Artist's Camp (Near Wintervale)* (1875) (Grafton Regional Gallery), and *Tower Hill Creek, N.S.W.* (1875) (National Library of Australia) which demonstrate Lindt's exceptional compositional ability and meticulous attention to exposure and printing technique, qualities apparent in much of his later work.

Strikingly, these early portfolios indicate Lindt's emblematic cast of mind to work ambitiously within defined pictorial categories. Like his contemporary and friend, Nicholas Caire (1837–1918), Lindt produced photographs with one eye firmly focused on the burgeoning national and international markets for such productions. When Lindt's *Australian Aboriginals* was marketed in late 1874, it was considered "the first

successful attempt at representing the native blacks truthfully as well as artistically" (Kerr, 1992, 475). The N.S.W. Government purchased albums for presentation to scientific institutions in England, and via an established international network of collecting agencies these photographs became the most widely distributed images of Aboriginal people in the late nineteenth century (Orchard, 1999, 163–70). The artificiality of the studio tableaux adopted by Lindt, which convey a poignancy of loss and displacement of his Gumbaynggirr and Bundjalung subjects probably not intended by the photographer, has been discussed elsewhere (Jones, 1985; Poignant, 1992; Annear, 1997; Orchard, 1999).

Lindt moved to Melbourne in 1876, established a new studio in 1877, and embarked on a series of landscape portfolios, including *Fernshaw and Watts River Scenery, Victoria* (c.1878–82), *Scenery on the Ovens and Buckland Rivers, Victoria* (c.1878–82), and *Lorne, Louttit Bay, and Cape Otway Ranges* (1883). He also made an extensive record of Melbourne public buildings and streetscapes. In June 1880 Lindt was commissioned by a Melbourne newspaper to travel to Glenrowan, Victoria to document the capture of the notorious bush-rangers, the Kelly gang. Arriving in the aftermath, Lindt produced one of his most memorable wet plate images, *Body of Joe Byrne, member of the Kelly gang, hung up for photography, Benalla*, 1880 (National Gallery of Australia). It has been acclaimed as one of Australia's first press photographs (Newton, 1988, 44). In the same year Lindt commenced his use of the recently introduced dry plate negative process—he received the first consignment to arrive in Melbourne—and from 1884 operated a second studio installed behind his newly acquired estate, "Ethelred," to service demand for his work. Sales of his Blacks' Spur scenery amounted to approximately 25,000 copies printed from the original negatives between 1882 and 1892 (Lindt, 1920, 3).

From 1869 Lindt imported quality photographic equipment and supplies direct from Germany and from about 1881 he was using recently introduced Voigtländer Euryscope lenses in the field and in the studio to produce enlargements. At this time he also became the sole agent for numerous studio supplies, including Haake & Albers' studio cameras, and Enholtz's scenic backgrounds.

In 1885 he travelled to the newly proclaimed Protectorate of British New Guinea, collecting native artifacts and producing several hundred dry plate negatives of tribal life and village scenes. A selection of fifty of these illustrated his *Picturesque New Guinea*, produced using a new autotype process. In 1888 The Argus commented on exceptional quality of Lindt's New Guinea photographs with directness: "It has often been a matter of discussion how far, or whether at all, photography may be considered a fine art. By the work of J. W. Lindt this question is decided in a way that is a triumph for his profession" (*The Argus* 27 November, 1888). In 1889 Lindt moved studio to 177 Collins Street and was commissioned by the Victorian Government to document the fledgling irrigation settlement of Mildura, in north-west Victoria. Here he produced a variety of scenes, many of which are imbued with a sense of occasion and civic optimism associated with this pioneer venture.

Under the auspices of the Royal Geographical Society (R.G.S.), Lindt made further expeditions, to the New Hebrides (1890), and to Fiji (1891), the latter trip resulting in the production of a series of outstanding autotype enlargements of a fire-walking ceremony. Some of these were first published as plates in the *Transactions of the R.G.S.* (Lindt 1894, 45–58), but plans to produce a volume along the lines of *Picturesque New Guinea* were not realized due to the severe recession of the mid 1890s. One of his last ethnographic portfolios, of named members of a touring Northern Australian Aboriginal performing troupe, was produced in an indoor studio setting in 1893.

Lindt closed his Melbourne studios and removed to "The Hermitage," at Black Spur, north-east from Melbourne in 1894. Here he continued to produce works of exceptional quality, such as *Snow at the Hermitage* (c.1905) (State Library of Victoria), and kept up with the latest international developments. He became a role model for the rising generation of pictorialist photographers. In 1924, a print of Lindt's dramatic, *The Hermitage, Blacks' Spur* (c.1912) (State Library of New South Wales), taken from one of the tree-houses in "The Hermitage" garden, was given to Harold Cazneaux (1878–1953), later recognized as one of Australia's outstanding pictorialists. In 1925 it was reported that Lindt "continues to produce remarkable and most artistic pictures of the beauties of mountain landscape. He is not a believer in the blurred effects favored by many… instead he is a master of detail" (*The Argus*, 19 March 1925). Lindt died of heart failure, on Black Friday 19 February, 1926, at the height of severe bush-fires which destroyed much of the Blacks' Spur Mountain Ash forest. "The Hermitage" and a substantial body of his work survives, most significantly in the collections of the State Library of Victoria, Melbourne. Other holdings include the State Library of New South Wales, Sydney; National Gallery of Australia, Canberra; National Library of Australia, Canberra; Clarence River Historical Society, Grafton; and Grafton Regional Gallery. Further global holdings are listed in (Orchard 1999).

KEN ORCHARD

Biography

John William Lindt was born 1 January 1845 in Frankfurt-Main, Germany, the son of Peter Joseph Lindt, a

customs officer, and Justine, née Rambach. He arrived in Melbourne, Victoria, in 1862, and settled in Grafton, New South Wales in 1863. He assisted photographer Conrad Wagner (c.1818–1910) until 1869, when Lindt took over management. Lindt married Wagner's daughter, Anna on 13 January, 1872 and opened a new studio in March 1873. He moved to Melbourne in 1876 and established studios at 7 Collins St. East, Melbourne in 1877. In 1884 he moved to "Ethelred," Hawthorn, from where he operated a second studio. Lindt made three South Pacific ethno-photographic expeditions, travelling to New Guinea (1885), the New Hebrides (1890) and Fiji (1891). Lindt was made a Fellow of the Royal Geographic Society of Australasia in 1887, and judged the 1887 General International Photographic Exhibition, Frankfurt-Main. Following the death of his wife, on 27 May, 1888, Lindt was appointed Honorary Commissioner—British New Guinea Court at the Melbourne Centennial Exhibition, 1888. He married, Catherine Cousens in July, 1889. Lindt closed his Melbourne studio in 1894, and established "The Hermitage," a mountain resort at Blacks' Spur, Victoria. He lived there until his death on 19 February, 1926.

Awards include; Brisbane, 1876; New South Wales Academy of the Arts, Sydney, 1876; Philadelphia Centennial Exhibition, 1876; Paris, 1878; Sandhurst, 1879; Christchurch, 1882; Melbourne, 1880; Amsterdam, 1883; Calcutta, 1884; Frankfurt-Main, 1885; Melbourne Centennial Exhibition, 1888; World's Columbian Exhibition, Chicago, 1893. His publications include: *A Few Results of Modern Photography* (Melbourne, 1886); *Apparatus, Chemicals and Requisites for Modern Photography* (Melbourne, 1886); *Picturesque New Guinea* (London, 1887); "Ascent of the Tanna volcano and a tour through the New Hebrides group," in *Transactions* of the Royal Geographical Society of Australasia (Victorian Branch), Vol. 8, No. 2 (Melbourne, 1891); "The Resources and Capabilites of the New Hebrides," in *Transactions,* Vol. 10, (Melbourne, 1893); "The Fire Ordeal at Beqa, Fiji Islands," in *Transactions*, Vol. 11 (Melbourne, 1894); *Companion Guide to Healesville, Blacks' Spur, Narbethong, and Marysville* (co-published with Nicholas Caire, Melbourne, 1904, reprinted 1912–13, 1916–17); and *A Tale About a Wayside Inn* (1920).

See also: Royal Geographical Society; Dry Plate Negatives: Non-Gelatine, Including Dry Collodion; and Pictorialists.

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LION, JULES (c. 1816–1866)

American daguerreotypist

Jules Lion, also sometimes spelled as Lyons, is the earliest known African American daguerreian artist in the United States. He was also the first daguerreian artist in New Orleans.

Born in Paris around 1816, Lion was listed as a painter in New Orleans as early as 1837. News of the daguerreotype process reached New Orleans on Oct. 1, 1839, with the publication of an article in the New Orleans Bee. Within six months, in March 1840, Lion was exhibiting daguerreotypes he had made, including images of local buildings. He also demonstrated the daguerreotype process. He may have been assisted in his early experiments by his brother Achille, a dentist.

Although no documentation exists to confirm it, Lion may have influenced the renowned southern photographer George S. Cook, as Cook was a painter in New Orleans at the time and learned the daguerreotype process in the city.

Lion maintained daguerreotype studios at several locations on Royal and Charles Streets in New Orleans from 1840 to 1844. In 1843 he began offering hand-colored daguerreotypes, but a year later largely abandoned the photography business in favor of painting and

lithography. In 1848, Lion opened an art school in New Orleans and in 1865, a year before his death, he became professor of drawing at Louisiana College.

BOB ZELLER

LIPPMANN, GABRIEL JONAS (1845–1921)

French scientist and physicist

Lippmann who was born in 1845 is known for many fundamental contributions in several scientific fields: electricity, thermodynamics, optics, photography, and photochemistry. He became interested in the theory of light and, in particular, color theory. As early as 1886, he had developed a general theory of recording colors as standing waves in a light sensitive emulsion. However, most of his time was devoted to perfecting a suitable recording emulsion for his experiments. The first plates that Lippmann used were albumen emulsions containing potassium bromide. The plates were sensitized in a silver bath, washed, flowed with cyanine solution and dried. The sensitivity was extremely low. On February 2, 1891, Lippmann announced at the Academy of Sciences in Paris that he had succeeded in recording a true-color spectrum which was permanent. A little more than one year later, on April 25, 1892, Lippmann gave a second presentation at the Academy of Sciences. This time he displayed four color photographs of different objects. Later he was able to record a landscape with a grey building surrounded with green foliage and blue sky. The size of his early photographs was 4 cm by 4 cm and later 6.5 cm by 9 cm. Lippmann developed the first theory of recording monochromatic and polychromatic spectra in a panchromatic b/w emulsion. He applied Fourier mathematics to optics, which was a new approach at that time. His color photography technique is known as *Interferential Photography* or *Interference Color Photography*, however most often referred to as *Lippmann Photography*.

The principle of Lippmann photography is clear. Because of the demand for high resolving power in making Lippmann photographs, the material had to be a very fine-grain emulsion and, thus, of very low sensitivity. The coating of emulsion on Lippmann plates was brought in contact with a highly reflective surface, mercury, reflecting the light into the emulsion and then interfering with the light coming from the other side of the emulsion. The standing waves of the interfering light produced a very fine fringe pattern throughout the emulsion with a periodic spacing of $\lambda/(2n)$ that had to be recorded (λ is the wavelength of light in air and n is the refractive index of the emulsion). The color information was stored locally in this way. The larger the separation between the fringes, the longer was the wavelength of the recorded part of image information. When the developed photograph was viewed in white light, different parts of the recorded image produced different colors. This was due to the separation of the recorded fringes in the emulsion. The light was reflected from the fringes, creating different colors corresponding to the original ones that had produced them during the recording. It is obvious that there was a high demand on the resolving power in order to record the fringes separated in the order of half the wavelength of the light. It was also clear that the processing of these plates was critically important, as one was not allowed to change the separation between the fringes because that would create wrong colors. In order to observe the correct colors in a Lippmann photograph, the illumination and observation have to be at normal incidence. If the angle changes, the colors of the image will change. This change of color with angle is called iridescence and is of the same type as found in peacock feathers and mother of pearl.

Soon after Lippmann had introduced his technique several scientists and researchers began to explore and further develop this new color photography technique. Auguste and Louis Lumière produced a special ultra-fine-grain silver halide recording emulsion which had a much higher sensitivity than Lippmann's first emulsion. With the new emulsion Louis Lumière was able to recorded the first color portrait in 1893. In Germany Richard Neuhauss and Hans Lehmann contributed extensively to the development of Lippmann photography and both recorded excellent color photographs at the end of the 19th century.

Although Lippmann photography is extremely interesting from a scientific point of view, it was not very effective for color photography since the technique was complicated and the exposure times were too long for practical use. The difficulty in viewing the photographs was another contributing factor, in addition to the copying problem, which prevented Lippmann photography from becoming a practical photographic color-recording method. However, one-hundred-year-old Lippmann photographs are very beautiful and the fact that the colors are so well preserved indicates something about their archival properties. Still today, it is the only photographic technique that can record the entire color spectrum of a scene, rendering extremely realistic e.g., human skin and metallic reflections. When the Lumière brothers introduced the more practical *Autochrome* color process in 1907, the interest in Lippmann photography disappeared. However, in the late 1990s, a new interest in Lippmann's technology has been manifested by newly recorded Lippmann photographs (without the need for mercury) as well as several recent publications on interference color photography.

HANS I. BJELKHAGEN

Biography

Gabriel Jonas Lippmann was born on August 16, 1845, in Hollerich, Luxembourg, of French parents. The family moved to Paris and in 1858 he entered the Lycée Napoleon and ten years later École Normale. Lippmann studied also in Germany, with Helmholtz in Berlin and with Kirchoff in Heidelberg where he received the degree of Doctor of Philosophy in 1873. In Heidelberg he studied the relationship between electricity and capillary phenomena which led to the development of his capillary electrometer. In 1875 he moved to Paris and later became a professor of Mathematical Physics at the Sorbonne in 1883 and member of the Institute in 1886. At the Sorbonne he was teaching acoustics and optics. There he invented color photography and developed it during ten years. Lippmann became a member of the French Academy of Sciences in 1883 and its president in 1912. He was a member of the Bureau des Longitudes and a Foreign Member of the Royal Society in London. In 1908 Lippmann was awarded the Nobel Prize in Physics for his color photography technique. Lippmann died at sea on July 13, 1921, on his return from a trip to North America.

See also: Lumière, Auguste and Louis.

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LITERARY GAZETTE

also *Journal of Belles Lettres, Arts, Sciences*

The *Literary Gazette* was a weekly review of literature, science and the fine arts that began publication on 25 January 1817. As well as being an important journal in its own right, its format provided the model for subsequent periodicals like the *Athenaeum*. The character of the *Literary Gazette* owed much to William Jerdan, who edited the journal from July 1817 to December 1850. Jerdan was a well-known figure on the literary scene and contributors to the *Literary Gazette* included Charles Lamb, Robert Southey, Edward Bulwer-Lytton, and Sir David Brewster. The *Literary Gazette* was at its most influential during the 1820s and 1830s before the commencement of the cheaper *Athenaeum*. In 1832 it was selling 4,000 copies a week, a large circulation for the time. However by 1860 sales had dropped to around 1,000 copies.

As well as its literary merits, the *Literary Gazette* reported on the meetings of the most significant scientific and learned societies. Its Parisian correspondent also provided frequent short accounts of papers read at the *Academie des Sciences*. *Mitchell's Press Directory* (1847) declared that its pages "combine the 'utile et duce' of periodical criticism, and are often the first to promulgate the novelties of science and literature." Jerdan himself was a member of the British Association for the Advancement of Science and claimed to have attended every meeting. His autobiography declared that, with some assistance, he himself "made up the [science] reports which filled hundred of columns of my publication" (*Autobiography*, vol. 4, 292). Although its articles do not carry the same authority or technical detail as the *Athenaeum*, several significant developments in early photography were announced in the *Literary Gazette*.

Henry Fox Talbot, Antoine Claudet, and Francis Bauer were among the notable figures who sent letters to the journal. Soon after Arago had made his announcement of Daguerre's process to the *Academie Des Sciences*, Francise Baur championed the cause of Niépce though a letter to the *Literary Gazette* that was printed on 2 March 1839. Similarly, immediately prior to making a patent for his calotype method, Henry Fox

Talbot published a letter announcing his discoveries on 8 February 1841. Talbot went on to send several letters recording the way that he had discovered his new process. He also used the *Literary Gazette* to communicate new developments to a wider audience. In the edition of 10 July 1841, for example, Talbot sent a letter that he had received from Dr Schafhaeutl, in Munich, detailing advances in photography "which, it is to be regretted, are little known in England."

The important role of the *Literary Gazette* in popularising photography is particularly evident in its export to America. After reading a copy of the periodical that had been transported to New York, Dr John William Draper, a friend of Samuel Morse, constructed one of first American Daguerreotype cameras in September 1839.

During the 1850s, the *Literary Gazette*'s coverage of photography was reduced to only intermittent reviews of the various photographic exhibitions. Its declining commercial fortunes meant that it finally ceased publication on 26 April 1862.

JOHN PLUNKETT

See also: Brewster, Sir David; Talbot, William Henry Fox; Claudet, Antoine-François-Jean; Bauer, Francis; Arago, François Jean Dominique; Daguerre, Louis-Jacques-Mandé; Calotype and Talbotype; Draper, John William; and Morse, Samuel Finley Breese.

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LITHOGRAPHY

Alois Senefelder (1771–1834), an Austrian actor and playwright, announced his planographic printing process of lithography in 1798. Lithography formed a major component of the revolution in print media that took place during the first half of the 19th century. By the 1840s lithography became widespread and in London, lithographic printing houses began to outnumber those of copper- and steel-plate printers.

Lithography had several advantages over relief and intaglio processes since the printmaker no longer needed to carve, scrape or dot a design onto the plate but could draw or paint it in a greasy substance on a porous printing surface, usually stone. It was a highly versatile process since a wide variety of drawing media could be used to produce the image, including chalk, crayon and pen and wash. Another feature of lithography was that it could in some respects mimic intaglio processes.

Lithography was to act as a primary building block to the photographic processes of Niépce, Daguerre, and Talbot and, in the form of a number of 'hybrid' processes, heralded photomechanical reproduction. However, while the inventors of photolithographic processes have received attention from historians, the history of photolithographic printers themselves remains largely unwritten.

A lithographic printing plate could be produced far more quickly than could those of traditional processes. This speed became even more advantageous when coupled with the acceleration in manufacture introduced in the early nineteenth century by the new mechanical printing presses. Furthermore, the lithographic stone could produce a very large number of impressions, which again brought considerable economic benefits as did the fact that, unlike steel and wood engraving, stones could be easily re-used. These were the prerequisites for mass production and for low unit costs, and they were to be central to the ultimate success of photography. As such they help explain why lithography and photography were such suitable and effective partners.

The introduction of photolithographic processes in the 1850s was the result of research initiated by Nicephore Niépce (1765–1833) and advanced by, amongst others, commercial lithographers and printers. Rose-Joseph Lemercier (1803–1887) had already been experimenting with combinations of photography and lithography since at least 1848. Together with Louis-Alphonse Davanne (1824–1912), Noël-Marie Paymal Lerebours (1807–1873), and Charles-Louis-Arthur Barreswil (1817–1870) Lemercier developed a planographic photolithographic process (*lithophotographie*) which was deposited with the Académie des sciences on 28 June 1852. In this photolithographic process a grained lithographic stone was coated with a solution of bitumen of Judea and ether, contact-printed with the original and then developed with ether. In 1854 six photographic views of French medieval churches by Henri Le Secq were published by this photolithographic process. However, in 1857 Lemercier abandoned this process, which could pull only a limited number of proofs, and purchased and comparatively successfully used the process invented by one of the most significant figures in the history of photomechanical reproduction, the French chemical engineer Alphonse Poitevin (1819–1882) whose process could provide up to 700 impressions from one stone. In 1855 had

Poitevin patented his photolithographic process in both France and England. He went on to win both prizes awarded through the competition to find a permanent photographic print process sponsored by Albert, duc de Luynes (1802–1867). Poitevin's process was improved by F. Joubert in London in 1860.

In 1857, John Pouncy's *Dorsetshire photographically illustrated* was published. Pouncy referred to the process used as photolithography but the images are heavily retouched and Pouncy may have meant that the original photography was manually copied by lithography that was in turn photolithographed. In the same year, in the Netherlands, Eduard Isaac Asser (1809–1894) invented a photolithographic process.

Around 1860 there were a number of significant advances in photolithography—largely as a result of state funding. Photozincography—invented by Colonel Henry James of Ordnance Survey Office in Southampton in the late 1850s—was based on a zinc plate rather than stone support. The process was extensively used in the reproduction of maps, though James also reproduced a series of historical and illuminated national manuscripts including the medieval Domesday Book. The reproduction of line illustrations and map printings was first made workable in commercially viable quantities in the late 1850s by John Walter Osborne (1828–1902) while working in the Department of Lands and Survey in Melbourne.

The facsimile reproduction of important historical manuscripts was another area in which photolithography was to have a significant impact. In 1866 the London publisher Day & Son exploited photolithography to publish an "exact facsimile" of William Shakespeare's famous First Folio of plays published in1623. From 1868 William Griggs (1832–1911) of Peckham in South London, used photolithography to reproduce manuscripts, drawings and plans for a number of publications on Indian art and architecture, several of which were reports connected with the Archæological Survey of India.

Photolithography became increasingly exploited during the 1860s and this encompassed variants on the printing support and the integration of photography, lithography and other reprographic processes in 'hybrid' forms. Jules Labarte's *Histoire des Arts Industriels au Moyen Age et à l'époque de la Renaissance*, published in Paris between 1864 and 1866, is a particularly pertinent example in which photographic, photolithographic and chromolithographic processes were combined. The apogee of such a complex combination appeared in 1890 when the Art Institute Orell Fussli of Zurich invented the Photochrom—based on photolithography and used between four and fourteen asphalt coated lithographic stones to produce a "full colour" image from a black and white negative.

In Germany in the 1860s, photolithography was used to reproduce topographical views such as those printed by the firm of von Frey of Frankfurt-am-Rhein. However, it was the reproduction of architectural line drawing that saw the process's most influential role. J. Akerman of London was particularly prominent in this field. From the 1870s many of his photolithographs appeared in professional journals such as *Building News.*

Offset lithography, the commonly used photomechanical process to reproduce photographs, was introduced in England in the mid to late 1870s though the first application to print onto paper rather than metal took place in 1903 in America through the process developed by Ira Washington Rubel (died 1908)

Photolithography continues to play a prominent role in 21st century industries through its application to integrated circuits semi-conductor device fabrication.

ANTHONY J. HAMBER

See also: Niépce de Saint-Victor, Claude Félix Abel; Daguerre, Louis-Jacques-Mandé; Talbot, William Henry Fox; Lemercier, Lerebours and Bareswill; Davanne, Louis-Alphonse; Le Secq, Henri; Poitevin, Alphonse Louis; and James, Henry.

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LIVERNOIS, JULES-ISAÏE (1830–1865) AND JULES-ERNEST (1851–1933)

Canadian photographers

Jules-Isaïe Benoit *dit* Livernois was born on October 22, 1830, in Longueuil, near Montreal, Quebec. He

established his daguerreotype studio in conjunction with a sewing machine business in Quebec City in December 1854. At the height of his brief photographic career, he operated up to three studios. Married in 1849 to Elise L'Heureux (L'Hérault), she, like other husband and wife photography teams such as Darius Reynold Kinsey and his wife Tabitha, participated fully and sometimes independently in the photography business. Between 1857–1858, Elise worked under the name Madame Livernois and took daguerreotype portraits of children. After her husband died on October 11, 1865, of tuberculosis, she assumed management of his studio and established a partnership in May 1866 with her son-in-law, the photographer Louis Bienvenu; the Livernois & Bienvenu partnership dissolved in April 1873. By December 1873, her son Jules-Ernest Livernois, born on August 19, 1851, in Saint-Zéphirin-de-Courval, Quebec, assumed ownership of the Livernois studio. J.E. Livernois perpetuated his parents' vision by traveling throughout Quebec for landscape views and exterior group portraits, much as his competitor William Notman and his sons did throughout Quebec and other parts of Canada. Unlike Notman and Alexander Henderson, however, the Livernois family spent little time photographing outside Quebec. After J.E. Livernois' death on June 8, 1933 in Quebec City, the portrait studio continued to operate until 1974, first by J.E. Livernois' son Jules Livernois (1877–1952), then by an owner-operator, who left in 1969; J.E. Livernois Limitée went into bankruptcy in 1979. The largest collections of the Livernois photographs, a remarkable, detailed record of many aspects of life in Quebec, are preserved by the Library and Archives Canada and the Archives nationales du Québec. J.E. Livernois was one of four 19th-century photographers commemorated with a Canadian postage stamp in 1989. The Livernois family is also memorialized in Quebec place names.

DAVID MATTISON

LLEWELYN, JOHN DILLWYN (1810–1882)

Welsh photographer, polymath, and landowner

John Dillwyn Llewelyn was born John Dillwyn 12 January 1810 at The Willows, Swansea, the second child and eldest son of Lewis Weston Dillwyn, Fellow of the Royal Society and the Linnean Society, and Mary, *nee* Llewelyn. Upon coming of age, he assumed additionally his maternal grandfather's surname Llewelyn inheriting his estates. He usually signed himself J.D. Llewelyn.

Grandfather Llewelyn died in 1817 and the family moved to Penllergare, his former estate. In 1833 Llewelyn married Emma Thomasina Talbot, youngest daughter of Lady Mary Lucy and Thomas Mansel Talbot of Penrice and Margam, and youngest cousin of Henry Fox Talbot of Lacock Abbey. Children included the eldest, Thereza who married Nevil Story Maskelyne. At Penllergare, Llewelyn designed a supreme example of Victorian landscaping, creating two artificial lakes, a man made waterfall and growing many exotic trees and plants, some from Henry Talbot, and Sir Joseph Hooker of Kew. In his walled garden he grew tea, coffee, pineapples, and created a heated glasshouse for the propagation of orchids with a waterfall and pond.

Educated by private tutors, Llewelyn matriculated at Oriel College, Oxford in 1827. He met many of the leading scientists of the period including Sir Charles Wheatstone, Faraday, John Wheeley Gough Gutch, another early photographer, and the Groves. In 1844 he assisted Wheatstone with the first ever experiments in sub-marine telegraphy off the Mumbles, south Wales. The same year he welcomed Isambard Kingdom Brunel to Swansea for the south Wales extension of the Great Western Railway.

Llewelyn was elected a Fellow of the Royal Society, 1836, and the Linnean Society, 1837. Henry Talbot considered Llewelyn to be the first botanical photographer. In 1842 Llewleyn used the daguerreotype process to send images of rare orchids to Kew for identification. In 1848 Llewelyn demonstrated the propulsion of a small boat by an electric motor, the first time this was done in Britain, to the British Association for the Advancement of Science meeting in Swansea.

Llewelyn's public duties included being a magistrate and a member of, many local committees. He endowed schools, churches, and a large park for the people of Swansea.

News of Talbot's photographic discovery reached Penllergare in February 1839, from Talbot. Llewelyn immediately began experimenting with the new process and also the daguerreotype process. Early photogenic drawings have disappeared but the earliest daguerreotype is dated 1840. His friend, and distant relative, Calvert Richard Jones, also joined in the local excitement. Later photographic friends included Antoine Claudet, with whom Llewelyn carried out experiments on the daguerreotype process, and Philip Delamotte. Llewelyn tried all the early processes but mainly used the calotype and collodion. When Talbot challenged Laroche in 1854 for an infringement of his calotype patent, Llewelyn wrote to Peter Fry:

> I heartily grieve to hear of all his present litigation, his first step to secure himself an exclusive monopoly was a most inadvised one. It has put him in a false position and must terminate in an abundant harvest of vexation, trouble and loss. It seems however to be with him a kind of monomania—he must be a little insane on that point.

Llewleyn also tried the photoglyphic drawing process and was invited by Talbot to visit Lacock to discuss it.

Llewelyn, John Dillwyn. Thereza, From an Album of Photographs. *The Metropolitan Museum of Art, Gilman Collection, Gift of The Howard Gilman Foundation, 2005 [2005.100.382 (1-85)] Image © The Metropolitan Museum of Art.*

Llewelyn was a founder Council member of the Photographic Society of London in 1853, and was later nominated first Country Vice-President in December 1854. He exhibited at their first exhibition in 1854 and continued until 1858. At one exhibition Queen Victoria took away a print of the November Fifth Guy Fawkes bonfire and another had to be sent from Swansea. There are a number of Llewelyn's photographs in her albums. He also exhibited at Dundee in 1854 and the Manchester Art Treasures exhibition in 1857. In 1855 Llewelyn was one of the British photographers at the Exposition Universelle in Paris, exhibiting four images under the title of *Motion* including probably the first ever photograph, by the collodion process, *Clouds over St Catherines, Tenby* taken in 1854, where the clouds are on the same negative as the main scene. Llewelyn was awarded a silver medal of honour. His first instantaneous image was taken in 1853 of *Waves Breaking in Caswell Bay*, an exposure estimated at one twenty-fifth of a second, and probably using a falling shutter of his invention. In 1859 he contributed two images to"*The Sunbeam* a book of photographic images produced by Delamotte. Announced, by Joseph Cundall in 1854, but never published, was *Pictures of Welsh Scenery*.

The major problem with the collodion process was sensitizing, exposing, and developing in a comparatively short time. In 1856 Llewelyn announced his oxymel process, peserving the collodion in a moist state for many days or weeks. *The Illustrated London News* hailed this as one of the greatest boons for photographers. He also experimented with glycerine and dry collodion plates but was not satisfied with the results.

In 1859 Llewelyn, Maskelyne, Hadow, and Hardwich, wrote a paper on *The Present State of our Knowledge regarding the Photographic Image* for the British Association for the Advancement of Science.

Photography was a family commitment and Llewelyn taught his brother Lewis Llewelyn Dillwyn, sister Mary and daughter Thereza. In 1856 he bought Thereza a single lens Murray & Heath stereo camera for her birthday. They both used it and Thereza often made a stereo image whilst her father made a mono one. Emma

appears never to have made a camera image, but did much of his printing, to an extent that Henry Talbot asked if she needed help from Nicholas Henneman.

In the 1860s, Llewelyn joined the Amateur Photographic Association, contributing to their exchange albums and becoming a member of council. He abandoned making images around the end of the 1850s possibly due to life-long asthma. In January 1854 he had been very ill, most likely due, so his mother-in-law Lady Mary wrote to Henry Talbot, to inhaling poisonous photographic chemicals.

In 1859 local militia were organised to repel a possible French invasion. Llewelyn captained the Penllergare 5th Corps. The same year he appears in a photograph, including Roger Fenton, titled *Volunteers at Hythe*.

In the late 1870s the Llewelyns moved to London and he died at Atherton Grange, Wimbledon, on 24 August 1882. He is buried next to Emma in the churchyard of his church at Penllergaer.

RICHARD MORRIS

See also: Wheatstone, Charles; Faraday, Michael; Gutch, John Wheeley Gough; Talbot, William Henry Fox; Jones, Calvert Richard; Claudet, Antoine-François-Jean; Delamotte, Philip Henry; Collodion; Calotype and Talbotype; Laroche, Martin; and Victoria, Queen and Albert, Prince Consort.

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LOCKEY, FRANCIS (1796–1869)
English

Francis Lockey was born at Reading, Berkshire England, in 1796 studied at Cambridge and became a priest in 1823. He became vicar of Swainswick, a small village outside Bath in 1836, where he lived with his wife Susanna and daughter Emma.

Lockey used the daguerreotype process but is chiefly known for using calotype and waxed paper negatives well into the late 1850's. Lockey documented the Medieval, Georgian and early Victorian buildings of Bath and surrounding towns and villages. His pictures show largely deserted locations, never, or only accidentally, having figures in the composition. This was partly caused by the long exposures required with his large-format paper negatives, his negative list (private collection, UK) gives exposure times between three and fifteen minutes. Lockey also produced many large-format stereo views (most negatives were 11 × 9 inches) for use in a Wheatstone viewer.

Many of his studies were made with the help of his coachman Henry Burrough, often using the roof of his carriage as a platform to record churches and other historic buildings. Lockey was very dedicated to his craft, being well into his late fifties when making his architectural views. As well as photographing in the Bath area Lockey travelled to south and west Wales and made many studies of ruined castles, abbeys and priories in and around Swansea.

Later Lockey used the wet-collodion process to make portrait studies but unfortunately these glass negatives were destroyed. Many of his paper negatives, however, survive in museums in Bristol, Bath, and Wales.

IAN SUMNER

LOECHERER, ALOIS (1815–1862)
German photographer and studio owner

To his contemporaries, Alois Loecherer was the most well known as a distinctive portraitist of the better half of Munich's society in the 1850s. From 1845 he used Talbot's process and opened his first studio in 1848 in

the house of Franz Hanfstaengl. In 1849, he was the first to announce "photography on paper" in Munich and offered lessons in this method. In 1850, he opened the first exhibition of his genre photographs at the Munich Kunstverein. He produced large numbers of view of Munich's streets, places, backroads, and old houses. Alois Loecherer was best known for his series on the construction and erection of Ludwig Schwanthaler's statue of the Bavaria which formed one of the first series in photographic journalism.

Loecherer was the pioneer of salt printing and photography on paper in the German speaking countries. His print had comparatively large formats were overtly intended to be exhibited. Due to his early death Alois Loecherer was not able to nuture the needed impact on the development of German photography as a form of art.

Alois Loecherer was born on August 14, 1815, in Munich. From 1837 to 1839, he studied chemistry and pharmacy at Munich University under Franz von Kobell. From 1840 to 1848, he worked as a pharmacist in Munich. Married in 1849, had two daughters born in 1851 and 1852. In 1853 he settled in as a portraitist in his own house in Munich. Died on Aug. 15, 1862, of a brain attack. His studio was taken over by the photographers Albert Kristfeld and Bernhard Froehlich.

ROLF SACHSSE

LONDE, ALBERT (1858–1917)

French medical researcher, chronophotographer

Londe was born in 1858, the date and place of his birth remain unknown however. Londe was one of the pioneers of medical photography and more particularly of photography with x-rays. He was also the inventor of a form of instantaneous photography: Chronophotography, which is a Victorian application of science (the study of movement), and art (photography). The word is from the Greek chronos and photography, "pictures of time." Notable chronophotographers include Eadweard Muybridge, Etienne-Jules Marey and Ottomar Anschütz. Chronophotography and Londe are both affiliated with professor Charcot's photography which marked the beginning of medical photography's history. However, Londe's photography was characterized by chronophotography's instantaneous and motion-analyses. In 1879 Londe became a member of the Société française de photographie (S.F.P.) in Paris.

In 1878 a laboratory for medical photography had been set up at La Saltpêtrière hospital in Paris. In 1882 Londe began working there as the director of photographic service in the laboratory of the Hospice of the Salpétrière, which had a partnership with the Clinic for diseases of the nervous system run by professor Charcot. Londe broached most issues of concern regarding photography. He ordered the construction of a variable-speed, circular shutter, which was destined to replace the existing guillotine and wing shutters that proved inadequate for animated subjects or swiftly moving objects. Research conducted by Muybridge and Anschütz gave him the idea, that where speed is concerned, camera should use several lenses. Londe constructed a camera fitted with nine lenses arranged in a circle. A series of electronic magnets energized a sequence regimented by a metronome device released nine shutters in quick succession, taking nine pictures on a glass plate. He used the camera to study the movements of patients during epileptic fits. Londe's improved camera of 1891 used twelve lenses (in three rows of four) and was used for medical studies of muscle movement in subjects performing a variety of actions as diverse as those of a tightrope walker and a blacksmith. The sequence of twelve pictures could be made in anything from 1/10th of a second to several seconds. The design of Londe's laboratory at La Saltpêtrière was in many ways similar to Marey's Station Physiologique, and was similarly subsidized by the Parisian authorities. Although the apparatus was used primarily for medical research, Londe noted that it was portable, and he used it for other subjects—horses and other animals, and waves, for example. General Sobert developed, in conjunction with Londe, a chronophotographic device to help in the study of ballistics. Londe's pictures were used as illustrations in several books, notably by Paul Richer, widely read in medical and artistic circles.

During 1884, Londe lectured on photography and its scientific applications.

In 1887, he worked with Tissandier, and the Société d'Excursions des Amateurs Photographes. He was the vice-president from 1887 to 1895, president from 1895 to 1900, and president for life from 1900 on. Consequently, Londe had many photographic adventures starting with the circus, bullfights and with the theatres of the streets. The excruciating exercises of collecting images of new subjects preceded the photo-journalistic iconography. Furthermore, these subjects belonged to a universe located between reality and imaginary, and because of this limbo were curiously connected to the patients that Londe photographed in Salpetrière. These portraits reveal an attraction for the marginal beings of the industrial time.

In 1888 Londe did experiments with shots of a clown doing a perilous jump at the Hippodrome and are likely considered a study of instantaneous photography.

In 1890 he was elected a board member of the Société française de photographie, and by 1892, had been elected to the position of assistant general-secretary. During that period he compiled numerous reports on prices, inventions, and cameras.

In 1893 he constructed a camera for pictures 7 × 7 cm on plates 24 × 30 and he lectured on photography at the Arts et Métiers in Paris. In 1895 with the advent of Röntgen's X, he began creating the first radiography and radioscopy laboratory for Parisian hospitals.

The beginning of 1900 he began experimenting with several ways to photograph using artificial lighting. He experimented with neon, but the results were not successful. He showed them, however to the Club Nautique in Nice. In 1904 he resigned as active member from the Société française de photographie in Paris. Londe continued experimenting with artificial light and used magnesium, which caused a short explosion, giving off a burst of light.

Around 1908 he made a chamber based on his experiments and plan of his chrono-photographic machine, which used artificial light. He discovered also the possibilities of creating duplicate images. Because of these two contributions to photography he was made an honorary member.

Londe's interest in the Autochrome process grew in the last years of his life. The autochrome was a positive colour transparency process, patented in June 1906 by Auguste and Louis Lumiére in Lyon, France. Like other techniques at the time, it employed the additive method, recording a scene as separate black and white images representing red, green and blue, and then reconstituting color with the help of filters. To do this on a single plate, the Lumiéres dusted it with millions of microscopic (avg. size 10 to 15 microns) transparent grains of potato starch that they had dyed red (orange), green and blue (violet). This screen of grains worked as a light filter to interpret the scene when the light passed through them exposing a panchromatic black & white emulsion. The exposed plate was then reverse processed which resulted in a transparency. The first time he lectured at l'Academie des sciences his presentation was on this first industrial color method. In front of many specialists and professionals, he successfully tested with the plates, which later came onto the commercial market in 1907. He published in two years 12 texts concerning this topic. However none of its experiments was publicly shown. In 1908, his experimentation abruptly ended when his wife died, but he started again with his experiments in 1909. Finally in 1914, he showed his photographs to the Photo-Club of Nice.

He left his collection of works, equipment and documents to the Société française de photographie (S.F.P.) in Paris.

He died September 11, 1917, at the Château de Bréau at Rueil, near La Ferté-sous-Jouarre in France.

JOHAN SWINNEN

See also: France, Chronophotography, Medical Photography; X-ray Photography; Instantaneous Photography; Société Française de Photographie; and Lumière, August, and Louis.

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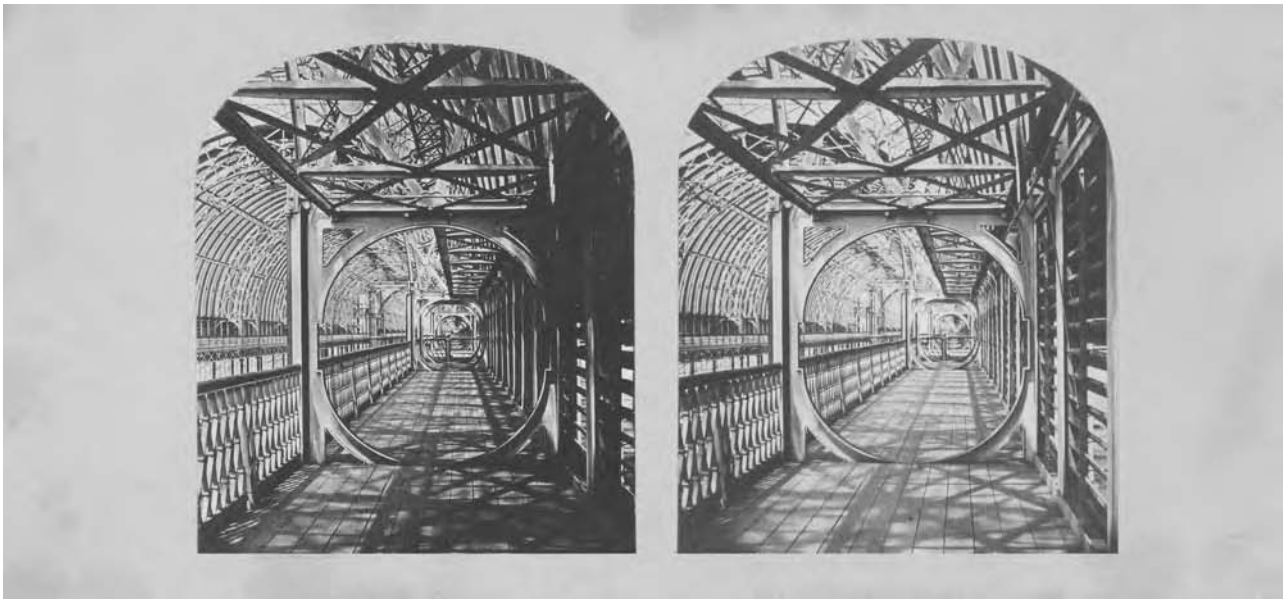
LONDON STEREOSCOPIC COMPANY (c. 1854–1922)

When stereographs were demonstrated to the public at the Great Exhibition of 1851 they started a collecting craze that was to last for the next twenty years. The principle of using binocular vision to create the illusion of space had been known for some time but the introduction of photography meant its potential could finally be realised and the stereoscope, developed by Charles Wheatstone and Sir David Brewster, allowed photographs to be viewed in "solid" three dimensions. The London Stereoscopic and Photographic Company, as its name suggests, furnished the Victorian mania for stereographs and by 1854 the company had sold over half a million viewers, proclaiming in their advertising that "no home is complete without a stereoscope."

Shopkeeper George Swan Nottage (1823–1885) founded the company with his associate Howard Kennard in the early 1850s. Nottage went on to make his fortune, and was later elected Alderman and then Lord Mayor of London (1884–1885.) London Stereoscopic was soon the largest photographer and manufacturer of



London Stereoscopic Company. The Telescopic Gallery.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

stereographs in the Victorian era. By 1858 they were advertising 100,000 views of famous buildings and places of interest in England and abroad (although the actual figure is more likely to have been a tenth of that) and manufacturing stereoscopic cameras as well as viewers for the consumer market. Their photographers travelled as far afield as the Middle East and America. William England, who was with the firm from its inception travelled in America in 1858 and 59, documenting New York, the Hudson River, and Niagara Falls, and the new railways and bridges along the route. The important "North America Series" was immensely popular, being amongst the first photographic views of the US to arrive in Britain. England was instrumental in building the firm's reputation with travels in Ireland in 1857 and Paris in 1860 and technical advances in equipment including the invention of the focal plane shutter. He also produced the popular Comic series, which though derided at the time by intellectuals as "low art" is now an important record of Victorian domesticity and street life. His last major venture for the company was as sole photographer of the 1862 International Exhibition, for which London Stereoscopic paid the enormous sum of £1,500 for exclusive photographic rights.

London Stereoscopic also bought, distributed and published material by non-commissioned photographers, including the work of William Grundy of Sutton Coldfield (1806–1859) whose collection of 200 negatives was acquired after his death. Grundy had published a series of half stereos to illustrate *Sunshine in the Country, A Book of Rural Poetry,* (Richard Griffin & Co, 1860) comprising of idyllic rustic scenes, country folk and rural occupations. London Stereoscopic's 1860 catalogue also advertised a series of views of Switzerland by Adolphe Braun and though William England left to pursue his own career in 1863 he continued to publish views through the company's catalogues under his own name. Renowned sports and war photographer Rheinhold Theile worked as a watercolourist and photographer for the company between 1880– 894. These references to individuals are unusual, however, as London Stereoscopic rarely divulged the names of their operators.

In 1862 alone the company sold one million stereoscopic views and had offices and agents as far afield as New York. During the 1860s and 1870s, however, stereoscopy began to decline in popularity. London Stereoscopic diversified their interests adding large format travel views and portraiture to their catalogues. By 1889 they advertised a comprehensive range of cameras, lenses and general photographic goods and also offered a wide range of photomechanical printing services, including Woodburytpe, collotype, photomezzotype, photolithography, and platinogravure. Their Woodburytypes were widely used in book publication and periodicals, and next to the Woodbury Company itself London Stereoscopic were the largest manufacturers of Woodburytypes in England, often donating albums of Woodburytypes to hospitals and charities. In 1896 the commercial department of the firm at 54 Cheapside, London offered letterpress printing to the trade, as well as commercial printing of photographs in silver, bromide, carbon and platinum. They had also begun to expand into newly opened area of photoengraving and made half-tone blocks for the printing trade.

An important spin-off for the company was the

carte de visite market. Originally introduced as a novel and inexpensive idea for personalising visiting cards, Disdéri's method of taking multiple images on a single plate was the perfect medium for mass producing images of the rich and famous. The Victorians wild thirst for collecting, building up albums of politicians, clerics, actresses, and sporting heroes, was termed "cartomania" and sparked an unquenchable fascination with celebrity images that persists today. In 1861 and 1864 London Stereoscopic opened portrait studios at 110 and 108 Regent Street respectively (106 was added in 1875 while 110 closed in 1888.) They were amongst the most fashionable and chic in Europe and their catalogue of clients reads as a Who's Who of the Victorian age. Names such as Charles Dickens (including a rare portrait without beard), Sarah Bernhardt, William Booth, John Everett Millais, and William Gladstone filled the catalogues. Lord Palmerston sat for four dozen portraits in one sitting alone. They also published the famous image of the *Leviathan* engineer Isambard Kingdom Brunel by Robert Howlett in various formats and became *Photographers to Her Majesty* after obtaining the Royal Warrant in 1895. In addition to their brisk trade for the private carte-de-visite collector the London Stereoscopic commercially licensed their photographs and celebrity images for use in the press and periodicals of the day such as *The London Illustrated News* and *The Graphic,* and in theatre programs and music sheets. Their photographers covered newsworthy events such as the re-opening of Crystal Palace by Queen Victoria in 1854. In 1871, during the Franco-Prussian War London Stereoscopic Company produced micro-photographic prints, each barely larger than a postage stamp, of special pages of *The Times* devoted to messages to the inhabitants of Paris, which arrived in the besieged French capital by pigeon post.

A great deal of London Stereoscopic's success can be attributed to their versatility, keeping pace with new trends and innovations in photography. Their interests were incredibly diverse and forward-looking. The company held the patent for and manufactured a popular model of the zoetrope, having earlier revived interest in persistence of vision by demonstrating the illusion of a vase by rotating a bent piece of wire and, for a time, was the sole licensee of the phonograph. Their Regent Street offices finally closed in 1922 but they should be remembered as one of the world's first and largest producers of licensed imagery on a global basis. Their catalogue is a lasting record of and tribute to the Victorian era, documenting new worlds and great engineering projects alongside the growing obsession with celebrity and home entertainment.

SARAH MCDONALD

See also: Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); Brewster, Sir David; Wheatstone, Charles; England, William; Braun, Adolphe; War Photography; Woodburytype, Woodburygravure; Collotype; Cartes-de-Visite; and Victoria, Queen and Albert, Prince Consort.

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LOPPÉ, GABRIEL (1825–1913)
French photorapher

Born in 1825, in Montpellier, South of France, Gabriel Loppé studied in Paris and learned painting from François Diday (1820–1877), a landscape artist located in Geneva, Switzerland. A few years later, in 1848, he realized his first landscape paintings, in huge formats and panoramas appreciated by English gentlemen. Most of these patrons were members of the Alpine Club of London, as Loppé had been since 1864 who was also fascinated by exploration hikes and mountains.

Loppé's interests in photography was likely inspired by the Bisson brothers during their trip to Mont Blanc, on which he accompanied them in 1861. He never practiced as a professional photographer, and remained an amateur. As a matter of fact, he showed little interest in technique or composition, and used photography simply to create visual mementos.

Settled his studio in Geneva in 1862, Loppé opened an exhibition gallery in Chamonix in 1870. After the death of his first wife in 1874, he married Elizabeth Eccles in 1879, in London and moved to Paris in 1880, where he photographied his every day life, and of his family near the site of the Eiffel tower. Towards the end of the ninteenth century, Loppé developped a pictorialist aesthetic, particularly backlighting and smog effects under the electric light during the night.

He died in Paris in 1913.

MARION PERCEVAL

LORENT, JAKOB AUGUST (1813–1884)
Scientist and inventor

Jakob August Lorent was born on December 12, 1813, in Charleston, South Carolina. After his father died and

his mother remarried, his mother moved the family to Mannheim in 1818. In 1829, Lorent graduated from the secondary school in Mannheim and began attending the University of Heidelberg. In 1837, Lorent completed his scientific doctoral thesis, and thus graduated. Due to his family's affluence, Lorent, a private and introverted young man, was able to follow in the foot steps of his role model, Alexander von Humboldts and travelled to Egypt and Asia Minor, where he studied the natural landscape. After the death of his stepfather, Lorent received his estate which allowed him an absolute financial freedom.

During his travels to London in 1850, Lorent met W. H. Fox Talbot who introduced Lorent to photography and Talbot's own calotype process. Due to Lorent's education in science, he was able to modify Talbot's process, enabling him to become one of the most prominent photographers of his time. He understood very quickly that photographs are very easy to copy and therefore he'd only take a few photographs and focus on their quality.

His original Venice photographs measured 38 × 47 cm, but by 1856 he was using the much larger 45 × 55 cm format. These Venetian photographs increased Lorent's reputation in the European photographic community. In 1856, he exhibited these large-sized albumen prints in Brussels during a critical time of photography. Nevertheless, the editor of the photographic journal *La Lumière* based in Paris, Ernest Lacan, was absolutely enthusiastic about Lorent's work. He named Lorent the "Venetian Baldus," because Lorent's works echoed the close-up photography of Le Louvre by Edouard Denis Baldus.

Jakob August Lorent donated some of his large-format architectural photographs of Venice—worth about fourteen guilder ($160)—to help in the restoration of a church in Weimar. In the making of these large format photographs, Lorent chose to use le Gray's waxed paper process, rather than the widely popular wet collodion process on glass, greatly reducing the weight of materials he had to carry. Although the wax-paper process was favoured because it supplied sharps results, it was particularly favoured by touring photographers because of an incident that happened to Louis Auguste Bisson on his great photographic tour in 1858 through south of France when all of his glass negatives broke during a coach accident near Toulouse.

Lorent also developed the paper negative through the use of beeswax in such a way that he achieved a consistent transparency so that structure of the paper fibres, under the diffuseness of the beeswax, disappeared nearly 100 per cent. This approach influenced William Henry Fox Talbots photographs and led the French photographer Gustave Le Gray to develop a special paper negative process, which he patented 1851.

During the revolution of 1848 Lorent left Mannheim for London and married there in 1850. Lorent returned to Mannheim in 1858, from where he travelled to Granada and then to Algeria, to document old Islamic art. In 1859, Lorent took a second journey to Egypt, up the Nile, and to Nubian in pursuit of old Egyptian art that he intended to document. As was the case with his Venetian photographs, Lorent's work was also grand, the negative format being 45 × 55 cm.

Lorent reproduced the photographs of the voyages that he took between the years 1858 and 1860 in an album, that he then dedicate and personally gave to the duke of Baden, Friedrich II, entitling it, "Egypten, Alhambra, Tlemsen, Algerien" (Mannheim, 1861). Lorent noted, "As far as I know, there is no photographic work in Europe, that apprehends so completely the old manner of Egyptian art and Eastern architecture."

Lorent left for the country in November of 1860 due to political instability caused by the Bavarian King Otto I, whose reign was similar to the Osmanic Domination in Greece. Initially, he travelled to Italy and then to Corfu and Athens and in the summer 1862 he took a second trip to Greece. That same year he produced an album with "Pictures from Athens" in Mannheim.

These six years of tireless activity, both physical and artistic, are accurately represented as the apogees of his photographic career, which is evident as Lorent's large-sized photographs have no equal from 1850 to 1860. His wax paper negatives possess the outlet an hot components, that could be found, rarely through the use of wet collodium process, and mostly only through posterior tint by printing. The awards of the World Exposition in London and the Exhibition in Amsterdam in 1862 confirmed his prominent position and unrivalled talent.

In 1863 Lorent travelled to Turkey, Syria, and Egypt, then some months later in April of 1864, he went to Palestine and Egypt again. One final journey in 1865 led Lorent to Sicily. From this point on, he took photographs mainly on his "choice land," the Grand Duche of Bade, and mostly of the memorials of the Middle Ages, which he collected into three large-sized albums and produced for the Court.

Lorent donated his books and photographs to the Public Library in Mannheim. In June of 1873, Lorent moved from Mannheim to Meran, Switzerland because of health problems. Although ill, he participated in numerous international exhibitions, and occupied himself with research on platinum prints and took numerous photographs of Meran and its surroundings areas. During this time he wrote descriptive texts that accompanied his albums, giving evidence of his great intelligence and his distinct aesthetic sense. There are few documents, personal notices, and a relatively small number of photographs of this private scholar, most of

which were presumably destroyed during the shellfire of Mannheim in World War II.

On July 9, 1884, August Jakob Lorent died because of lung failure.

MILAN CHLUMSKY

Biography

In 1813, Jakob August Lorent was born in Charleston, South Carolina. He moved to Mannheim in 1818. From 1833 to 1836, he conducted his scientific studies at the University of Heidelberg. The years of 1842 and 1843 consisted of Lorent's voyages through Egypt and Asia Minor and in the autumn of 1845, Lorent revisited Egypt. During 1850 he travelled to London, and in 1851 he moved to Venice. Between 1859 and 1865, he took numerous voyages to Spain, Algiers, Egypt, Greece, Syria, Turkey, and Sicily. From 1865 to 1872 he photographed antique memorials near the Grand Duche of Baden in southern Germany. Finally, in 1873 he moved to Meran and photographed the surrounding area for the rest of his life. Jacob August Lorent died on July 9, 1884, in Meran.

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1845 *Voyages in the Orient during the years 1842–1843*, Mannheim.

1845 *Wanderungen im Morgenlande während der Jahren 1842–1843,* Mannheim.

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1862 *Images from Athens*, Mannheim; *Bilder aus Athen*, Mannheim.

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See also: Baldus, Édouard; Talbot, William Henry Fox; Collodium; Louis Auguste Bisson, Louis-Auguste and Auguste-Rosalie; and Le Gray, Gustave.

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LOTZE, EDUARD MORITZ (1809–1890)

German painter, artist, photographer, and studio owner

Eduard Moritz Lotze was born in 1809 in Freibergsdorf (Germany) to a family of farmers. He studied painting, drawing and lithography in Meissen and later at the Academy of Fine Arts in Dresden. In Munich began his professional career as painter and lithographer and there he learned the rudiments of photography. In 1852, he opened a photographic studio with his brother in law Hanfstaengl. Lotze moved to Verone (Italy) in 1854 where he opened a new photographic studio, which he left to his son Richard after his definitive return to Munich in 1868. He died in Munich in 1890.

While in Verone, he experienced a great professional success as a portrait photographer and photographed the Austrian military forts surrounding the city. He actively participated in the cultural life of Verone and exhibited his photographs at important expositions in the city. He was also well known in scientific circles for his *Saggio fotografico di alcuni animali e piante fossili dell'Agro Veronese* (Photographic Essay of a Few Animals and Fossils Plants of the Countryside of Verone) published together with Massalongo in 1859 and for *Monumenta graphica* as well as it is illustrated with photographic reproductions of pages from ancient codex, which was from Verone's and Padua's historical libraries.

CARLO BENINI

LUCKHARDT, FRITZ (1843–1894)

Austrian photographer, technical writer

Fritz Luckhardt was born on 17 March 1843 in Kassel (Germany, at that time seat of the government of the Kurfürstentums Hessen), the son of a soap manufacturing family. He received training as a chemist at the polytechnic institute in Kassel. During a stay in Paris he decided to become a photographer and joined the service with René Prudent Partrice Dagron. He spent a short time in England, and then in 1865 went to the establishment in Vienna where he worked first as a foreign language correspondent of the photo dealer and publisher Oskar Kramer. With the opening of his own studio in Vienna in 1867, Luckhardt's rapid ascent made him one of the most sought photographers in Viennese society at that time. In 1900 Félix Nadar called him "Le maître of the maîtres" in *Quand j'étais photographe* (Les primitifs de la photographie). For Henry Baden Pritchard in *The Photographic Studios in Europe*, 1882, Luckhardt was the epitome of a success-conscious and nonchalant gentleman. In the poses and gestures produced, in the purposeful light arrangement, Luckhardt's always more-or-less over-pointed portrait style nevertheless speaks volumes for the requirement for exclusivity of his customers and his own visual culture. In addition he also belonged to the continuous technical perfection and active lobbyism, which Luckhardt followed with the modern equipment of his studios, by various club memberships as well as by book publications and regular contributions in German-language technical periodicals.

Maren Groening

Biography

Fritz Luckhardt was born on 17 March 1843 in Kassel. As son of a family of soap-makers, he was to take over the enterprise of his grandfather and study chemistry at the Kasseler polytechnic institute, then go on to training at Hanover, and finally to work in a Paris perfumery. Instead he turned to photography. After a time with René Prudent Patrice Dragon in Paris and a stay in England, he settled in Vienna in 1865 and opened his own studio there in 1867 as an elegant society photographer. His business success stemmed from portraits of beautiful women (mostly actresses), which he exported in Stereoformat to the United States. He received the title of a K.K. photographer in 1870, and in 1883 was an honorary professor of the duke from Saxonia Meiningen. From 1871 to 1887 he was a secretary of the photographic society in Vienna. In addition he maintained memberships in the photographic Societies of Berlin and Frankfurt/Main as well as in Viennese agencies: Club of the amateur photographers (from 1888, 1893 renamed in Viennese Camera club), Association of Photographic Coworkers (from 1891), scientific association "Skioptikon" (from 1891). After Luckhardt's death in Vienna on 29 November 1894, his widow Franziska took over the studio. The best overview of the former private collection is probably given by Gerd Rosenberg in Vienna. In 1908 the Viennese city and federal state library bought 15 letters addressed to Luckhardt.

LUMIÈRE, AUGUSTE (1862–1954) AND LOUIS (1864–1948)

In French, *lumière* translates as "light." Auguste Lumière and Louis Lumière were born into a name that fittingly predicted their future as technological innovators in photography, cinema and, for Auguste, "medical biology, pharmodynamics, and experimental physiology" (Cartwright, 1992, 129). Auguste and Louis Lumière, two of the most famous brothers in the world, were born in Besançon, France. Their father Antoine Lumière (1840–1911) was a painter and a photographer. But their father was more than artistic; Antoine was a born businessman who was greatly motivated by the new inventions during the advent of France's *Belle Époque* (Beautiful Era). The spirit of their father and the spirit of their paternal name set the *mise en scène* for their invention of cinema. By the end of the nineteenth-century, there were many visionaries who were trying to animate the still photograph, including, most famously, Thomas Edison (1847–1931), Eadweard Muybridge (1830–1904) Charles-Èmile Reynaud (1844–1918) and, of course, the Lumière Brothers.

In 1870, fearing the Franco-Prussian war (1870–71), the Lumière family moved from Eastern France to Lyon. It was in the city center that Antoine opened his photographic studio. While running the studio, Antoine kept a watchful and excited eye on the education of Louis and Auguste. The two boys attended La Martinière, Lyon's largest technical high school. As a child, Louis was frequently troubled by headaches and had to spend much of his time at home, but, nevertheless managed to focus, very successfully, on inventions. As an adolescent, Louis designed the instant dry photographic plate christened the *Etiquette bleue* (blue label), which would amass the Lumière family fortune. With Louis's invention in hand, Antoine left the photo studio behind and acquired an extensive site on the outskirts of Lyon to manufacture and market *Etiquette bleue*.

In the summer of 1894, Antoine Lumière went to Paris and saw a demonstration of Edison's Kinetoscope. (In 1893, Edison had been granted a patent for "An Apparatus for Exhibiting Photographs of Moving Objects.") But the Kinetoscope was limited: only one person at a time could use the "peepshow" viewing

machine. The father of the Lumière brothers returned to Lyon and told them that they could do better than Edison. Antoine told his sons to get that image out of the box and they did.

In February of 1895, the Lumières received a patent for their invention of a lightweight (four kilos) motion picture camera: the Cinématographe. (Just as the etymology of photography is "light writing," cinématographe is "writing the movement"). On the sunny day of March 19, 1895, the Lumières managed to make the first film and marked the beginning of cinema. Their first film, *La Sortie des Usines* (*Workers Leaving the Factory*), was limited to seventeen meters of film and a time of no longer than fifty seconds, as was the case with all of the 1,408 little movies that the Lumières made with their Cinématographe. Shot by Louis (who was the principal filmmaker of the brothers), the famed brief movie features workers (mostly women) leaving the family's photographic glass-plate factory. Viewers witness the first characters, the first stars of cinema. *Workers Leaving the Factory* documented a simple piece of life, as did all of the Lumière films. Dramatic as their invention was, the Lumière Brothers did not see a big future with the Cinématographe. Like the Montgolfier Brothers and flight, the Lumière Brothers had "the genius for laying the intellectual foundation for a revolution" that would take place "elsewhere," in America (Gopnik, 151).

What was especially significant about the Lumière camera was that it could shoot, develop and, most importantly, project images onto a large screen. "This meant that the *opérateur* with this equipment was a complete working unit: he could be sent to a foreign capital, give showings, shoot new films by day, develop them in a hotel room, and show them the same night. In a sudden global eruption, Lumière operators were soon doing precisely that throughout the world" (Barnouw 1993, 6). Because they knew that most towns had no electricity, an ether lamp was used for projection. Viewers saw floods, crowds, men smoking opium, children running behind a rickshaw, trains coming and going, a gigantic ship, the drama and boredom of everyday life in Chicago, Mexico, Moscow, Jerusalem, China, Vietnam, Argentina, Algeria, Turkey, and Istanbul.

Not only did the Cinématographe give rise to the first newsreel, it also gave rise to the first family movie: as in the famous 1895 *Le Repas de bébé* (*Baby's Tea*) which features Auguste and his wife feeding their baby. Furthermore, given the Charlie Chaplinesque quality of many of their films, the Lumières can be credited with cinema's first comedies. Today audiences still laugh uproariously at the 1895 *Arroseur et arrosée* (*Watering the Gardener*): how funny the scene had to have been to an audience uninitiated in the world of cinema. In the 1896 *Démolition d'un mur* (*Demolition of a wall*), Louis made humorous use of what was originally an accidental projection in reverse: a wall is knocked down only to cinematically spring back up. Certainly, the youthfulness and lightness of the Lumière films was generated by the fifty-second format, the joyful mood of the Belle Époque, but also the spirit of two young inventors in their early thirties making art.

Not to be overlooked is the magnificence and formal precision of Lumière films. Louis was a great photographer and we see this in the "art" of the films that he made with his brother. In the hands of Lumière, a pair of opium smokers, tightly framed, shot with the camera low to the ground, is a work of staggering beauty. With its compelling use of a dramatic diagonal, Louis's 1895 *L'Arivée d'un train en gare* (*The Arrival of a Train*) is the first cinematic masterpiece. "The Lumières and their cameramen, utilized with glory the deep space and receding movement available to the camera lens, which had been ground in conformity with an idea of perspective emanating continuously from the Renaissance" (Sitney, x).

While there is general agreement that the Lumière Brothers can be credited with the invention of cinema, the process of getting to that first projection on March 22, 1895, (with the first performance to a paying audience, taking place at the Grand Café, 14 boulevard des Capucines on December 28, 1895), was a sorted and complex affair. Ingenious devices that preceded the Cinématographe (the term "cinématographe" is actually owed to Léon Bouly, 1892–93) were already developed earlier. Leading up to the invention of cinema were a range of important devices that contributed to the Lumières' Cinématographe. Most obvious is the invention of the camera obscura, the photograph itself and the magic lantern, but perhaps as important are the optical apparatuses that emphasized principles of movement. Critical here are Sir David Brewster's invention of the kaleidoscope in 1815, with its multiplication of imagery with precision, and Louis J. M. Daguerre's refinement of the diorama in the early 1820s that led to the multimedia diorama, "often sitting the audience on a circular platform that was slowly moved, permitting views of different scenes and shifting light effects." (Crary 1990, 113) In the early 1830s, Joseph Antoine Ferdinand Plateau invented the "phenakistiscope," which consisted of two spinning discs, one with a figure in a sequence of movements, the other with slits to look through. Utilizing a mirror and principles of retinal persistence, the observer sees a figure in animation (a girl jumping rope, a bird flapping its wings). By 1834, the similar devices of the stroboscope (invented by Simon Ritter von Stampfer) and the zootrope, sometimes called "the wheel of life," were invented. Charles-Émile Reynaud made the first animated films, which grew out of his 1877 "praxinoscope," projecting the first animated film in 1892. By

1888, Muybridge had learned to project sequences of his photographs on an adaptation of the magic lantern. Also in 1888, Étienne-Jule Marey used sensitized paper roll film to invent a camera that could take separate, but successive pictures on a moving strip of film. With this history in mind, it is noteworthy that Peter Kubelka notes that, in fact, cinema is "not movement…Cinema is nothing but a rapid slide projection. A slide projection which goes in a steady rhythm: twenty-four slides per second" (Kubelka 1978, 149).

Along with the Cinématographe, the Lumieres are well-known in the history of photography for contributing to the process of color photography with the invention of the Autochrome. An additive process, the Autochrome plate consisted of very fine grains of potato starch used with a gelatin silver-bromide emulsion. Autochromes were expensive and were unique images, best viewed as a transparency: their true colors were impossible to catch by the limited printing possibilities at the time. The Lumières' Autochrome plates went on sale in June of 1907. The process remained confined to Europe, especially France. The photographer Jacques Henri Lartigue made some of the most successful Autochrome images between 1912 and 1927.

In 1995, in honor of the Cinématographe's centennial anniversary, forty famous filmmakers (David Lynch, Spike Lee, Wim Wenders, Zhang Yimou, John Boorman, et al.) from around the world came together to create their own fifty-second Lumière film. Using the restored original camera forty intriguing films were made by and in tribute to the well-designed, trim, hardwood box with a hand crank.

Carol Mavor

Biography

Auguste Lumière was born on October 19, 1862, in Besançon France and Louis Lumière was born on October 5, 1864, also in Besançon. Along with their father they ran the very successful Lumière factory, which made its fortune from the innovative glass plate for dry-plate photography, the *Etiquette bleue* (blue label), which was invented by Louis when he was a teenager. The brothers are most famous for inventing "cinema" through the Cinématographe, which was patented on February 13, 1895. They shot their famous fifty-second *Workers Leaving the Lumière Factory* on March 19, 1895. The brothers also invented an early color photographic process, the Autochrome. For much of his life, Auguste worked tirelessly on medical inventions. After 1900, much of the production of the Lumière plant in Lyons was oriented towards medical research and production. Louis died on 6 June 6, 1948, in Bandol, France and Auguste died on April 10, 1954 in Lyon, France.

See also: Brewster, Sir David; Edison, Thomas Alva; Lantern Slides; Marey, Etienne Jules; Muybridge, Eadweard James; and Plateau, Joseph Antoine Ferdinand.

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LUMMIS, CHARLES FLETCHER (1859–1928)

American photographer, journalist, publisher

After graduation from Harvard College, Lummis took up a career as a journalist in Ohio. When offered a position in Los Angeles he walked across country and published the account of his journey, *A Tramp Across the Continent* (1892). He covered the Apache revolt led by Geronimo in 1885 for the *Los Angeles Times*, and renewed his interest in the cultures of the American Southwest. He moved to New Mexico for his health in 1887 and assisted archaeologist Adolph Bandelier for whom he photographed in the southwest and Latin America. His photographs served as the basis for the illustrations for an ethnographic study of Pueblo Indian people. In a five year period, 1888–1893, he photographed the land, people, and dwellings, the ruins and traces of past civilizations, and persistent rituals in the Southwest, Central America, and Peru. In all he made an estimated 10,000 glass plate negatives during his lifetime. Those made after his return to Los Angeles record the cultural heritage of southern California. He became the foremost proponent for the recognition and preservation of the unique cultural heritage of southern California and the American Southwest through his writing for *Century* and the illustrated magazine which he edited, *Land of Sunshine* (*Out West* after 1902) and his books, including *The Land of Poco Tiempo* (1893), and *Some Strange Corners of Our Country: The Wonderland of the Southwest* (1892). *Mesa, Canon and Pueblo* (1925), illustrated

with one hundred photographs, brought together thirty years of writing and photography on the region. The magazine *Land of Sunshine* became an important outlet both for his photography and that of others working in the Southwest. In 1907 he joined with others in Los Angeles to form the Southwest Museum which preserves important collections of Native American objects and holds a large number of his photographs.

KATHLEEN HOWE

LUTWIDGE, ROBERT WILFRED SKEFFINGTON (1802–1873)

English

Lutwidge was born in London on January 17, 1802, the second son of Charles Lutwidge and Elizabeth Anne Dodgson. His sister, Frances Jane, married a cousin, Charles Dodgson, and in 1832 gave birth to Charles Lutwidge Dodgson—the author and photographer Lewis Carroll. Skeffington Lutwidge was a favorite uncle of Carroll's and it was his influence that encouraged him to take up photography in 1856.

Lutwidge was a London-based barrister and commissioner in lunacy, he was a friend of Dr. Hugh Diamond and they were both members of the Photographic Society and the Photographic Exchange Club. His favored subject matter was architecture and in 1855 made an unusual study, in the rain, of the entrance to Knole Castle.

Lutwidge and Carroll often spent time together and on June 15, 1872, Lutwidge was photographed by his famous nephew at his Christ Church Studio in Oxford.

In May 1873 during a visit to Fisherton Lunatic Asylum at Salisbury, Wiltshire Lutwidge was attacked by patient William McKave and died six days later. Carroll's well-known poem The Hunting of the Snark, published in 1876, was inspired by his uncle's tragic death and experiences with the Lunacy Commission.

IAN SUMNER

LUYS, JULES-BERNARD (1828–1897)

French physician

Born in Paris in 1828, Jules-Bernard Luys attended medical school with the intention of becoming an intern in Paris in 1853. He obtained his doctorate in medicine four years later and became doctor in a hospital in 1862, occupying the postitions of head of department in Salpêtrière, and then later in Charity. An Anatomopathologist of development, his research was focused on the nervous system and the brain. Anxious to represent his findings as precisely as possible, he chose not to use traditional drawings or engravings but instead photography to display and capture his research. The first examples of these images can be found in a publication which Duchenne of Boulogne influenced him to choose as this new technique of representation was considered by many to be more accurate.

In 1873, he published photographs of the nerve centers in a text edited by Jean-Baptist Baillière. The work was composed of a book of text and an atlas comprising seventy photographs of cut and drawn brains on albumen paper. The photographs were taken in collaboration with George Luys (1870–1953), his son who was also a doctor. Encouraged by the success of this first work, Luys published two other works illustrated by photography as well.

DENIS CANGUILHEM

LYTE, FARNHAM MAXWELL (1828–1906)

French photographer

Born in 1828, Farnham Maxwell Lyte was a person of wide-ranging interests and an insatiable intellectual curiosity. He trained to be an Engineer at Cambridge University. In 1853 he traveled to Pau, France and made the acquaintance of—Jean-Jacques Heilmann and John Stewart, two photographers with whom his work is often associated. Lyte photographed both the natural and the man-made wonders of the Pyrenees.

One of the founding members of the Société francaise de photographie, Lyte had several of his photographs included in exhibitions from 1857 to 1874. He was also the inventor of what became known as "the honey process" a method of prolonging the sensitivity of coated glass plate negatives.

Most of Lyte's photographs are either salted paper or albumen prints and he worked almost exclusively with the wet-plate collodion process.His albumen prints are often easily identified by the red blind stamp on the bottom left or right hand corner of the print. He often inscribed his plates with the Latin phrase Lux Fecit (made by Lyte), a pun wittily alluding to both the act of photographing, and to his family name. He died in England in 1906.

PAULI LORI

M

MACFARLANE, SIR DONALD HORNE (1830–1904)

The son of a magistrate in Caithness, where he was born in July 1830, Macfarlane went to India in the late 1850s as a partner in the firm of Begg, Dunlop and Co., agents for tea and coal interests in the subcontinent. He appears to have taken up photography as an amateur soon after his arrival and the quality of his work attracted notice when he joined the Bengal Photographic Society in 1860. He remained an active and enthusiastic member of the society until his departure from India in 1864, winning numerous medals in its competitions and contributing several papers to its journal. The most important of these, *Landscape photography in India*, appeared in September 1862 and from 1863–64 he served as the society's president. Macfarlane's landscape work, small in quantity in terms of known examples, nevertheless reflects one of the freshest and most individual responses to the Indian landscape in the early 1860s and displays a remarkably modern compositional approach. Although Macfarlane continued with photography on his return to Europe and had his work shown at the Paris Exhibition of 1867, examples of this have not so far come to light: the scarcity of surviving prints has certainly led to an unwarranted neglect of one of the most individual photographic eyes in India in the 1860s. In his later years he served as Member of Parliament for Carlow (1880) and Argyllshire (1885, 1892), dying in London on 2 June 1904.

JOHN FALCONER

MACH, ERNST (1838–1916)

Moravian physicist

From early in the second half of the nineteenth century, photographers increasingly sought not just to decrease exposure times, but to shorten them sufficiently to be able to capture moving subjects with the crispness and full tonal range that was possible in a landscape view or a studio portrait. Gustav le Gray, Count Michael Esterhazy, Albert Lugardon, Ottomar Anschütz, and others achieved international recognition through their ability to depict movements in "instantaneous" photographs that recorded the natural motion of their subjects. The most spectacular instantaneous photographs captured movements too fast to be seen by the human eye, such as bullets or cannon shells in flight, and melded advanced photographic technology with a specialised optical apparatus developed by the professor of physics in Bonn, Dr. August Toepler, at the end of the 1850s and published in 1864. Toepler was interested in observing variations in the density of gases and fluids, and devised an apparatus where an "experimental space" containing his transparent media was framed by two plano-convex lenses on opposite sides, whose focal point was then observed by a further pair of enlarging lenses. The experimental space was lit from behind, and precisely half of the rays of its lenses were blocked by a shutter just at their focal point, in front of the observing lenses. With this specialised setup, any variation in the refraction of light passing through the experimental space caused by uneven density in the material showed up at the observation point as an unfocussed streak of light, and a Schlieren ("streak") apparatus became a standard laboratory instrument, not only for work on fluids but also for checking the imperfections of optical lenses. When a camera replaced the human eye at the observation point, and an electric spark provided appropriate illumination for a darkened experimental space, any fast-moving object that passed through the space, and the effects on the air caused by its movement, could be photographed, measured, and studied, given that a proper electrical circuit timed the release of the spark

just as the object was passing through the experimental space or Schlieren Head.

Beginning in 1884 Ernst Mach began using the Schlieren Method to photograph bullets fired by a pistol, drawn into a controversy about whether or not the French had used illegal explosive bullets, outlawed in the Treaty of St. Petersburg of 1868, during the Franco-Prussian war of 1870–71. New French rifles had caused extreme, crater-like wounds, and throughout the 1870s a number of explanations for the phenomenon had been put forward, including an idea suggested by Louis Melsens of Belgium that a spherical projectile carried compressed air with it in flight, the amount depending on its velocity. In his first experiments Mach saw no significant turbulence in the air because the bullets were travelling too slowly; he asked his colleagues Peter Salcher and S. Riegler at the Marine Academy in Fiume to continue his experiments, and they modified another Schlieren apparatus to Mach's specifications, photographing bullets fired from several types of rifles. In summer 1886 the shock waves from a bullet travelling faster than the speed of sound were photographed for the first time. Mach, assisted by his son Ludwig, then continued the experiments that autumn making more photographs of the air turbulence around a variety of projectiles, and even built a remarkable apparatus at the Krupp artillery range in Meppen where a 4 cm rapid-firing cannon was fired through a specially-built shed that provided the darkness needed to make a photograph where the plate was exposed by illumination from an electric spark. Mach began publishing his results with Salcher in 1887, and caused much excitement in both the scientific and photographic worlds. Ottomar Anschütz was inspired to make the only daylight photograph of a flying cannonshell in 1888, using specially designed weighted, pneumatically driven and electrically released focal plane shutters that operated at 76 millionths of a second at the Krupp Gruson works at Buckau-Magdeburg. Sir Charles Vernon Boys, who had made photographs of falling drops of water and other liquids by moving a photographic plate by hand through a camera while a slotted rotating disk shutter ran in front of his camera lens in the late 1880s, repeated Mach's Schlieren-method work in 1891 and 1892, producing photographs of bullets piercing a sheet of glass and other materials. Unusually, Boys used no lens in his camera, relying instead on the nearness of the bullet to the plate and his own improvements in the design of the electrical release mechanism, which much improved the briefness of his spark, to produce a defined image. Helmut Gernsheim's dismissive comment on the work of Mach and Boys, based on the fact that because the subjects were back-lit from behind the Schlieren Head the photographs produced only shadows of the passing object, seems today distinctly ungenerous. Their innovative technical expansion of the usefulness of photography not only led to specific scientific discoveries, but also gave new impetus to the field of electric-spark photography pioneered by Prof. Bernhard Wilhelm Feddersen in the late 1850s, and ultimately led to the striking images of Harold Edgerton at MIT in the 1930s and the development of modern stroboscopic flash units both large and small.

DEAC ROSSELL

Biography

Born at Turas, Moravia (today Czech Republic), Ernst Mach was educated at the University of Vienna, gaining his PhD in 1860. Four years later he was named professor of mathematics at Graz, and next took the chair of physics at the University of Prague in 1867, where he remained for the next 28 years. At Prague, Mach concentrated on experiments in psychology and perception, and worked on optics, mechanics and wave dynamics. He discovered the function of the semicircular canals of the ear; a phenomenon of the eye where it sees bright or dark bands near the boundaries between areas of starkly constrasting illumination, still called Mach's Bands; and first described the shock waves in the air that precede an object travelling faster than the speed of sound, leading to the colloquial expression of "Mach I" or "Mach II" for the speed of military and experimental aircraft. This last discovery was made in a series of trials using advanced photographic methods. Parallel with his experimental work in the 1880s, Mach proposed that all knowledge is derived from physical sensations, and began to argue for a rigorous interpretation of science based only on the interpretation of verifiable empirical observation. He further developed a radical concept of inertia, which he considered was exclusively a function of the interaction between one body and all the other bodies in the universe, a view which was not only controversial but which was one of the inspirations for Einstein's theory of relativity. His rejection of the existence of atoms, and his contention that matter was constructed wholly out of pure sensation was equally influential on the logical positivist philosophers, and embroiled him in vivid public disputes with Max Planck, Oswald Külpe, and even Vladimir Lenin. Mach's scientific legacy is principally as a philosopher of science although he always considered himself nothing other than a rigorous physicist. Moving to the University of Vienna in 1895, where he became professor of the history and theory of the inductive sciences, Mach began an intense battle against Einstein's theory of relativity which dominated his later work, even though he was partially paralysed by a stroke in 1901. Widely influential on European physics practitioners during his lifetime, his fight with Einstein ultimately eclipsed his reputation until recently,

when new theories about the properties and composition of sub-atomic particles have revived interest in his concepts.

See also: Le Gray, Gustave.

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MACKEY, FATHER PETER PAUL (1851–1935)

English-born amateur photographer

Father Mackey epitomises the private photographer: a learned scholar who knew the relevance of what he was looking *for* and *at*; precise, as befits the "age of the tripod," technically expert, poetic, he had a great love of architecture. A tireless walker, he made excursions throughout Italy, and to Sardinia and Greece, c.1884–1902, and because he travelled off the souvenir routes, he photographed many places not covered by commercial photographers. His depictions of the nuraghe in Sardinia are the earliest in existence. Equally rare is his record of the natural life of the Italian countryside, a subject not recognised by the professionals. Rarer still is the way he portrays the world for it is seen through the eyes of a Dominican priest who should not have been so interested in transitory, worldly things; self-portraits depict him deep in poetic thought in his flowing habit amidst pagan, classical ruins. Born Erdington, Birmingham, Daniel Mackey studied law (1869–1871) then the priesthood at Woodchester where, after becoming a Lector in Sacred Theology at Louvain in 1874, he taught philosophy and canon law until summoned to Rome in 1881 as editor of the Leonine edition of the works of St Thomas Aquinas which he continued for the rest of his life. He also associated with artists, such as Rodin, art dealers and collectors. He presented his photographic albums to the British and American Archeological Society of Rome (one remains). He gave to the British School at Rome c.1913 his negatives (now lost) and nearly 2000 prints, together with a detailed catalogue, which remained forgotten until 1999. They are now of great interest.

ALISTAIR CRAWFORD

MACPHERSON, ROBERT (1814–1872)

Scottish photographer who specialised in photographs of Roman architecture and antiquities together with topographical views

For approximately fifteen years, from c.1851 to c.1866, Robert Turnbull MacPherson was one of the most sought after photographers working in Rome. From the mid 1850s, John Murray began to publish favourable notices of MacPherson in his popular guidebooks and by the time of the 1858 edition, he was named as one of the principal photographic artists working in that city. MacPherson had relocated to Rome from Scotland in c.1840. His specialised in large format albumen prints. His preferred subjects were architecture, works of art and in particular sculpture, together with topography. These subjects found a quick and ready market with the international tourists that Rome attracted. MacPherson photographed elsewhere in Italy including Venice, Perugia and Assisi but it for his photographs taken in Rome and the surrounding Campagna that he is best known.

Born in Scotland in 1814, Robert MacPherson studied medicine at Edinburgh University to qualify as a surgeon. However his medical practice was short-lived as he became increasingly interested in art. He relocated to Rome in c.1840 and established himself as a painter. In the early 1840s he also started a business as an art dealer, although to what extent this was carried out on a regular basis remains unclear. In 1849 he married Geraldine Bate, a niece of the art connoisseur Anna Jameson. From Nathaniel Hawthorne's recollections of visiting her palazzo in 1858, it is also known that Jameson collected art. MacPherson appears to have had a strained relationship with his wife's aunt, so the question of to what extent, if any, Jameson introduced him to any of the distinguished members of her circle, such as the Goethe family, remains unresolved. However it might be significant that Macpherson included a citation from Goethe on the title page of his handbook to the Vatican Sculptures in 1863. Aside from any connections that Jameson's may have provided, MacPherson had his own very mixed circle of friends and acquaintances including George Combe, a co-founder of the Edinburgh Phrenological Society in 1820 and who conversed with MacPherson about sculpture, and the Scottish novelist Margaret Oliphant who referred affectionately to both Robert and Geraldine in her autobiography.

MacPherson appears to have abandoned painting in

MacPherson, Robert. The Theater of Marcellus, from Piazza Montanara. *The Metropolitan Museum of Art, Gilman Collection, Purchase, Alfred Stieglitz Society Gifts, 2005 (2005.100.59) Image © The Metropolitan Musem of Art.*

favour of photography by the early 1850s, although it is very likely that he had already begun to take photographs using the calotype process as early as the late 1840s. One or more calotypes associated with the activities of the Calotype Club of Edinburgh have a tentative attribution to MacPherson but may have been taken by James Calder MacPhail. They are consistent in format and general geographic location with a number of other calotypes which appear to have been taken by Sir James Dunlop during his Grand Tour of 1847. It is also possible but as yet unconfirmed that Dunlop introduced MacPherson to photography.

MacPherson's adopted the albumen process at the start of his commercial career and then progressed to the faster collodion-albumen process. He also experimented with modifications to photolithography and in 1853 obtained a patent for improvements employing bitumen. He went on to demonstrate photolithography at the newly formed Société française de photographie and at the Photographic Society of Scotland. MacPherson exhibited two photolithographs and five albumen prints at the British Association exhibition at in the showroom of Wylie and Lochead's Warehouse in Glasgow in 1855. He contributed an even larger representation of his photographs to exhibitions at the Photographic Institution in the same year and at the Photographic Society

of Edinburgh in 1856. His residency in Rome made it desirable to employ agents or other representatives including William Ramsey, Professor of Humanity at Glasgow University. Ramsey also described MacPherson's photolithographs to an international readership in *Frank Leslie's New York Journal* in 1856. MacPherson clearly valued his links with Scotland and kept in touch with and occasionally visited photographic colleagues there. In 1862 he also exhibited over 400 photographs in London in a gallery just off Regent Street and was present at the opening.

MacPherson favoured large format photographs which necessitated the use of long exposures. In 1862 he told *The Photographic News* that he employed an exposure time of five minutes for a distant landscape in good light but that between ten and twenty minutes were necessary for near objects. For some of the sculptures permanently housed in galleries, MacPherson stated that two hours or even two days were required to produce a good negative. Typically, MacPherson's photographs were mounted and carry his oval blind-stamp. These provide attribution but also chart the course of his various studio addresses. However it was at 12 Vicolo D'Alibert that he achieved much of his success.

Some of MacPherson's negatives bear his signature. Pencil reference numbers corresponding to his catalogues frequently appear on contemporary mounts. By 1863 he listed 305 photographs including picturesque local subjects such as "The Fish-Market in the Ghetto," as well as his usual historical themes. People rarely appear as he recognised that his customers wanted photographs of classical antiquities in Rome and nearby locations such as Terracina, Tivoli and Paestum, not life in a contemporary city. Nevertheless "The Valley of St. Anatolia with the new Railway Viaduct" indicated his preparedness to occasionally include some aspects of modernity. In a different vein, "Falls of the Terni" became on of the most famous waterfall photographs of the period.

MacPherson sold his photographs separately at a uniform price of five shillings but he also stocked ready-filled albums. Other customers evidently compiled their own albums frequently mixing MacPherson's photographs with those of his contemporaries such as Carlo Ponti. His photographs possess pronounced light and shadow effects and indicate a sensitively to both the monumental and the elemental aspects of the subject matter depicted. He did not have a standardised format, preferring to trim prints to achieve strong compositional arrangements. Helmut Gernsheim perceptively observed that his prints of surpassing beauty were not dependent exclusively on the beauty of the scenery.

Vatican Sculptures, a small volume with engravings derived from MacPherson's photographs and reduced down to miniature size by Geraldine was published in 1863 with a second revised addition appearing in 1868. A companion volume to the Lateran and Capitoline collections was planned but never materialised. However MacPherson clearly photographed at the Capitoline, as a two volume album exists in at least one copy with a bound-in pricelist dated 1871. MacPherson continued to sell works of art including fourteen examples to the National Gallery of Ireland and, famously, Michaelangelo's *The Entombment* which he purchased cheaply in 1846 and sold to the National Gallery in London in 1868 for £2000. MacPherson was disappointed that what had been known in the family as 'Geraldine's fortune' realised a smaller sum than he had anticipated, particularly when his photography business was showing signs of slowing down. His health also begun to fail at this time and he died in Rome on November 17, 1872.

JANICE HART

Biography

Robert MacPherson was born in Scotland in 1814. He studied medicine at Edinburgh University (1831–1835) but his medical career was soon abandoned in favour of a very different life as a topographical painter. He moved to Rome in c.1840 and established himself as a painter in oils and also started a business as an art dealer. The most significant aspect of his activities as a dealer was the purchase of a Michaelangelo painting in 1846 and its subsequent sale in 1868. He married Geraldine Bate, a niece of Anna Jameson, the expert in Italian art. MacPherson appears to have abandoned painting shortly afterwards and turned instead to photography. It is likely that he had already begun to take photographs using the calotype process by at least the late 1840s but in the early 1850s he had moved on to the albumen process and was to subsequently adopt the collodion-albumen process. His photographic business was founded on the production of large format prints of Roman architecture and antiquities, together with views of the surrounding Campagna. He quickly achieved commercial success. His interests extended to photo-mechanical printing. His modifications to the photolithographic process was patented in 1853. He exhibited regularly in 1850s and 1860s and achieved much critical acclaim. In 1863 he brought out a small handbook, *Vatican Sculptures*, containing illustrations derived from his photographs. By c.1866 his photographic business was still very active and in 1868 he sold an hitherto "lost" Michaelangelo painting to the National Gallery in London. In the late 1860s, both his business and his health were beginning to fail. He died in 1872.

See also: Calotype and Talbotype; Edinburgh Calotype Club; and Société française de photographie.

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MADDOX, RICHARD LEACH (1816–1902)

Richard Leach Maddox was born on the 4th of August 1816 in Bath, England. He traveled all over the world during the 1840s as a physician and worked for a few years in Constantinople (Turkey) before returning to England. He married twice, the first time in Turkey, to Amelia Winn Ford who died in 1871, and the second time in 1875, to Agnes Sharp. He traveled with his family, which included his three children. He returned to Southampton in England and ended his photographic activities in 1886 however he continued writing for scientific newspapers.

Richard Leach Maddox was not a professional photographer, instead he was more a scientist interested in photography and the science involved in its processes. As a scientist he is especially known for his work concerning microphotography and his research to improve the photographic process. In 1853, he began working with photography, particularly microphotography, in connection with his professional work as a scientist and exhibited his work that same year in the Photographic Society Exhibition in London.

Passionate for this kind of photography, Maddox translated Dr. Félix Dujardin's manual, *Nouveau manuel complet de l'observateur au microscope*, published in France in 1842 (*The New Complete Manual for the Microscope Observer*). The translated version never was published but he did write articles on this subject for the *British Journal of Photography* between 1855 and 1883. For his research in the beginning of the 1870s on atmospheric organisms, Maddox used an apparatus of his own design, called the "aeroconiscope" described by the *British Journal of Photography* as "a kind of multiple funnel set up as a vane. The wind traversing this instrument deposited the organisms on a thin coverglass duly prepared for the purpose" (*British Journal of Photography*, May 30, 1902, 427).

With this optical instrument connected to the camera, scientists were able to discover and study micro-organisms. During these years, they used a wet process to take photographs of their results.

Speed and picture quality were the most important topics for both scientists and photographers from the very beginning of the technique. The wet collodion process was the most sensitive technique at this time, but not practical enough because it had to be taken before it dried. At this time, the Taupenot process, also called dry collodion, was used as an alternative choice however it was a less sensitive process. A good photographic technique has to be practical and as fast as possible so researchers were always trying to improve the different processes.

One other important concern of Maddox's regarding photographic research was focused on the use of dangerous, chemical substances. His research, which required him to be at his microscope for hours up to sixteen hours a day in conjunction with him being around chemicals used for collodions vapor caused his health to deteriorate quickly. Maddox used ether to prepare his photographic plates, coating them with wet collodion and his failing health is the main reason the scientist tried to replace it in the process.

Well known from the beginning of the nineteenth century, gelatin was already being used in food and in photography (principally for photographic reproduction and impression). Maddox replaced the collodion coating with gelatin. He covered a glass with a mix of Nelson's gelatin and cadmium bromide. After drying, this plate was used as a negative, then developed with pyrogallic acid combined with silver nitrate and fixed with a sodium hyposulfite solution, which proved successful.

Maddox announced his discovery in the *British Journal of Photography*, the 8th of September of 1871, which soon was spread throughout Europe because of the various specialized newspapers and photographic associations. It's likely he realized the importance of his work, but did not follow up with improving the process. According to his notes, he did not have time to perfect it and let others scientists continue any further research.

From August 1873, the *British Journal of Photography* anticipated its future applications. Gelatin was a sensitive, fast, and dry photographic technique, which was also easy to prepare. Consequently, Richard Leach Maddox's discovery was the beginning of photographic industrialization, and one which caused a radical change concerning the picture's aesthetic due to the relatively short developing time.

Several scientists Jos. King, J. Burgess, and R. Kennett, improved the process before 1878, when Charles Bennett perfected actually perfected it by making it

more sensitive. This included warming the emulsion in a neutral medium for a few days at 32 degrees centigrade. Later, Bennett and few others like Désiré van Monkhoven, in Ghent, and George Eastman patented the process and sold readymade negatives plates.

The commercial development of the dry plate process eventually revolutionized the practice of photography, and the images produced by it. Amateur photographers did not need knowledge of chemistry or physics as this invention provided all that was needed, permitting anyone to practice photography.

Richard Leach Maddox received medals from different inventors exhibitions in Brussels, Antwerp, Belgium and the prestigious Royal Photographic Society's Progress Medal on February 12, 1901, for his research.

Maddox did not patent his various discoveries and inventions and did not make money from them as his motto was "if freely we have received, freely give" (*British Journal of Photography,* May 30, 1902, 427).

After his death on May 11, 1902, in Southampton, the *British Journal of Photography* noted that the community had lost the figure that changed photography from a long process to a more convenient one and that the part of photographic history, which had long been dominated by lengthy processes would be, for the "younger generation of photographers…ignorant of the slow and laborious manner in which gelatin photography was" (*British Journal of Photography*, May 30, 1902, 426).

MARION PERCEVAL

See also: Dry Plate Negatives; and van Monckhoven, Désiré Charles Emanuel.

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MAES, JOSEPH (1838–1908)

Belgian photographer, collotype printer, and publisher

Melchior Florimond Joseph Maes was born in Ghent on June 10, 1838. His first experiments in collodion photography took place in 1852. His precocious talents came to the attention of Désire Van Monckhoven, who then employed him as an assistant. Together they set up a studio for the production of stereo views which was a commercial failure, and their stock of negatives was sold to Gaudin in Paris.

Maes decided to open a portrait studio, while still harbouring ambitions in the nascent area of photographic printing and publishing. His studio opened in Brussels, at Rue des Fripiers 26, on November 22, 1858. He soon began supplying photographs for book illustration, his first two commissions, for the Brussels publishing house of A. Schnée, appearing in 1860—a deluxe edition of *Histoire populaire de la Belgique* [*Popular History of Belgium*] by Louis Hymans, containing eleven albumen prints, and a study *Exposition générale des beaux-arts à Bruxelles. Le salon de 1860* [*General Fine Art Exhibition in Brussels*. The 1860 Salon] by the art critic Max Sulzberger, containing four prints.

Maes formed a partnership with a certain Michaux (possibly a romantic interest) from September 1862 to August 1863 and moved premises to Rue Fossé aux Loups 36 Place de la Monnaie. This partnership, the sole example in Maes' long career, was clearly meant to lay the ground for a publishing initiative in the area of art reproduction, but proved to be short-lived. Instead, Maes went on to run the portrait studio alone, domiciled at the address from 14 October 1863. In 1864 and 1865, he published his first major work, *Album des objets d'art religieux du Moyen Age et de la Renaissance exposés à Malines en 1864* [*Album of Religious Art Objects of the Middle Ages and Renaissance* exhibited in Malines in 1864], a series of 57 albumen prints to commemorate a landmark exhibition of sacred art organised by the British historian W.H. James Weale.

Maes married Emma Strybos on 27 October 1863, and they had two daughters, Augusta born in 1865 and Julia in 1867. The family moved to Antwerp in 1866, where Maes acquired a portrait studio from Auguste Blanche (1818–1866) at Rue des Aveugles 1 / Place du Musée on 15 April 1866. His interest in photomechanical processes, a natural outgrowth of his activities in photographic publishing, dates from around this period. The considerable economies of scale afforded by the printing press were clearly demonstrated when the Brussels firm of Simonau and Toovey published a second edition of Maes' Malines album in 1866. Using their patented photolithographic process, it sold at 60 francs a copy, compared to the 200 francs which Maes charged for the original print-run in albumen.

Maes recognised the especial potential of the collotype process, using minimally adapted lithographic presses in general use. Following the Paris universal exhibition in 1867, at which Maes exhibited, he visited the printing works run by Tessié du Motay and Arosa in France, but was dissatisfied that the number of good prints per plate rarely exceeded 75, insufficient for industrial-scale production. When Josef Albert advertised his process in 1869, announcing print-runs of several

hundred, Maes opened negotiations to acquire the rights, but was unable to reach agreement. Maes set about "reinventing" the process, and by November 1869 had produced prints in the full range of halftones. During the following year the collotype workshop went into operation, and in 1871 Maes imported a steam-powered collotype press from Germany, the first of four.

Always the shrewd businessman, and chastened by the failure of earlier ventures, Maes retained the portrait studio, a sure source of income which he operated in parallel to his printing works throughout the 1870s. He offered to supply illustrations in collotype, *photo-autotypie* (carbon) and Woodburytype, presumably having acquired the hydraulic press for the process previously worked by Simonau and Toovey under licence up to the mid-1870s. Maes operated from Avenue de l'Industrie 24 from 1874 to 1881, and Rempart Sainte-Catherine 23 from 1875 to 1882, then sold the portrait studio at this address to his operator Georges Raynaud. From 1884 to 1895 he ran the collotype works from Rue Gramaye 10. Maes' work graced a broad range of art-historical publications, some of which he published himself. His most extensive achievement in collotype is the folio *Documents classés de l'art dans les Pays-Bas, du Xième au XVIIIième siècles* [*Schedule of Art in the Low Countries, from the Tenth to Eighteenth Centuries*], published between 1880 and 1889 and containing 720 plates with accompanying text by the architect J.J. Van Ysendyck.

As Maes secured his social standing within Antwerp society, so his public profile grew apace. He successively founded two reviews of the arts, *Revue artistique* (1878–1884) and *Chronique des Beaux-Arts* (1884–1886), supplying the illustrations from his own printworks. Joining the *Association belge de Photographie* (ABP) in 1882, he was appointed president of the Antwerp section on 6 December 1886, a post he retained as late as 1904, and held the presidency of the Association from 1889 to 1895. Chairman of the *Union Internationale de Photographie*, he hosted sessions in Amsterdam, Liège and Brussels between 1895 and 1897. He was awarded the Order of Leopold for his services.

Maes remained commercially and publicly active into old age. Although he relinquished control of the collotype works to George and René Dero from 1892 to 1894, he appears to have regained control at least for a short time around 1895. From his final address in Antwerp, Rue Rembrandt 33(3), he was registered as a person of private means, but became an agent for the Lumière company's "Cinématographe." He edited a fortnightly broadsheet *Journal de Photographie* from October 1902 to September 1905, and frequently exhibited as an amateur at the salons of the ABP.

Joseph Maes retired to the Antwerp suburb of Berchem on 7 June 1907 accompanied by his wife and unmarried daughter Augusta. He died on 4 August 1908, and was buried in Berchem cemetery. A dynamic figure in 19th-century Belgian photography, he had participated, in his various guises as photographer, printer, publisher, and increasingly successful entrepreneur, in many of the technical developments in photography for over half a century.

There are substantial holdings of Maes' work at the Bibliothèque royale Albert Ier—Département des imprimés, Brussels, Provinciaal Museum voor Fotografie, Antwerp, Stadsbibliotheek [municipal library], Antwerp, and Stadsarchief [municipal archives], Antwerp.

STEVEN F. JOSEPH

Biography

Melchior Florimond Joseph Maes was born in Ghent on 10 June 1838. Opening his first studio in 1858, he soon began supplying photographs for book illustration. Maes married Emma Strybos on 27 October 1863, and they had two daughters, Augusta born in 1865 and Julia in 1867. The family moved to Antwerp in 1866. Always the shrewd businessman, Maes recognised the potential of photomechanical processes. He set up a collotype printing works in Antwerp in 1870, which he ran for nearly twenty-five years. A key figure in 19th-century Belgian photography, Maes participated, in his various guises as photographer, printer, publisher, and increasingly successful entrepreneur, in many of the technical developments in photography for over half a century. Maes died on 4 August 1908, and was buried in Berchem cemetery.

See also: Gaudin, Marc-Antoine; Collotype; Albert, Josef; Woodburytype, Woodburygravure; and Lumière, Auguste and Louis.

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MALACRIDA, JULES (active 1840s–1890s)

French optician and photographer

Malacrida's date and place of birth remain unknown such as the elements about his childhood, training, death or possible heirs. Optician and daguerreotypist of the first times, he was active since 1840. Between 1848 and 1860, he cooperated with the Dr. Henri Jacquart to make daguerreotypes on anthropological pieces and animals from the *Museum d'Histoire Naturelle*. In *La Lumière,* Ernest Conduché spoke in praise of these works—for the major part collected in the *Catalogue des objets renfermés dans la Galerie d'Anthropologie du Museum du Jardin des plantes* (1857)—whose specimens were shown at the Academy of Science by Geoffroy Saint-Hilaire.

In 1850, he portrayed theatrical celebrities of his period and published a book dedicated to them with Charles Gabet. Set up at rue du Coq Saint-Honoré, 7, he was arrested in 1851 for distributing Félix-Jacques-Antoine Moulin's academic nudes. More severely convicted than the author—indeed, circulation was increasingly stigmatized by law than creation—Malacrida was condemned to one year of imprisonment and to pay 500 francs. During the trial, the President of the Seine Assize Court presented the incriminated photographs such as ''so obscene that giving their titles would be an outrage.'' Few years later, Malacrida associated with photographers and nudes diffusers addressed a petition to the Interior Minister to protest against the seizures they were subject. However, their petition to the authorities didn't receive the desired reaction, and consequentially their situation became one where with this petition, the government had at its disposal the names of the academic nudes actors market making it easier to target, control and censor their activities.

After this episode, he produced a series of portrait and scenic genre studies (36 negatives) entitled "Etudes d'après nature" published by Lemercier and registered for copyright purposes in 1853. This same year, he moved to rue de Vivienne, 12. Like his colleague Moulin, Malacrida started a more conventional career and left Paris for Toulon (south of France) in the beginning 1860's for an unspecified duration. He went on producing portraits, scenes of genre and negatives of monuments in collaboration with his wife. In 1870, he appeared once again at rue de Vivienne in the Parisian business registries and was supposedly active until 1895.

In 1980 and 1982, several Malacrida's daguerreotypes were sold respectively at Christie's (London) and Drouot's (Paris). At the moment, informations relating to his course and work are sparse and mainly combined with Félix-Jacques-Antoine Moulin's name and their justice issues.

FRÉDÉRIQUE TAUBENHAUS

Biography

Optician and daguerreotypist active from 1840 to 1895, he is essentially mentioned today for the diffusion of Félix-Jacques-Antoine Moulin's academic nudes and for the trial which resulted in 1851. Nevertheless, a major part of Malacrida's career has been dedicated to production of anthropological and zoological negatives, theatrical celebrities portraits as well as an important number of portraits, scenes of genre and photographs of monuments whose became his specialities, particularly after his justice issues.

See also: Daguerreotypes; Félix-Jacques-Antoine Moulin; and Nudes.

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MALONE, THOMAS AUGUSTINE (c. 1823–1867)

Malone was a competent chemist who worked with several early photographic processes but was usually remembered for his association with Talbot. Little is known of his early life. In 1844 he worked with Hippolyte Fizeau and Antoine Claudet etching daguerreotypes before being recruited by Nicolaas Henneman to work at Talbot's Calotype establishment at Reading. It was Malone that did much to refine and improve the Calotype process. When the establishment closed in 1847, Henneman and Malone opened a Calotype studio in London's Regent Street, which was funded by Talbot. Further support from Talbot allowed Malone to travel to Europe to meet distinguished photographic scientists. Around 1851 ill health caused Malone to leave the Regent Street business. After recovering, he became a lecturer and held posts at the Royal College

of Chemistry, the Royal Polytechnic Institution and the London Institution. He was a member of the Chemical Society and an active and often outspoken member of the Photographic Society of London.' When his post at the London Institution was abolished in 1864, Malone took a humble teaching job at a school in Clapham, South London. His health again became poor and in 1866, fearing for her safety and that of her five children, his wife committed him to Bethlem Hospital, a mental asylum. He died in Bethlem in 1867, a sad end that probably explains why his death does not seem to have been recorded in any major scientific or photographic publication.

JOHN WARD

MANN, MISS JESSIE (1805–1867)

Scottish assistant and photographer

Miss Jessie Mann was the assistant of the Scottish pioneering art photographers David Octavius Hill and Robert Adamson and one of the first woman photographers. She was born on 20 January 1805 in Perth, Scotland, the daughter of a house painter. She grew up there with her four sisters and one brother and her home was immediately opposite that of the family of D O Hill in a narrow street known as Watergate. When Jessie's father died in 1839 she moved with her two unmarried sisters, Elizabeth and Margaret, to live with their brother Alexander who had become a solicitor in Edinburgh. When Alexander married in 1842, the three sisters moved to a flat in Leopold Place, close to Rock House where Hill and Adamson set up their famous photographic studio.

Miss Mann in mentioned in two letters to D. O. Hill from his friend James Nasmyth dated 1845 and 1847. In the latter Nasmyth describes her as the "thrice worthy Miss Mann that most skilful and zealous of assistants." It is difficult to identify the photographs actually taken by Jessie Mann. It is recorded that on a tour of Britain the King of Saxony unexpectedly paid a visit to Rock House in 1844. The King of Saxony wanted to be photographed and as neither Hill nor Adamson were available "an assistant carried out the process." There are prints in the Scottish National Portrait Gallery. There are also photographs of the completion of the Ballochmyle railway viaduct in Ayrshire which could only have been taken in the spring of 1848 and Adamson had died earlier in January that year. These may also have been by Jessie Mann.

Like D.O. Hill Jessie and her two sisters in Edinburgh were supporters of the Free Church and Hill included them in his "Disruption" painting. It is said that two prints by Hill and Adasmon, one in the Scottish National Portrait Gallery and the other in Glasgow University Library, are of Jessie Mann. In both she wears a glove on her right hand and this could be to hide the stains of silver nitrate that would have been an occupational hazard for photographic assistants at the time.

When photographic activities ceased at Rock House following the death of Adamson, Jessie became the housekeeper of Andrew Balfour who ran a private grammar school in Musselburgh a few miles from Edinburgh. There is no record of her continuing with photography although she retained an interest and kept in contact with D.O. Hill. There is a personal letter to Hill from Jessie Mann in the archives of the Royal Scottish Academy dated 1856 which is in very person terms and refers to photography.

She later moved back to Edinburgh to live with her surviving sister. She died on 21 April 1867 a few months after suffering a stroke that paralysed her down one side. She was buried in the family plot at Rosebank Cemetery, Edinburgh. She never married.

RODDY SIMPSON

MANSELL, THOMAS LUKIS (1809–1879)

British doctor and photographer

Doctor Thomas Mansell was born on Guernsey in the Channel Islands in 1809, the eldest son of Rear-Admiral Sir Thomas Mansell and Katherine Lukis.

He was educated at Trinity College, Dublin and practised as a consulting physician as well as serving as a jurat (honorary judge) to the Royal Court of Guernsey.

Mansell, along with fellow photographers including Delamotte, Lake Price and Dr. Diamond, was one of the twenty founding members of the Photographic Exchange Club in the early 1850s. In 1854 he appealed for fellow members to supply lists of data regarding negative exposure time, development, paper manufacturer, maker,focal length of lens used, etc.

Mansell was interested in technical aspects of photography and experimented with different processes. Following his move from paper negatives to glass, he used his own 'syruped-collodion' formulae, which was convenient to use, but very slow.

A river scene, taken by Mansell in Northern France in 1856, was included in an 1857 Exchange Club album, complete with comprehensive technical information. Mansell used his syruped-collodion on a 11" × 9" glass negative (developed by pyrogallic acid) and the exposure was a full 47 minutes (in bright sunshine) with a 12.5" Ross lens. He used gold-toning to produce the finished print.

Mansell showed a selection of landscapes from glass negatives, all taken in the Channel Islands or northern France, at exhibitions between 1856–58.

IAN CHARLES SUMNER

MARCONI, GAUDENZIO (1842–1885)

Photographer

Gaudenzio Marconi (who appears in many writings under the first name, Guglielmo, is likely due to a confusion with the better-known Italian inventor) was born in 1842 in Switzerland, to a family of probable Italian origin. Few traces remain of the life of this author and his family.

Before becoming a photographer, Marconi is referred to in the documentation as an "artist-painter." Most of his photographs are images of nudes (albumen prints from wet collodium plates). During the period in which Marconi worked, nude photography was a widely popular genre, with frequently interwoven and overlapping variations in style and destination. Some of these photographs were made for private collections of a more or less openly erotic character (perhaps the majority of the daguerreotype nudes), but nude images were also frequently used in scientific journals in the fields of medicine, ethnography, and anthropology.

There was also a substantial production of these works made in photographic studios that became increasingly specialized. The work circulated in the form of actual catalogues and was destined for the use of artists, including painters and illustrators as well as for art schools. The major photographic studios, like Marconi's, that supplied this market also worked intensively on the business front. They would sometimes use external distributors for selling their works so that, once the works left the studio, they would then follow an independent course that might include many different passages. Given this scenario, it is easier to understand the reasons why certain situations occurred, such as the fact that Marconi acquired and sold some images by another well-known photographer, Auguste Belloc, under his own trademark, or the fact that some photographs taken by Marconi are either unsigned or attributed to his Austrian colleague Hermann Heid (owner of the major Viennese workshop specializing in the same kind of images), in a work such as *La Beauté de la Femme*, published by the Austrian Charles-Henri Stratz in a series edited by Paul Richer.

From the mid-1850s, the use of photographs in art schools became increasingly widespread and was a substitute for live models. At the *École des beaux-arts* in Paris specific classes were held in anatomy and morphology that relied on the use of large numbers of photographs. In general, nude drawing—the study of anatomical details and particularly representations of bodies in classical poses, the so-called *académies*—constituted a highly advanced level of teaching drawing. Starting from 1871, the Marconi studio mark bore the title "Photographe de l'École des beaux-arts," indicating his collaboration with that prestigious institution as a clear mark of distinction.

In relation to the work of other contemporary photographers engaged on the same theme, Marconi's photographs bear a number of distinguishing features. Firstly, his subjects: in a market that was heavily dominated by female nudes, Marconi often used male subjects. The compositions he created show particular attention to the plastic quality of the bodies, with a clear intent of highlighting the movements of the muscle masses. The subjects are almost always photographed against neutral backgrounds or simple landscape backdrops, making very little use of decorations or props except for a few essential drapes. The Michelangelo-style representation of the vigor and volume of the bodies comes through forcefully—contrary to the works of other artists—and excludes any evocation of unreal atmospheres or the adoption of sensual poses.

During this period, photography studios like Marconi's, increasingly open to models, artists, and decorators, were alive with all the debates and the technical and theoretical developments that characterized the artistic scene of the times, inevitably leaving a deep mark on the photographic works they produced. Evolving in close touch with this artistic climate, photography was sometimes reduced to an imitation of painting, while at other times it would develop absolutely original expressions that contributed to radically changing painting itself. In the images produced by Marconi, a strong innovation was introduced through the possibility of using photography to capture images of tensed bodies in positions that would have been very difficult for models to keep throughout lengthy painting sittings.

Like other artists of his generation, Gaudenzio Marconi left France in the 1870s due to the disastrous Franco-Prussian wars, which had a dramatic impact on the artistic community. The war left its mark on his work in a series of scenes that are quite exceptional in relation to the rest of his images (at least among those that have come down to us). This series depicts events relating to the siege of Paris, the most famous of which is *Pertes de la garde mobile après le combat de Châtillon*.

Records show that after 1870 Marconi was working in Brussels. Up to 1885, Marconi appeared in the commercial registry of Brussels, though as an artist resident abroad, working as both a painter and photographer.

This was the period of his collaboration with the sculptor Rodin, for whom he produced an image, the portrait of the soldier August Neyt (it is interesting to note that in this case he did not make use of a professional model), used for the creation of the sculpture *L'Âge d'airain* (*The Bronze Age*). Rodin also asked Marconi for a photographic reproduction of the work, which was presented in preview in Brussels in January 1877 and destined subsequently for the Salon of Paris. The Rodin Museum conserves two reproductions of *L'Âge d'airain* (front and back views) that bear the

stamp "Photographe des Beaux-Arts—Marconi—Place Gd Sablon 19—Bruxelles" on the back, as well as two standing portraits of the model, together with other photographs by Marconi with extensive cuts and pencil marks, testifying to the instrumental use of these images by Rodin and the collaborators of his *atelier*.

As far back as 1870, works by Marconi belonged to the collection of images coming from the legal deposit of the *École des beaux-arts* conserved at the *Bibliothèque Nationale de France* in Paris as well as in numerous private collections. His works often appear in catalogues of the galleries that deal in artistic photographs of the 19th century.

CLAUDIA CAVATORTA

Biography

Gaudenzio Marconi was born on March 12, 1842, in Comologne, in French-speaking Switzerland, to a family of probable Italian origin. He married Adrienne Fontaine, born in Amsterdam in 1844. As of 1862, Marconi, known as an "artist-painter" before becoming a photographer, worked in Paris, with studio at 11 rue de Buci. He specialized in photographs of nudes, which were mainly destined to art schools for teaching anatomy and morphology. As of 1869, in fact, he is registered as "photographe des beaux-arts," and from 1871 his studio trademark carried the title "Photographe de l'École des beaux-arts de Paris." In 1871, Marconi produced a number of scenes of episodes from the siege of Paris, and left France to move to Brussels. Initially he opened a studio in place du Grand-Sablon, and subsequently (as of September 22, 1876), in rue du Commerce. In 1877 he documented the sculpture *L'Âge d'airain* by Rodin. On July 23, 1879, he moved to Schaerbeck, on the outskirts of Brussels. Records show that he remained there until 1885, in rue Potter 5, working as both a painter and photographer.

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MAREY, ETIENNE-JULES (1830–1904)
French scientist

Etienne-Jules Marey was a scientist—what we would nowadays call a biophysicist—who used a camera in his life-long investigation of the physiological laws governing human and animal movement. His methods and images were remarkably influential in the histories of photography, art, aviation, military reform, moving pictures, physical education, and scientific labour management.

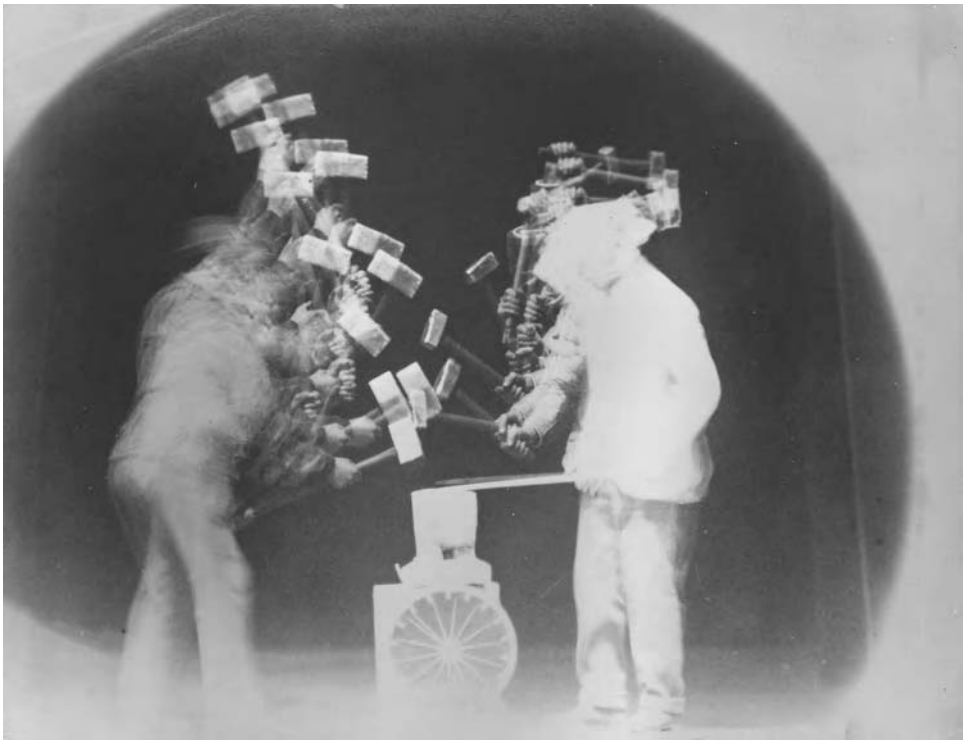
Marey was born 5 March 1830 in Beaune, capital city of wine-producing Burgundy in France. Following his father's wishes, he enrolled in Paris' Faculty of Medicine in 1849. He was drawn to the new science of physiology—the study of life processes—as a student, and after successfully passing his medical exams, he abandoned the life of a doctor for that of a physiological researcher.

Conceiving of the body as an animate machine run by a complex motor whose functions could be reduced to the newly discovered laws of thermodynamics—this was a radical concept in his day—Marey chose to study the body's most manifest form of energy: movement. He invented the graphic method, graphing instruments that traced the body's internal and external movements without interference by the practitioner. These are the mechanical ancestors of the electronic graphs and scopes universally used in medicine today.

The December 1878 publication of Eadweard Muybridge's series photographs of horses in the French journal *La Nature* showed Marey that photography could enhance the graphic method. In the winter of 1881–82 after meeting Muybridge in Paris, Marey made his first photographing instrument, a small rifle ("fusil photographique") that took twelve sequential images per second on a rotating glass disk. It was based on Jules Janssen's 1874 photographic revolver but was a notable advance, being portable, faster, and incorporating an automatic glass plate dispenser.

By summer 1882, Marey had moved his experiments to the Station Physiologique, the first large outdoor municipally-funded physiological laboratory in Europe built for him in the Bois de Boulogne. There he was aided by his talented assistant Georges Demenÿ and his mechanic Otto Lund. Marey spent each winter working on his photographic experiments at his villa in Posillipo, Naples, leaving Demenÿ in charge of the Station. This arrangement lasted until Demenÿ's 1894 departure in a disagreement over his commercialization of motion pictures.

Marey's photographic method, which he called chronophotography, was built upon his need to have what his graphing machines had provided: the visible expression of a continuous passage of time over equi-



Fremont, Charles and Etienne-Jules Marey. Trajectory of the Blacksmiths' Mallet and Hammer. *The Metropolitan Museum of Art, Purchase, The Horace W. Goldsmith Foundation Gift and Rogers Fund, 1987 (1987.1054) Image © The Metropolitan Museum of Art.*

distant and known intervals within a single tracing. He used a single glass plate in a single camera. Behind the camera's lens which was left open, Marey fixed a rotating metal disk shutter with from one to ten slots cut into it at even intervals. His subject—in these early experiments it was one of the soldier-gymnasts from the military school of neighbouring Joinville-le-Pont—was dressed all in white and moved in bright sunlight against a black background. As the shutter was rotated (by a crank) its slots exposed the plate, capturing the subject's movement as sequence of overlapping images.

To avoid the superimposition of limbs produced by too rapid shutter rotation, Marey devised a strategy astonishing for the way it operated against our usual understanding of the ontology of the photographic image, that is, that cameras inherently replicate all detail visible to the eye. He covered first half, and then the entire body of his subject in black and marked its joints in white. The resulting photographs rendered pure movement as graphic form.

With chronophotography Marey analyzed for the first time the mechanics of how we actually walk, run and jump and how the animals with whom we share this planet move. He also photographed the movement of the inorganic: the trajectories of projectiles, the geometric forms engendered by a string or wire moving around an axis, and water where there was no bearer or guide. In 1900 he moved into the area of aerodynamic forces, constructing the first wind tunnel in which he photographed smoke filets travelling around differently shaped planes.

In 1888 when paper negative stripping film appeared on the French market, Marey replaced his glass plate with a roll film and constructed a feeding mechanism for his camera. By early 1889 Marey had made a box to contain the bobbins, feeding mechanism and the film which he backed with opaque paper—one of the first examples of daylight loading film. His camera, films and the electric zoetrope he made to synthesize his films and photographs were the centre of the photography section at the 1889 Paris Exposition Universelle. And while Marey had no interest in reconstituting the illusion of movement, his work was the fundamental catalyst to all those like Edison, the Lumière brothers, and his assistant Demenÿ, who did.

Marey's graphing, photographing and cinematographing methods changed how the working body was conceived and how it was represented in both the social and aesthetic domains. He provided a scientific basis for developing the endurance of the soldier, and for the creation of a national physical education program in France. His instruments were used to analyze worker's movements and even to rationalize a physiological basis for psychology. After his death a new European science of work emerged out of his analyses. In America his separating of the phases of locomotive acts was complicit in the work of Frederick Taylor and his time-and-motion-study associates.

After Marey's death, chronophotography also influenced how the body was represented in art. The radical transformation of the experience of time and space created by the speed and pace of life at the turn of the

century, by the experience of the newly industrialized workplace, and by new technologies—the telephone, telegraph, automobile, phonograph and cinema, made Marey's chronophotography appealing to artists who sought ways of expressing modernity. For Marcel Duchamp, Franz Kupka and the Italian Futurists, in particular, Marey's chronophotography, both scientifically accurate and lyrically graceful, supplied a language with which to depict the kinetic and emotional dimensions of the subject, materialize the forces of the invisible, and give visible form to speed and dynamism.

MARTA BRAUN

Biography

Born 5 March 1830 in Beaune, Etienne-Jules Marey was the only child of Marie-Joséphine Bernard and Claude Marey. A researcher in the physiology of movement, Marey took up photography in 1882 as a way of expanding his graphic method of recording motion. Marey's contributions to medicine—he was a pioneer of cardiology—and physiology made him an important figure in the French scientific and photographic establishment . Elected to the Chair of "Organized Bodiesli" at the Collège de France in 1869 and the Academy of Sciences in 1878, he became president of that institution and the Société française de photographie in 1895. He was the author of more than three hundred scientific articles and seven books. He collaborated with Nadar, the Lumière family, Ottomar Anschütz, Gustave Eiffel and the aviation pioneer Victor Tatin. Marey died of liver cancer in Paris 15 May 1904.

See also: Londe, Albert; Chronophotography; Muybridge, Eadweard James; France; History: 7. 1880s; and Anschütz, Ottomar.

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MARGARITIS, PHILIPPOS (1810–1892)

Greek photographer

Philippos Margaritas is generally accepted as having been the first Greek photographer. Born in Smyrna in 1810, he spent his student years in Italy practising painting. In 1842, he was appointed teacher at the School of the Arts, where he taught Basic Drawing until 1863. He was introduced to photography in 1846–47 by the French photographer Philibert Perraud who visited Athens and within the next year he experimented with the new medium using a daguerreotype camera that had been offered to the School of Arts. In 1849, he opens the first photographic studio in Greece in the garden of his house on Klafthmonos Square. His themes were initially the ancient classical monuments and portraits of members of the royal court, fighters of the Greek War of Independence, politicians and ladies dressed in regional costume. Faithful to his training as a painter, Margaritis coloured over many of his early photographs with great precision and detail. He often travelled abroad and kept abreast of the most recent developments in photography. His frequent travels made it necessary for him to find a permanent partner for his studio. In 1870, he started his collaboration with the painter Ioannis Constantinou. Ten years later, Ioannis Lambakis became the firm's third partner.

ALIKI TSIRGIALOU

MARION AND COMPANY

Marion and Company was the largest and most important supplier of photographic equipment and material in Europe during the second half of the nineteenth century. By 1896, its retail catalogue ran to 135 pages, listing products that ranged from retouching desks to trimming knives. The frontispiece proudly declared that the firm had won nine medals for the work it had exhibited. These included awards at the Exposition Des Produits De L'Industrie (Paris, 1844), the Exposition De L'Industrie Francais A Londres (London, 1849) the Great Exhibition (London, 1851), and the L'Exposition Universelle (Paris, 1878).

Marion and Company was a French stationary and

fancy goods firm with outlets in both London and Paris. The French base of the firm was connected to Auguste Marion, who published several works on photography from the late 1850s onwards, often with particular reference to the paper used in the printing process. In 1856, an advertisement in the *London Post Office Directory* described the firm as "Stationers, importers of fancy goods and photographic papers." Based at 152 Regent St and 14 Cité Bergère, Paris, *Papeterie Marion* were, at this stage, still primarily importers of French luxury goods. They sold photographic paper alongside all varieties of decorated mourning and wedding stationery (their first advert for photographic paper in *The Times* was June 30, 1854). Their subsequent growth was a product of the commercialisation of photography during the late 1850s, and is a testimony to the high-quality albumen prints required by photography.

Marion and Company is often credited with introducing the *carte-de-visite* to Britain in 1857. They were the market leaders in the supply of celebrity photographs, a position that lasted for several decades. Throughout this period, they were located at 22–23 Soho Square, and they later had their own factory at Southgate in Middlesex. Marion and Company, a wholesale house, acted as both as a central supply point and as a distribution hub for many major photographers, including John Jabez Edwin Mayall, Camille Silvy, and the Southworth Brothers**.** Mayall was reputed to have been paid £35,000 by Marion and Co. during the 1860s for his *carte-de-visite* of the British royal family. The firm stocked thousands of celebrity photographs of every kind, in preparation for sudden changes in demand such as the death of a well-known figure. An article in *Once a Week* by Andrew Wynter described how Marion and Company made the celebrity *carte* into a modern phenomena:

> This house is by far the largest dealer in *cartes de visites* in the country; indeed, they do as much as all the other houses put together. The wholesale department of this establishment, devoted to these portraits, is itself a sight. To this centre flow all the photographs in the country that "will run." Packed in the drawers and on the shelves are the representatives of thousands of Englishwomen and Englishmen awaiting to be shuffled out to all the leading shops in the country. (Andrew Wynter, *Subtle Brains and Lissom Fingers*, 304)

Marion and Co. were instrumental in turning the *carte-de-visite* into a general consumer artefact. In 1862, their London manager, Mr. Bishop, stated that 50,000 *carte-de-visite* passed through the firm's hands every month. In later years they published their own sets of pictures such as "Marion's Series of Eminent Political Men" (24 × 18 inches and sold for between one and three guineas).

Marion and Company sold a wide range of photographic equipment and apparatus, particularly photographic albums and paper. The success of the *carte-de-visite* went hand-in-hand with the growing popularity of photographic albums for collecting celebrity and family photographs. Similarly, *carte-de-visite* themselves had to be pasted onto cards, which were often printed with the photographer's name on the reverse, often with additional decoration. Marion and Company's expertise as stationers and sellers of fancy good made them ideally suited to supply the burgeoning trade in printed photographic product. As the century progressed though, they slowly expanded their range of good, particularly in the 1880s and 1890s when the advent of dry plates helped to make photography accessible to a large number of amateurs. In 1884, they were advertising a complete beginner's set for £2 10s. By 1896, the cheapest "Nonpareil" introductory set was only 30 shillings. It came complete with camera, a dozen plates, lens, tripod, focusing cloth, and all the necessary solutions.

In 1884, *Marion's Practical Guide to Photography* was published, specially written for the use of amateurs. It was republished in 1885, 1886, 1887, and 1898, and was one of most successful photographic handbooks. A review in the *British Journal of Photography* declared that the book dealt "in a lucid and practical manner with the various operations connected with every department of the science while the *Queen* similarly noted that "A great many ladies practise photography, and they will appreciate the instructions here given."

At the same time as it tapped into the market for amateur photography, Marion and Co. continued to supply the professional studios with equipment like scenic backgrounds (£0 50s in the 1880s) and retouching apparatus. The firm supplied the latest apparatus by most other major photographic manufacturers, such as lenses by Ross**,** Voigtländers and Dallmeyer. However, it also took out several patents in its own name. In the 1880s, these included Marion's own "Parcel" detective camera, which had plates 4¼ × 3¼ inches, and was disguised as a parcel through being covered with brown linen paper and tied with string.

One technique that was re-introduced to great effect by Marion and Co. was the Cyanotype. In 1881, the firm reintroduced it under the name of the "Ferro-Prussiate or blue process." The process was used to make cheap reproductions of drawings, patterns and plans, and became popularly known as the "blueprint." The firm sold prepared papers to government departments, shipbuilders, railway companies, and architects.

Unsurprisingly, the firm remained especially pre-eminent in the supply of all forms of stationery connected to photography, particularly albums, printing paper and all types of card mounts. Its photographic mounts won a gold medal at the *L'Exposition Universelle* in 1878 and a silver medal at the London Inventions exhibition

in 1885. The albums of Marion and Company even attracted the attention of *Punch* in its edition of 24 December 1881:

> In acknowledgement of having produced the handsomest, most decorative, and most original Album for Photographs, we hereby decorate Mr Marion (of *Marion & Co.*) with his own patent clasp, and create him Duke of St Albums. The public will send him their orders.

Punch's comic praise testifies to the prominence and repute and of the firm. Marion and Co. reaped the benefits of being one of the first firms to treat photography as an industry.

JOHN PLUNKETT

See also: Cartes-de-Visite; Mayall, John Jabez Edwin; Silvy, Camille; Southworth, Albert Sands, and Josiah Johnson Hawes; British Journal of Photography; and Dallmeyer, John Henry & Thomas Ross.

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MARISSIAUX, GUSTAVE (1872–1929)
Belgian photographer

Born in Marles-les Mines (Pas-de-Calais, France) in 1872, Gustave Marissiaux was the youngest of three brothers and son of Gustave Léopold Marissiaux, a mining architect. In 1883, the family left France for Liège, Belgium, the region of origin of Marie Therese Micha, Marissiaux's wife. Once of age, each child of the family became a Belgian national.

In the beginning of the 1890s, Gustave Marissiaux chose to study law, but photography soon turned him away from it. In 1894, he became interested in photography, and was elected as a member of the Association Belge de Photographie [Belgian Association of Photography] (A.B.P.), the spearhead of Pictorialism in Belgium. A lecture Marissiaux gave in 1899 to the Liège section of the A.B.P., which was published the following year in the bulletin of the association, directly showed the photographer's interests. With the title "Art and photography it clearly defined the issues of artistic photography, like how to express, through the plasticity of the image, the personality of its author, or to reveal the "temperament" of the subject. To meet this criterion, Marissiaux drew on painting more than inspiration, as a method. Frequenting museums in Belgium and France led him to elect Corot, Delacroix, and Rembrandt as models. The study of their works guided Marissiaux to a deep understanding of composition and the relations between colours and work on shadows determined his approach of photography. Contemporary painters like Le Sidaner or his friends Auguste Donnay and Armand Rassenfosse, supported his look. It was therefore not surprising to find in his early works the influence of British Pictorialism, and particularly of Peter Henry Emerson. The country views that showed an isolated figure going about its duties ("Le Bûcheron" ["The Woodcutter"], 1896) recall the motives dear to the British photographer. The naturalism of the subjects evoked the open air painters and their will to find their sources of inspiration in outdoor sceneries, in opposition to academic staged imagery. But Marissiaux did not only share with Emerson this common reference to painting. His visual processing also related to the British master, through the attention given to the graduated shading, to light variations and to atmosphere rendering. One could read this in the numerous landscapes and forest interiors, with a hint of symbolism ("Coup de vent sur les hauts plateaux" ["Blowing wind on the Highland's"], 1901). By his platinum printings, Marissiaux gave these landscapes a dimension of mystery, which expressed a part of hidden, of unutterable, characteristic of the symbolist aesthetic.

Beyond these landscapes, Marissiaux also made portraits, both as a professional and as an artist. Although it might seem contradictory for a member of Pictorialism—that assumes the status of the "amateur," in the noble meaning of the term—Marissiaux opened a portrait studio in 1899. This professional activity that he apparently dissociated from his personal work, remained unrecognised, with most of the studio negatives being lost.

Nevertheless, portrait occupied a key position in Marissiaux's work. In the room of his studio, he devoted himself to "Studies," staging young girls whose attitudes denote an activity or a state of mind ("Liseuse" ["Reader"], 1899, "Mélancolie" ["Melancholy"], 1899).

A number of them allowed a purely photographic interpretation of forms and matters, and illustrate a work of lights and contrasts, as their title, "Studies," indicates.

Broadly spread in exhibitions organized by the A.B.P., but also in photographic exhibitions abroad such as Berlin (Royal Academy, 1899), Roubaix (International Exhibition of Photography, 1900), and Glasgow (International Exhibition, 1901), and printed in national and international reviews, Marissiaux's works give him access to unanimous recognition, making him a leading photographer of Belgian Pictorialism.

To these supports is added another one: the luminous projections. Organized annually by the Liège section of the A.B.P., they achieved open success by the general public. Marissiaux almost systematically took part in these projections, between 1894 and 1924. It is in that context that he set up, in 1903, a sort of "total spectacle" entitled "Venice." It proposed, in Liège Conservatory, a projection of photographic views of the lake city, accompanied with a poem recitation and music for choir, and orchestra, composed by his friend Charles Radoux. The new version of this show, presented in 1906, gave rise to no less than 26 representations, in Belgium and abroad.

Italy was for Marissiaux a genuine source of inspiration. From 1900 onwards, he travelled there every year, and visited most Italian cities of art. The photographs taken during these travels represented an important part of his work, consisting mostly of oily inks (Rawlins process). These allowed Marissiaux to dissolve details into an evanescent and coloured rendering that particularly suited the representation of Venice. He chose to regroup those Venice views in an homonymous album, published in 1907.

Surprisingly enough, the largest public success was brought by an order that orientated Marisisaux onto unexplored paths, namely social photography. Formulated by Liège Syndiciate of Coal Board, this commission consisted of illustrating the industry of coal mining in the Liège area. The photographer was invited to work with stereoscopy, to reinforce the impression of the spectator of a true immersion into the coal mining reality. Presented in 1905 at the Universal Exhibition of Liège, the result of this order was composed of 450 pictures, a third being stereoscopic views. Entitled "The Coalmine," this series also gave birth to gum-bichromate prints that became widely exhibited. Some of them also appeared in the album entitled "Artist's Visions." This portfolio reproduced in photogravure 30 pictures that retraced Marissiaux's career between 1899 and 1908.

The attractiveness of colour on the photographer manifested itself not only in his use of autochrome, in 1911–1912, but also in the experimentation with the process of a Flemish photographer, Joseph Sury. Allowing coloured paper prints, this experimental process still remains enigmatic today. Marissiaux applied it to the nudes as well as to genre scenes and landscapes, in the 1910s and 1920s.

Interrupted by World War I, Marissiaux's creative activity was bluredr in the course of the 1920s. As Pictorialism lost steam, the death of his parents and his wife pushed the photographer to become introspective, and he exiled himself to Cagnes-sur-Mer, in the south of France. He died there in 1929.

Presently, the Museum of Photography of Charleroi preserves the work of the photographer, except the negatives of the "Coalmine" series, which are deposited at the Musée de la Vie Wallonne in Liège.

DANIELLE LEENAERTS

Biography

Gustave Marissiaux was born in 1872 in Marles-les-Mines (France). He moved to Liège (Belgium) in 1883. As a law student, he took up photography in 1894, and was elected the same year to the Belgian Association of Photography (B.A.P.). His country views denote a symbolist influence. Portrait is also an important part of his work. He not only practised it as a professional, in the studio he opened in Liège in 1899, but also as an artist, in numerous "Studies." Recognized as one of the most important Belgian Pictorialist, he not only took part in the national Salons of the B.A.P., but also in several European Salons. By combining photography projection, poetry and music, he created a new form of "total spectacle," based on his images of Venice (1903). A public order was addressed to Marissiaux by the Syndicate of Coal Board. This series of stereoscopic views entitled "The Coalmine," and the album "Artist's Visions" (1908), are Marissiaux's most well-known works. He also elaborated a colour technique with the collaboration of Joseph Sury, in the course of the 1910's and 1920's. Exiled in Cagnes-sur-mer (in the south of France) in 1925, he died there in 1929.

See also: Pictorialism.

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MARKETS, PHOTOGRAPHIC

When Louis-Jacques-Mandé Daguerre and William Henry Fox. Talbot announced their eponymous processes, neither could have envisaged the range of markets to which their inventions would be applied before the end of the century—although both men offered some early suggestions. Daguerre foresaw the primary applications of his invention being of benefit to travelers, archaeologists and naturalists—as well as the more obvious uses such as portraiture.

Also foretelling the public's enthusiasm for portraits, landscape and pictures of buildings and places, Talbot additionally predicted some novel applications of his invention. In *Pencil of Nature* (1844) he not only pioneered the photographically illustrated book as a potentially massive market for photographs, but suggested, amongst other applications, that a photographic inventory of a collection of antiques would be infinitely more useful than a written one, asking his readers, "'and would a thief afterwards purloin the treasures—if the mute testimony of the picture were to be produced against him in court—it would certainly be evidence of a novel kind?"

Others were just as enthusiastic about the potential applications of photography. The Scottish engineer Alexander Gordon, suggested to the Institution of Civil Engineers in London as early as 1840 that photography would enable "views of buildings, works, or even of machinery when not in motion, to be taken with perfect accuracy in a very short space of time and with comparatively small expense."

Such a use of photography, he suggested, would be of great value to architects and engineers, especially when managing projects at a distance. History proved him correct. The minutes of the first meeting of the newly formed Photographic Society of London on February 3, 1853, record that the engineer Charles Blacker Vignoles, who,

> … made a few remarks in illustration of the great service which the new art would be likely to render to engineers and others having to superintend important works which they could only occasionally visit, or having to make intelligible to foreign employers speaking a different language, with whom they could interchange ideas only imperfectly in conversation, the details of blocks and ropes, and complicated constructions.
>
> He instanced the pictures taken of the works now going on at Kieff for the suspension bridge he was erecting for the Emperor of Russia, over the Dneiper, on which photographic views had been taken weekly during the whole time of its construction, and especially of the method of raising the chains from the first tightening of the ropes to the final elevation of the whole to its proper position, which have been shown with the greatest accuracy and detail.

Here he was referring to the work of John Cooke Bourne, who reportedly chronicled every stage in the bridge's construction through to its opening later that year.

By the end of that decade, industrial photography had established itself as an essential market for photographers worldwide, with progress photography becoming an essential feature of every major construction project, from Ben Mulock's images of the construction of the Bahai Railway, 1859–1862 (another Vignoles project), through to Evelyn Carey's record of the construction of the Forth Bridge in Scotland as the century drew to a close.

The accuracy and reliability of the "evidence" offered by a photograph inspired and drove most early commercial applications. The first photographs brought back from ancient Egypt were avidly collected by academic institutions and scholars, who saw the value of the photographs as enabling studies to be undertaken without the time and expense incurred in actually visiting the locations. The subscription list for Francis Frith's *Egypt and Palestine Photographed and Described* (London, James S. Virtue, 1857), for example, includes many universities and colleges, and many leading academics, alongside the rich and influential.

Roger Fenton's contracts with the British Museum in the 1850s permitted the establishment of an independent sales point within the museum foyer, through which Fenton sold copies of many of the images of museum objects which the Trustees had commissioned him to produce, thus establishing the prototype for today's ubiquitous museum shop. This took the marketing of images of antiquity one stage further as, in addition to sales to academics and specialists, these photographs were sold to the more affluent members of the museum-visiting general public.

Just as with the Egyptian images of Frith and others, many of Fenton's commissions for the British Museum were published in bound editions. His 1856 photographic copies of the Museum's *Clementine Epistles* were produced in an edition of fifty sets, with printed introduction and bound in blue covers. Again, like Frith's Egyptian volumes, these were predominantly sold to museums, universities and wealthy historians, with at least three copies going in to the Museum's own library.

Photography was first exhibited at London's Hyde Park Great Exhibition of 1851, and by the time of the Exposition Universelle in Paris four years later,

commercially produced stereoscopic daguerreotypes, ambrotypes, and glass diapositives of the displays were available for sale, alongside paper prints from glass negatives, at special booths inside the exhibition halls.

By the time of the Centennial Exhibition in Philadelphia in 1876, the use of photography at exhibitions had been further extended by William Notman, with the creation of photographic identity cards for the exhibition staff and exhibitors, initiating the huge market for ID cards that now exists.

Today's market for photographs as advertising can trace its genesis back to the very earliest days of the medium. Daguerreotypes of industrial machinery, clocks and watches, and other commercial products, survive from the early to mid 1850s, the purpose for which can only have been promotional. By the height of the *carte-de-visite* era, the ubiquitous paper print format was also being widely used to allow travelling salesmen to demonstrate the full range of products from the companies they represented—and without the cumbersome bulk and weight of daguerreotypes.

The daguerreotype also played a limited but nonetheless significant part in the introduction of photography for the expanding tourist market mid-century—the most notable example being the concession operated at Niagara Falls by Platt D Babbitt, creating the ultimate memento of a visit, with the tourists posed against the magnificent backdrop.

Once the high cost of large paper prints began to decline in the 1860s, and the higher costs of travel declined as well, the advent of cheap rail travel—especially in Europe—and the parallel introduction of cheaper photography, created a vast market for tourist imagery. This market was dominated by, amongst others, such figures as Samuel Bourne in India, Francis Frith and George Washington Wilson in Britain, William Notman in Canada, Kusakabe Kimbei in Japan, the Adelphoi Zangaki, Pascal Sebah and others in Egypt, and Carleton E Watkins and others in America. Especially along the routes of the European and Middle Eastern Grand Tours—which grew in popularity from the 1860s—numerous photographic studios were established explicitly to cater for the growing tourist market.

The *carte-de-visite* was more crucially influential in the popularisation of the tourist image—and can be seen as the direct predecessor of the picture postcard market which emerged as the nineteenth century drew to a close and which dominated the twentieth century. The much lower price of the *carte-de-visite* and the common format with the family album ensured that the tourist image became just as much a part of family history as the portrait.

The first, and most obviously popular, market to be exploited commercially was, of course, portraiture, and the world's first professional portrait studio was opened by Alexander S Wolcott and John Johnson on March 4, 1840. The New York *Sun* carried an account of the opening:

> Sun Drawn Miniatures—Mr A. S. Wolcott, No. 52 First Street, has introduced an improvement on the daguerreotype, by which he is enabled to execute miniatures, with an accuracy as perfect as nature itself, in the short space of three to five minutes. We have seen one, taken on Monday, when the state of the atmosphere was far from favourable, the fidelity of which is truly astonishing. The miniatures are taken on silver plate, and enclosed in bronze cases, for the low price of three dollars for single ones.

The first photographic studio opened in France is believed to have been that of Nicholas-Marie Paymal Lerebours, which operated from late spring 1841, but Richard Beard opened what is believed to have been Europe's first professional photographic studio at London's Royal Polytechnic Institution, on March 23, 1841, just a few weeks earlier than Lerebours.

High costs limited the market for photographic portraits in the early years largely to that stratum of society which might previously have aspired, even if it could not quite afford, to have a miniature painting made. It would be the 1860s before reducing costs, simplified techniques and processes, and the advent of the populist carte-de-visite saw the portraiture market burgeon.

By the end of the nineteenth century, most cities were heavily over-populated with photographic portrait studios—many of which would never achieve a level of financial viability. In London, for example, from Beard's original studio in 1841, the number of active photographic studios in the city had swelled to almost three hundred.

Wedding photography, today one of the mainstays of the profession, first came into popularity in the mid 1850s. Bridal portrait and full-length daguerreotypes by Southworth & Hawes of Boston survive from c.1854, with other portraits of wedding couples by unknown photographers surviving from the same period. While some of these earliest examples of the genre show the bride in a wedding dress, the majority of early wedding photographs were taken after the event, with the bride and groom, hands interlinked, presenting the bride's left hand and wedding ring to the camera. In many early daguerreotypes and ambrotypes, of course, with their lateral reversal of the image, it appears to be the bride's right hand which is offered to the lens.

Four years later, in 1858, the wedding of the Princess Royal, the eldest daughter of Queen Victoria, was photographed by Caldesi, whose pictures included the eighteen year old bride with her parents, and a group picture of her eight bridesmaids. Indeed Queen Victoria, a staunch supporter of early photography in general, also did much to popularize the wedding picture in

Britain. To mark her fourteenth wedding anniversary in early 1854, she and Albert posed before Roger Fenton's camera as if they were a wedding couple, Albert in full dress uniform—black boots replacing the white leggings of his wedding tunic—and Victoria in a simplified recreation of her 1840 wedding dress.

Within a decade, with photographs of Royal weddings widely available as cartes-de-visite prints, the popularity of the wedding photograph had started to grow exponentially. From the mid 1860s, photographers regularly advertised 'wedding groups' in the range of commissions they undertook, and by the end of the century the wedding photograph was an expected part of marriage costs. The specific album of wedding photographs, while not unknown in the nineteenth century, was largely a twentieth century innovation.

After the wedding, the photograph of the baby was an obvious market to develop, and with child mortality much higher in the nineteenth century, deathbed portraits of children also proved a significant if somewhat macabre market for the high street professional. In the event of unexpected infant death, the deathbed portrait often proved the only tangible proof that the child had ever lived.

Socially, the photograph as entertainment also provided a lucrative market for photographers—especially with the introduction of the drawing-room stereoscope in the 1850s. Companies such as the London Stereoscopic & Photographic Company in Britain, and Underwood & Underwood in America, published sets of stereo cards on a wide range of subjects including humour, religion, travel, and news. Individual stereo cards were available for sale from photographers and print-sellers, and specialist journals such as *The Stereoscopic Magazine* further popularized the medium.

In the days before the advent of the half-tone illustration in newspapers, boxed sets of stereoscopic views of important events and news stories would be marketed very quickly after the event they portrayed. Often sold in boxes resembling leather-bound books, these sets sold in large numbers despite the fact that they commanded a high price.

The market for photographically illustrated books was one of Henry Fox Talbot's early predictions, and despite the high cost of his 1844 *Pencil of Nature*, it established a market for photographers which has grown ever since. While such volumes were restricted by the need to paste in real photographic prints, costs were high and production runs small, but the demand grew consistently. With the advent of the Woodburytype in the 1870s, production became somewhat easier, the permanence of the images considerably better, and the number of illustrated books published annually considerably greater.

JOHN HANNAVY

See also: Babbitt, Platt D; Beard, Richard; Caldesi; Bourne, John Cooke; Daguerre, Louis Jacques Mandé; Expedition Photography; Exposition Universelle, Paris, 1855; Fenton, Roger; Frith, Francis; Lerebours, Nicholas-Marie Paymal; Photography as a Profession; Talbot, William Henry Fox Talbot; Travel Photography; Underwood & Underwood; Vignoles, Charles Blacker; Wilson, George Washington; and Woodburytype.

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MARTENS, FRIEDRICH (1809–1875)
French inventor and photographer

Friedrich Martens (sometimes incorrectly styled as von Martens), a resident in Paris presumed to be of German origin, designed and built the world's first daguerreotype panoramic camera in the 1840s, the first camera capable of taking, with a single exposure, a view wider than the field of vision of the human eyes.

The camera had a field of view of 150° and a geared mechanism for rotating the lens which required the controlled turning of a small handle at the side of the camera. The lens, pivoting around its centre, was connected to the camera body by a flexible leather front sleeve. At the same time, a 'v' shaped aperture traversed the curved plate making the exposure, effective exposing the sky to a smaller aperture than the foreground, and overcoming the daguerreotype's tendency to solarised in the over-exposed sky. The camera manufacturer was Paris instrument-maker, N. P. Lerebours.

By 1851 he was using collodion, and was awarded a medal for his "talbotypes on glass" [sic] at the Great Exhibition which read "for richness, effect and perfection of definition, they are the finest specimens it seems possible to produce."

He joined Léon Méhédin in the Crimea photographing scenes of the conflict, subsequently published by Bisson Frères, both men later working with Jean-Charles Langlois producing panoramic images during and after the same campaign.

JOHN HANNAVY

MARTIN, JOSIAH (1843–1916)

English-born author and publisher

Josiah Martin (1843–1916) commands high respect and a special position in the history of development of new Zealand photography. A Londoner by birth he came to New Zealand in the 1870s to establish a College of Education in Auckland. For various reasons he gave this up and turned to photography. Eventually Martin became heavily involved with an area in the middle of the North Island called the Hot Lakes District. Over a short period of time, he wrote, illustrated and published several pamphlets, papers and booklets which sang the praises of the districts tourist potential. In 1889 his work in this direction was rewarded with him being elected as the president of the Auckland Institute and Museum. Another great achievement saw him appointed to the post of editor for *Sharland¹s New Zealand Photographer,* a journal which he edited for many years. During his tenure in this position, he advocated vociferously for the injustices that were being dealt to photographers when it came to taxes and government inaction on matters that threatened their copyright over their images. He was also one of the first photographers to make extensive and tours of some of the Pacific Islands with his camera. The results of these excursions were turned into illustrated lectures with the use of a magic lantern.

William Main

MARTIN, PAUL AUGUSTUS (1864–1944)

French photographer and wood engraver, resident of Great Britain

Growing up in an era of political, technological and cultural change, Paul Augustus Martin holds a pivotal position in the evolution and growth of modern photography. Although a Frenchman by birth and by choice (he retained his natural-born citizenship throughout his life), Martin emigrated to London, England, in his youth and became a permanent resident of that city for the remainder of his life. The majority of his education, the home of his family, and the basis of his commercial and artistic life would all emanate from and resound throughout Great Britain.

Martin was born in the village of Herbeuville, France, on April 16, 1864, but at the age of five he moved with his family to Paris. The timing could not have been worse as the city endured the joint horrors of the Franco-Prussian War of 1870 and the misadventure of the Paris Commune in 1871. The family, including young Paul, faced tragedy (the loss of his younger sister) and near death on numerous occasions and immigrated to London by 1872. There the family was able to make a permanent home and Paul prospered as a student, fascinated with sports and excelling in mathematics and drawing. Following a brief period of attending preparatory school in France, he completed his private school education in London and passed his exams in 1880.

Deciding to pursue his drawing talents, Paul apprenticed himself to a wood engraver in 1880, became a professional in 1883, and excelled in the heyday of this art throughout that decade—wood engraving enjoying a popular period of growth in the illustrated press of the day. It was also during this same decade that Martin became fascinated with amateur photography, learning the technology of dry plate processing on his own and purchasing his first camera, a quarter-plate Le Meritoire, in 1884. For the next four years he continued to work in the circles of his wood-engraver friends, employing the camera on a very limited basis for holiday outings, camping trips and vacations. Despite the limitations his amateur album of this period displays a fine technological skill and a careful professional eye, probably derived from his artistic education and experience.

By 1888, however, things began to change rapidly. Martin discovered the ever-burgeoning amateur photography movement in England with its proliferation of photographic journals and its explosion of photographic salons and camera clubs with their interesting speakers, debates and competitions. It was a dynamic period in photography's history with its established pictorialists and "old-school" photographers facing the dramatic aesthetic and cultural changes being wrought by the myriad new camera and processing technologies of the era. Not of the class or the wealth to engage in the Pictorialist traditions of the masters of the age, Martin applied himself to newer aesthetics that the dry-plate (and later the roll-film) cameras were establishing. By 1889, when he won his first amateur photographic competition, he was hooked.

The decade of the 1890s would mark the time of his greatest proliferation as well as personal change. Martin still worked as a wood engraver, but he took his cameras everywhere—and the resultant imagery reflects both his excitement and mastery of the new medium and a growing understanding about the vast potential of an era of massive photographic change. During this mature amateur period he became an active figure throughout the London camera clubs and salon exhibitions—always coming up with new original imagery and trying new techniques. His purchase in 1890 of a Facile camera (a dry-plate instrument that could be concealed in a nondescript bag and could handle up to 12 exposures) led him out into the streets of London where he captured candid photographs of "London street types" which had not been seen before. The work, while fitting somewhat into the earlier documentary traditions of photography, was clearly innovative, aesthetically mature and definitely unlike any such imagery that had come before. The street types—often manipulated with hand-drawn bases and

dubbed "living statues"—were the hits of many lantern slide evening presentations and gained Martin important notices and awards at the time. He would amplify the work to more expansive environments when he also carried the hidden camera on vacations to other British locales such as the port of Whitby, the beaches of Yarmouth, and even on Swiss vacations.

The other innovative pioneering work for which he became famous derived from his continuing fascination with the aesthetic applications of newer technological innovations. Martin experimented with a variety of nature phenomena—waves at sea, dawns and sunsets, and long exposures—before he hit upon his most resounding work: night photography. Finding new ways to handle such traditional nighttime problems as halation, exposures and incidental light, the photographer began in 1895–96 to produce elegant and complex images throughout the rain-covered, foggy streets of an urban London that was itself in the days in which gas lighting was being transformed by electricity. Martin's "London by Gaslight" won him the widest fame of all, as well as the gold medal of the 1996 R.P.S. annual exhibition and the notice of the established Pictorialists of the day. No less a figure than George Davison offered Martin a position with the rapidly growing Eastman Kodak Company in 1898.

By the century's end, however, Martin made a deliberate professional choice himself. In 1899, he sensed the end of his profession of wood-engraving in an era in which press illustrations were being transformed by photomechanical reproductions of the photographic image itself. Together with Henry Gordon Dorrett he established a professional firm—variously known as Dorrett & Martin or as Athol Studios—that featured everything from freelance press photography to commercial processing and even specialized applications for portraiture such as photo-buttons and other miniature novelties. Although the enterprise was apparently highly successful from a commercial perspective, it effectively ended all of Martin's serious photography. Although he never abandoned making his own photographs—his later work includes pictures of the street and of sporting events as well as more holiday travels—he maintained his time and focus upon running the business.

At the end of 1926 Dorrett & Martin closed their doors. In old age Martin was eventually rediscovered by the camera clubs—which engaged him to give entertaining lectures based upon his Victorian era photographs—and numerous publishers which featured his work and/or reminiscences in newspapers, magazines and books of the day. In 1939 (photography's centennial year) he was encouraged and assisted by C.H. Gibbs-Smith, Research Fellow at the Science Museum, to publish a small autobiography, *Victorian Snapshots*, which would introduce his innovative "amateur" work to an entirely new generation of photographers. He lived in retirement with his two sons and, perhaps ironically re-haunted by the wars of his youth, passed away from natural causes during the London Blitz on the evening of July 7, 1944.

Martin's original prints are found in many important collections around the world. The main bulk of his amateur imagery—prints, negatives, lantern slides and an early album—form an important part of the Gernsheim Collection at The University of Texas at Austin. His manuscript diary and albums of wood engravings and other prints are in the possession of the Fine Arts Library, University of New Mexico General Library, Albuquerque. A large collection of imagery collected by the Royal Photographic Society, is now housed in the National Museum of Photography, Film and Television in Bradford.

ROY FLUKINGER

Biography

Paul Martin was born in rural France in 1864, and moved with his family to Paris in 1869, in time to survive the dangers of both the Franco-Prussian War and the Paris Commune in the following years. The family then moved to London, which would become Paul's adopted home for the remainder of his life. Combining a talent for drawing together with top grades in London and Parisian schools, he apprenticed himself to a Fleet Street engraving firm in 1880. His childhood fascination with the visual world eventually led him to become interested in amateur photography and to purchase his first dry-plate camera in 1884. Throughout the 1880s Martin joined photographic societies, read all he could about the technology and art of the medium, and honed his own skills on holidays and street scenes. The 1890s would mark his mature amateur period, during which he experimented with various light effects and documentary imagery—as well as doing revolutionary work in the areas of night photography and candid street images (made with a concealed plate camera called the Facile). During this same decade, he won both a certain fame and many awards from various amateur competitions throughout a number of London salons and camera clubs. Most critically of all, he came to recognize that his own profession of wood engraving was being replaced by photography and the increased use of such images in the popular photomechanical press of the day. In 1899 he made the jump, opening a firm in partnership with Henry G. Dorrett that featured everything from freelance press photography to commercial processing and specialized applications for portraiture such as photo-buttons. Although he never lost his aesthetic eye and always continued to experiment with the latest technological innovations, the management of his business cut deeply

into his own image-making and his commercial career soon undercut his active photographic endeavors. While never giving up entirely on photography, he closed down his business in 1926. He spent the remainder of his life reviving his early street photography of the late Victorian era, saw many of his pictures published in the popular press, and became a favorite lecturer in his beloved camera clubs showing his images and relating his experiences. He published his autobiography in 1939 and died in obscurity during World War II, but major holdings of his prolific imagery exist in many collections with the bulk of his archival materials surviving in the Gernsheim Collection at The University of Texas at Austin, the Fine Arts Library of the University of New Mexico, and the National Museum of Photography, Film and Television in Bradford.

See also: Eastman, George; and Kodak.

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MARVILLE, CHARLES (1816–c. 1879)
French photographer and illustrator

Marville was born in Paris and worked there all his life, but little is known about his biography. He had aspirations to a career as a painter, but seems to have had minimal access to academic training. By 1835 he was designing wood engravings, contributing a number of minor illustrations to Léon Curmer's illustrated edition of *Paul et Virginie*. He continued producing wood engraving designs and lithographs through the 1840s, providing illustrations for numerous publications, including Charles Nodier's *La Seine et ses bords* (1836), and Pierre Boitard's guide *Le Jardin des plantes* (1842). Marville also designed the panoramic view of Paris which graced the masthead of *L'Illustration* (1843). In July 1848 he received his only documented painting commission, a copy of Le Sueur's *La Mort de Saint Bruno*, for a provincial church. Around 1850 Marville started to make photographs.

Where and with whom Marville learned photography is unknown, but by the end of 1851 he had begun producing negatives for Louis-Desiré Blanquart-Evrard's manufactury in Lille. Many of these fell into the genres of landscape and monument views with which Marville was familiar, and an equal number were reproductions of works of art, work he had undertaken to a lesser degree in lithography. Marville contributed more negatives to Blanquart-Evrard's publications than any other photographer—at least one hundred, spread throughout most of the firm's albums, including all the views for the 1853 travel album *Les Bords du Rhin*. Around the same time he secured a position as photographer at the Louvre, where he photographed diverse works of art and the interiors of renovated galleries, such as the "Salle des Caryatides" published by Blanquart-Evrard. A vague pattern of working methods emerges here: Marville seems to have held some sort of contractual relationship with Blanquart-Evrard, the Louvre, and perhaps others, and he retained at least some negatives to use at his discretion. The nature of his work is further hinted at in an 1851 letter to the Ministry of Public Works, wherein Marville identifies himself as *Artiste-Peintre* and member of the Société héliographique (the only evidence of his membership in the society), and seeks access to state-owned historical monuments to make exterior and interior views, as well as photographs of objects housed in the buildings, for "an important photographic publication in preparation"—presumably one of Blanquart-Evrard's albums.

As early as his engagement with Blanquart-Evrard, Marville probably intended to earn a living by his photography. Like many photographers of the moment, he contributed inventions to facilitate photographic work: a negative chassis designed for travelling in 1851, and a method for transporting collodion negatives from glass to paper in 1857. But Marville never joined the Société française de photographie, which was slanted towards the rarified world of amateurs, and he would not share the secrets of his negative transport method with that group. On the other hand, he managed to secure an assignment to photograph collections of old master drawings in Milan and Turin for the Louvre; he also forged a relationship with the painter Ingres, who commissioned Marville to make photographic records of many of his drawings. All three of those drawing collections earned the photographer money for the rest of his career.

In 1856 *La Lumière* reported Marville's use of the wet collodion process to record the arrival of the Imperial Family at Notre Dame, for the baptism of the Prince Imperial. By 1858 Marville's shift to collodion was complete, as was his turn to contemporary Paris for photographic subjects. That year he was hired by some branch of Haussmann's administration to document the newly refurbished Bois de Boulogne, a jewel of Napoleon III's modernizing plans for Paris, and an important piece of propaganda at home and abroad. The album he produced (exhibited at the 1862 International Exposition

Marville, Charles. Rue de Constantine, Paris. *The Metropolitan Museum of Art, Purchase, The Horace W. Goldsmith Foundation Gift, 1986 (1986.1141) Image © The Metropolitan Museum of Art.*

in London) is a mélange of wooded landscapes similar to photographs made by Marville and others at places like Fontainebleau Forest, other views of a coiffed yet immature landscape, and records of the new built elements in the park. Marville's confrontation with this strange, modern space seems to have pushed his thinking about photography: wooded landscapes recede from his work, and urban topography becomes a central subject for the next twenty years. Moreover, his adeptness at organizing many details within the picture frame—evident in his calotypes (see for instance his series of the Ecole des Beaux-Arts and his Louvre interiors)—was broadened as he modified old landscape conventions which applied neither to photography nor to the new green spaces of Haussmann's Paris.

The change in Marville's subject matter certainly owed most to his continuing relationship with the city administration. The *Service des Promenades et Plantations* (which emerged from the Bois de Boulogne project) employed him to document the urban furniture of the new boulevards as well as the parks and squares which proliferated around the city. Around 1865 Marville received another commission, from the newly formed *Service des Travaux historiques*: a series of more than four hundred views of streets slated for demolition. In these repetitive views Marville's approach to photography, and to modern Paris, is remarkably expressed. Buildings frame and structure every view, producing stable—though not precisely symmetrical—compositions; vantage points are calculated to maximize length of perspective and the number of elements in the frame; views are often taken at a crossroads. Time and again the result is deep perspective, a multiplicity of options for the roaming eye, and a maximum of information. In 1877, the *Service des Travaux historiques* again approached Marville, for a series of one hundred views recording the wide boulevards which replaced the earlier streets. These, along with many of his records of street furniture, were exhibited at the 1878 Exposition Universelle in Paris. Throughout these years Marville continued to take a variety of freelance assignments, most often working with architects and builders to record their projects. He also retained the negatives from all his work for the city.

Marville seems to have remained aloof from the journals and societies which comprised the Parisian photography scene, and he received little notice in his lifetime. When he is mentioned, the high quality of his work is emphasized. Notably, Nadar refers to Marville's "remarkable" collections in the city archives. Reception of Marville was also muted in the twentieth century, in part because his long professional career and low profile did not accommodate critical preoccupations with calotype photography and *amateur* aims. However, given Marville's position as a predecessor to Eugène Atget, who presumably knew the earlier photographer's work well, and perhaps modelled his own quite different project on it, Marville's continued relative obscurity in photographic literature is surprising. For instance, the many researchers who might have embraced Marville's urban records in the

1930s—including Berenice Abbott, Giséle Freund, and Walter Benjamin—apparently overlooked him.

Many of Marville's photographs still reside in the archives for which they were made. Comprehensive holdings of his urban documentation are at the Bibliothèque historique de la Ville de Paris, the Musée Carnavalet, and the Bibliothèque administrative de la Ville de Paris. The Bibliothèque historique also possess 837 of Marville's glass negatives. The Musée des Monuments français holds a number of photographs from Marville's various projects, which were acquired from the photographer by the Commission des Monuments historiques. The Bibliothéque nationale in Paris has an extensive collection of Marville's calotype work, and the Bibliothèque municipale de Lille holds a concentration of his calotypes produced for Blanquart-Evrard.

PETER BARBERIE

Biography

Charles Marville was born in Paris in 1816. By the age of nineteen he had begun a career designing wood engravings and lithographs for books and illustrated journals. All we know of his artistic training is that at some point in the 1830s he frequented the Académie Suisse, a place where paying attendees (Courbet among them) could draw from a live model. In 1848 Marville received a commission from the state to paint of copy Le Brun's *La mort de Saint Bruno* for the Church of Saint Nicholas de Neufchâteau, in the Vosges. There is no other evidence of his career as a painter, and no known paintings by him survive. By 1851 he was practicing photography, making many images both for the Louvre and for the photographic publishing establishment begun in Lille by Louis-Desiré Blanquart-Evrard. From that point his freelance work expanded, and he seems to have enjoyed a lucrative career making art reproductions, public works records for various city agencies, and architectural photographs for architects and builders. Marville lived and worked at many Paris addresses during his photographic career: 14, rue du Dragon (1851–53); 27, rue Saint Dominique (1854–60); 6, rue de la Grande-Chaumière (1861); 86, rue Saint Jacques (1862–67); 75, rue d'Enfer (later 111 and then 75, rue d'Enfert-Rocherau) (1867–79). He exhibited at the Société française de Photographie in 1857, 1864 and 1865; his work was shown at the International expositions in London in 1862, Paris in 1867 and 1878, and Vienna in 1873. The record of Marville's death remains to be found; on September 20, 1879, one Armand Guérinet acquired his business and negatives, eventually selling the latter to the Service des Travaux historiques.

See also: Société française de photographie; Blanquart-Evrard, Louis-Désiré; and Société héliographique.

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MASURY, SAMUEL (c. 1820–1874)

Samuel Masury was a prominent American daguerreian artist who learned the process from the renowned John Plumbe Jr., with whom he was associated for many years. One of Masury's most notable images is a portrait of Edgar Allen Poe taken in November 1848, less than a year before the writer's mysterious death at age forty.

Born in Salem, Massachusetts, around 1820, Masury was educated in the public schools of Boston. He became a carriage maker, but took a deep interest daguerreotypes upon their introduction in 1839. In 1842, he became affiliated with Plumbe, and in 1843 he established his daguerreotype gallery in Salem, operating as Masury and Company.

Masury also operated a gallery in Providence, Rhode Island, and operated it from 1845 to 1852. In 1851 or 1852, Masury was seriously injured while experimenting with oxyhydrogen. A fire ignited a large bag of oxygen gas, causing an explosion while Masury was standing on the bag.

Although he never fully recovered from his injuries, Masury moved to Boston and resumed resumed making daguerreotypes, and later collodion negatives. He operated galleries on Washington Street from 1852 to 1867. He also began producing images for *Ballou's Pictorial Drawing Room Companion* journal, where his photographs were reproduced as woodcut engravings.

BOB ZELLER

MATSUSABURO, YOKOYAMA; See YOKOYAMA MATSUSABURO

MATTHIES-MASUREN, FRITZ (1873–1938)

German photographer, collector, and publisher

Fritz Matthies-Masuren, born in Insterburg, East Prussia on February 12, 187, was the son of the Superintendent of construction Otto Friedrich Albert Matthies and his wife Ida Johanna, and an important proponant and theorist of pictorialism in Germany. He studied painting at the Academy of Fine Arts for two years in Karlsruhe but developed a particular interest in lithography and the graphic arts. Between 1894 and 1902 he was active as a photographer (mostly of portraits and landscapes). Matthies-Masuren became an editor of and contributor to photographic journals like *Photographisches Centralblatt* [*Photographic Central Periodical*], *Photographische Rundschau* [*Photographic Review*] and *Das Atelier des Photographen* [*Photograph's Studio*], where he supported the new ideas of pictorialism. He published on the theory of pictorial photography and curated large exhibitions which travelled through Austria and Germany around 1900. Although he continued to take part in the developments of photography until the 1920s, from 1910 he became less and less active in writing. Matthies-Masuren resigned from his editorial work in 1938 and died on 10 September that year in Berlin. His collection of pictorial photographs was bequeathed to the Museum of Arts and Crafts library in Berlin, now the *Kunstbibliothek* Berlin, in 1914.

Stefanie Klamm

MAULL & CO. (MAULL & FOX, MAULL & POLYBLANK)

Henry Maull and his successive partnerships form one of the most outstanding examples of Victorian photographic portrait work, and their publication of the photographs of celebrities of the day, starting in 1856, was the first of its kind in the world. It was rapidly imitated allover Europe during the succeeding decades, as was the use of a brief biographical essay to accompany each portrait.

The senior partner, Henry Maull (1829–1914) began his career as an artist and printer in Bloomsbury, close to his birthplace in Clerkenwell In 1854 he went into partnership with George Henry Polyblank (1828–?) in a studio at 55 Gracechurch Street, in the City of London and two years later, in May 1856, began the issue of "Photographic portraits of living celebrities issued on a monthly basis, with biographical notes for the first four by Herbert Fry, thereafter by Edward Walford. The first number featured Richard Owen; the entire sequence ran as follows: 1) May 1856, Richard Owen; 2) June 1856, Thomas Macaulay; 3) July 1856, Robert Stephenson; 4) August 1856, John Roebuck; 5) September 1856, Sir Benjamin Brodie; 6) October 1856, Edward Hodges Bailey; 7) November 1856, Samuel Warren; 8) December 1856, Professor Thomas Graham; 9) January 1857, Edward Matthew Ward; 10) February 1857, Lord Campbell; 11) March 1857, George Cruikshank; 12) April 1857, Rowland Hill; 13) May 1857, Sir William Fenwick Williams; 14) June 1857, William Frith; 15) July 1857, Cardinal Wiseman; 16) August 1857 Lord Brougham; 17) September 1857, Martin Farquhar Tupper; 18) October 1857, Michael Faraday; 19) November 1857, John Gibson; 20) December 1857, Earl of Rosse; 21) January 1858, Charles Kean; 22) February 1858, William Gladstone; 23) March 1858, Sir Archibald Alison; 24) April 1858, William Stemdale Bennett; 25) May 1858, David Uvingstone; 26) June 1858, Earl of Aberdeen; 27) July 1858, Daniel Maclise; 28) August 1858, Lord Stanley; 29) September 1858, Dr. Tait, Bishop of London; 30) October 1858, Austen Layard; 31) November 1858, Clarkson Stanfield; 32) December 1858, Lord Panmure; 33) January 1859, John Buckstone; 34) February 1859, Comte de Montalembert; 35) March 1859, Samuel Lover; 36) April 1859, Lord John Manners; 37) May 1858, Bishop Samuel Wilberforce; 38) June 1859, Sir John Lawrence; 39) July 1859, Lord Colchester; 40) August 1859, Archbishop of Canterbury. In October 1859, the complete set was issued in book form, distributed by William Kent & Co.

The series was an overwhelming success. *The Literary Gazette* (October 18, 1856) commented 'We acknowledge with unmixed satisfaction the excellence of the portraits. They are as successful specimens of the art as any that have yet appeared, both as to the pose of the figures, and in sharpness and delicacy of detail. They have also the advantage of being simply printed from the negatives, and entirely free from any after touches." Their success was matched by a parallel series of portraits collectively known as "Literary and Scientific Portrait Club," it was issued 1855–c 1858, without text. Among those included were the cream of the Victorian scientific world—Darwin, Playfair, Lanchester, Lyell, Murchison, Bowerbank, De La Rue, Gosse, etc. Several incomplete sets exist—one of 54 portraits, at the National Portrait Gallery, another series of 95 at the Linnean Society. The club itself "was instituted for the purpose of attaining a uniform set of portraits of the literary and scientific men of the present age at a moderate cost." The terms of admission to the club being that each member having a photograph of himself taken by the artists of the club, Messrs Maull and Polyblank, at the cost of 10s. 6d'.

The success of these series enabled Maull and Polybank to open a second studio at 187a Piccadilly, Westminster in May 1857, and a third, at 252 Fulham Road, Chelsea, in 1864, specialising in equestrian portraits. A private album of similar portraits was issued in 1856,

with eleven portraits, under the title "On the introduction and progress of the screw propeller" notably featuring Francis Pettit Smith and Charles Manley.

The partnership was dissolved March 8, 1865, and Maull continued the firm as Maull & Co., closing the City studio and opening a new one at 62 Cheapside. Polyblank filed for bankruptcy November 2, 1867, and was eventually discharged in the following January. A persistent rumor in the Polyblank family suggests that he emigrated to the United States in the late 1860s, but no further trace of him has been recorded, and the end of his career is unknown.

In 1877, Henry Maull reconstituted the firm, and took as his partner his former manager, John Fox (1832–1907). As Maull & Fox, the firm soon closed the surviving City studio, and concentrated their photographic work at 187a Piccadilly, a second-floor studio situated above the well- nown bookshop, Hatchards. The partnership was dissolved after only eight years, on May 21 1885, but Fox's son, Herbert Fox (1870–) continued the firm, assisted by Frederick Glover after Maull's retirement to Ramsgate in 1890. He died in Brighton June 26, 1914, a year after Maull & Fox became a limited company in order to acquire the Piccadilly business. In 1924 the West End studio was moved to 200 Gray's Inn Road; it was wound up October 26, 1928, and the copyright and negatives acquired by the Graphic Photo Union, eventually absorbed into Kemsley Newspapers, publishers of the *Sunday Times*, in 1952.

Like many other Victorian photographic studios, Maull found the transition to the twentieth century a leap too far. In addition, their substantial contracts with the illustrated weeklies to supply a constant stream of portraits for reproduction as wood engravings, began to decline dramatically with the introduction of photogravure and the rise of specialist firms. The firm's very static poses, with an occasional prop, had gone irretrievably out of fashion by the end of the nineteenth century .

Henry Maull's elder brother, George Maull (1820–1885) operated two photographic studios in the Lewisham area of South London in the 1860s and 1870s, but is not known to have participated in the West End studios. A good selection of work by Maull's various partnerships is held by the National Portrait Gallery, with smaller collections at the Victoria & Albert Museum & Hulton Getty.

DAVID WEBB

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MAWSON & CO. (ESTABLISHED 1828)

The company originated as Mawson and Company in 1828 when John Mawson (1815–1867) began trading in Newcastle-upon-Tyne, England, specialising in pharmaceutical products. Mawson followed the photographic discoveries of the times and once the new discipline was established, he began to produce the necessary chemicals. By 1848, he had engaged Joseph Wilson Swan (1828–1914) as his assistant, but made him a junior partner in 1865, by forming Mawson & Swan. Within two years, however, Mawson was killed in a nitro-glycerine explosion whilst officiating as Mayor of Newcastle and Swan took control. Mawson's widow was Swan's sister and Elizabeth now joined the company to supervise publishing and bookselling, and when the company eventually relinquished its interest in photographic materials, it continued to trade as Mawson, Swan and Morgan, into the middle of the twentieth century.

Swan had previously worked for six years as an apprentice to a local firm of druggists and joined with knowledge of chemistry and the evolving photographic processes. It was natural for the two men to explore aspects of emulsion making, and Mawson introduced his partner to local contacts and then constructed a small workshop for him above the pharmacy, at 39 Moseley Street, Newcastle. By 1854, Swan had perfected the production of collodion, and the company entered the growing photographic market by launching Mawson's Collodion. For forty years, the product maintained its reputation, as many testimonials confirm—"the first of its kind, the best as well, and doubtless the most largely used and widely sold of all collodions in existence."

Another success came in February 1864, when Swan patented the carbon printing process, which provided distinctive photographic prints, free from deterioration. The company marketed carbon prints, as well as the materials for making them, and offered the process under licence to third parties, such as The Autotype Company, which later purchased the rights. (In 1885, Swan also negotiated a business partnership with Thomas Annan, Glasgow.) Swan's expertise in working with electricity led to the invention of a carbon filament light bulb (1879) and variants of the invention were adapted for photographic applications, such as standardising studio lighting and controlling variable for exposing carbon prints and bromide prints.

Swan's success with the carbon process had capitalised on the company's prowess in combining a suitable gelatine for making the print, and a powerful lamp for making the exposure. With a general manager

replacing Mawson, the company continued to innovate and in 1871, addressed the growing market for silver emulsions, in liquid form, and later as dry plates. During preparation, Mawson & Swan utilised a heating stage to improve sensitivity. Production, however, was hampered by the need to coat dry plates by hand, a procedure George Eastman later dismissed as "tedious and slow."

To augment its negative materials, the company achieved a singular success in 1879, when Swan devised and patented the gelatino-bromide paper process based on silver bromide. Improved machinery was installed to ensure uniformity of coating of the paper base, which was "adapted to the production of bold and vigorous prints." Because of its sensitivity, it was "specially useful for enlargements and the matt surface made it "scarcely distinguishable from the finest Platinotypes."

At the time, Europe was considered to be the centre of photographic expertise, and English companies successfully traded in America. A young American entrepreneur, George Eastman, was impressed that the high prices were not affected by the lively competition. He had invented a machine which would replace hand-coating and once he received patent-protection in London, he intended to persuade the important manufacturers to purchase it.

He sailed to Liverpool in 1879, and received introductions to some English companies, including Mawson & Swan, but only made a few unsatisfactory sales. Eastman returned to America, and two years later, relinquished his position at Rochester Savings Bank so as to concentrate on the manufacture of dry plates at his own small factory. Soon he received complaints about product quality and he was forced to shut down production. Lacking a solution, he returned to England in March 1882 and appealed to Mawson & Swan. He was permitted to "stand in the works" for two weeks, during which time Eastman realized that his supplier of gelatine had changed its specification. He immediately struck a deal with his hosts whereby Eastman agreed to exchange manufacturing secrets for Mawson & Swan's emulsion-making knowledge.

Mawson and Swan published a catalogue covering chemicals, scientific apparatus, microscopes, electrical, magnetic and physical apparatus, and part four was "a singularly comprehensive work, enumerating everything in the way of photographic apparatus and materials, and containing prices and graphic illustrations of all articles used by the amateur or professional photographer." In addition, the company issued helpful booklets, such as, *The Wet Collodion Process, How to Make Transparencies, Photography Simplified*, and *Gelatino-Bromide Paper Process, Contact Printing and How to Make Enlargements*, to promote its papers. To encourage the use of its premium plates, the company regularly awarded silver medals for areas of specialisation, such as "instantaneous marine photography."

In 1892, the company adopted Hurter and Driffield's procedures for plate testing, and with justification claimed its "Mawson" was "the quickest plate" on the market, but recommended its Castle Plate "for all ordinary purposes." In a private note to Vero Charles Driffield, however, J. Smith Green, Mawson & Swan works manager, complained that "those who use Oxalate Iron for development are quite exceptional …." Improvements continued, and in 1896 Mawson & Swan was producing "extra rapid" plates for studio work, and special plates for the emerging "instantaneous" market (i.e., the use of hand-held cameras.) A representative's report stated: "Electric plates are taking on splendidly; the professional photographers appreciate them this dull weather, and everyone who has tried them is delighted with them."

Although much altered from the pharmaceutical company established early in the nineteenth century by John Mawson in a shop in Mosley Street, Newcastle, and which had evolved as the Head Office, Mawson & Swan had also established works in Newcastle and Gateshead, a dry plate factory at Low Fell, (on the south side of Gateshead), and offices and warehouses in Soho Square, London, to handle distribution throughout Europe and America. Despite the staff pension fund terminating in 1973, Newcastle recognised the company on October 12, 1978, by hosting an exhibition of its achievements.

RON CALLENDER

See also: Swan, Sir Joseph Wilson; Carbon Print; Emulsions; and Eastman, George.

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MAXWELL, JAMES CLERK (1831–1879)

English physicist and inventor

Three photographic plates of a tartan ribbon, taken in 1861 by Thomas Sutton through red, green, and blue filters, were used by James Clerk Maxwell to demonstrate that photography in colour could be a practical proposition. Positive lantern slides made from those plates, each projected back through the taking filter,

could be reassembled on the screen to recreate the full colour of the original ribbons.

Maxwell was born in Edinburgh on June 13, 1831, and the family moved to Kirkcudbrightshire in 1834. He was educated at home for some years, but later studied at Edinburgh Academy and Edinburgh University before periods at Peterhouse and Trinity Colleges in Cambridge.

His first academic appointment was at Marischal College in Aberdeen, but four years later he was appointed Professor of Natural Philosophy at King's College, London. Already recognised as one of the eminent physicists of his day, he quickly developed a reputation as a leading authority and thinker on electro-magnetism, and was the first to offer the proposition that light was a form of electro-magnetism. He also conducted early research into colour blindness.

By 1871 he was the first Cavendish Professor of Physics in Cambridge, and a major force behind the design and establishment of the world-famous Cavendish Laboratory.

He died on November 5, 1879, at the age of only 48.

JOHN HANNAVY

MAYALL, JOHN JABEZ EDWIN (1813–1901)

John Jabez Edwin Mayall was one of the most enduringly successful professional photographers in nineteenth-century Britain. Born in Oldham in 1813, Mayall's photographic career began when he moved to Philadelphia in late 1841 or early 1842, working there at 140 Chestnut Street as a photographer until 1846. While working in Philadelphia between 1843 and 1844, Mayall made an important series of ten daguerreotypes depicting scenes from The Lord's Prayer. This illustrative use of photography was highly innovative and prefigures later work by Oscar Rejlander and Julia Margaret Cameron. In 1848, Mayall's brochure for his London studio claimed that "These are the first efforts in developing the new branch of *photographic fine art*. . .Female figures (some of the most beautiful and talented ladies of Philadelphia) have been chosen to embody the precepts of this Divine Prayer." Subsequent narrative pictures included studies of *Macbeth*, *Hamlet* and Thomas Campbell's poem "The Soldier's Dream." Many of these tableaux were shown at the Great Exhibition in 1851, where the catalogue called them "Daguerreotype pictures to illustrate poetry and sentiment."

In June 1846, Mayall returned to London. For a short while, he served as an assistant to Antoine Claudet, before setting up his own studio at 433 Strand. Mayall initially operated under the name of Professor Highschool at the "American Daguerreotype Institution." American daguerreotypes were known for their exceptional clarity and Mayall was numbered among the first rank of photographers. In April 1847, the Athenaeum reviewed the work of Kilburn and Mayall and declared that the pair were "both so fertile in resource and imagination, that in their hands it will probably be proved that this art is as yet only in its infancy." One notable feature of Mayall's work at this stage was his repudiation of the practice of colouring daguerreotypes; he was worried that a reaction with the photographic chemicals would harm the permanency of the image.

Mayall, John Jabez Edwin. The Prince of Wales (Edward VII). *The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.*

According to Baden Pritchard, Mayall's great coup came in 1851 when he was asked to take pictures of the Great Exhibition. He subsequently became friends with Prince Albert and, in 1855, was invited to photograph the British royal family. In 1855, the military authorities also turned to him for advice. Two soldiers, Ensign Brandon and Ensign Dawson, were trained by Mayall for a month so they could operate as photographers in the Crimea. His improving commercial fortunes are also reflected in his opening another establishment at 224 Regent Street in 1853, which was expanded to 226 Regent Street in 1856.

Mayall was responsible for several technical developments: throughout his career he was concerned with improving the potential of the medium. On 25 January 1853, he took out a patent for the production of imitation

crayon drawings. As early as October 1850, Mayall had written to the *Athenaeum* detailing his process, and had exhibited examples at the Great Exhibition. His invention interposed a slowly revolving disc between the camera and the object being pictured. The disc, arranged on a support, had a star-shaped hole in its centre. The revolving star design made the resultant photograph similar to a vignette portrait. In 14 October 1855, Mayall also took out a patent for the making of artificial ivory to receive photographic pictures. Another area of expertise was in the enlargement of photographs. He claimed credit for being the first photographer to successfully use the collodion process to enlarge and copy daguerreotypes.

After the Photographic Society of London was founded in 1853, Mayall took an active interest in its proceedings, attending meetings and giving several papers. He was also a member of the committee set up to organise a testimonial fund for the widow of Frederick Scott Archer. His perceived debt to Archer is evident in that that, of the £747 raised, he was the largest contributor.

When photography became a commercial medium, Mayall was one of the principal beneficiaries. Unlike many of the gentlemen amateurs who dominated photography in the mid 1850s, Mayall enthusiastically embraced the rage for celebrity portrait *carte-de-visites*. In 1858, he took part in a venture with D.J. Pound, the publisher of the *Illustrated News of the World*. Together they published a series of engravings of eminent personages that were based on photographs by Mayall. Along with Maul and Polyblank's *Photographs of Living Celebrities* (1856–58), the venture represents one of the earliest attempts to exploit the value of celebrity photographs.

Mayall's commercial prosperity was secured when, in May 1860, he was again invited to Buckingham Palace to photograph the royal family. Mayall's *Royal Album* was published in August 1860 and was a phenomenal success. Consisting of fourteen *carte-de-visites* of Victoria, Albert and their children, it was the ever first set of royal photographs that were widely available. The *Athenaeum* claimed that each portrait reproduced "with a homely truth, far more precious to the historian than any effort of a flattering court painting, the lineaments of the royal race." In March 1869, the British Journal of Photography reported that Mayall had been paid £35,000 by Marion & Co. for his royal pictures. He went on to publish several sets of royal photographs, including the wedding photographs of the Prince and Princess of Wales in March 1863.

Mayall's royal patronage led to numerous commissions from distinguished personages such as Gladstone, Lord Derby, and Lord Brougham:

> Imitating this high example, distinguished persons of rank and pursuit availed themselves of the photographer's services, and left him with a negative impression of themselves, from which thousands could be printed. (M.A. Root, *Camera and Pencil,* Philadelphia: J.P Linnicot, 1864: 381)

Prior to the introduction of the Copyright Bill in July 1862, one innovative feature of Mayall's celebrity *cartes-de-visite* is his attempt to counter the numerous quasi-illegal reproductions. In the early 1860s, many of his pictures are inscribed with his initials and the date of their exposure. This inscription was intended to act as the equivalent of an official trademark, which it would be illegal to copy.

Several London establishments were managed under Mayall's name from the 1860s to the 1890s, as he himself moved to the genteel environs of Brighton in 1864. His studio at 433 Strand later was complemented by others at 224 Regent Street West 1853–94; 224 and 226 Regent Street (1857–67); 15 Argyll Place, West (1859–67); 164 New Bond Street West(1881–1886); 90-91 King's Road, Brighton (1864–1904). Mayall & Co. operated at 164 New Bond Street (1887–92); 73 Piccadilly West (1893–96); 126 Piccadilly West (1897–1908). In Brighton he continued his work as a photographer through a studio in King's Road and his career is remarkable for its sheer longevity. He was a Photographic Society Council member in 1875 and, in 1880, his Bond Street studio was one of the first London establishments to use electric light. In Brighton, Mayall also became involved with local politics. He was elected as a councillor in 1871, an Alderman in 1874, and was Mayor between 1877 and 1878. Other late honours include being elected a fellow of the Royal Institution in 1864 and of the Chemical Society in May 1871.

Mayall died on 6 March 1901, bringing to an end a remarkable photographic career that spanned sixty years.

JOHN PLUNKETT

Biography

John Mayall was born in Oldham in Lancashire in 1813. His father, John Meal, was a manufacturing chemist in West Yorkshire. Mayall, who was born Jabez Meal, married Eliza Parkin in 1834, with whom he had three sons and one daughter. He left Britain for Philadelphia in late 1841 or early 1842, returning to London in 1846 and resumed his professional career. His first studio was at 433 Strand (1847–55). Many of the later studios were managed under Mayall's name as he himself moved to Brighton in 1864. Mayall was one of the foremost daguerreotypists during the late 1840s and maintained his reputation when he moved to collodion process dur-

ing the 1850s. Best known for his pictures of the Great Exhibition and the British royal family, it was the advent of the celebrity *carte-de-visite* that secured his commercial fortune. Other publications include *The Illustrated News of the World and National Portrait Gallery of Eminent Personages* (1858–63), *Royal Album* (1860), and *Mayall*'s *Celebrities of the London Stage; A series of photographic portraits in character* (1867–68). After being widowed, Mayall married for a second time in 1871, and had two daughters and one daughter by Celia Victoria Hooper. A prominent member of the Brighton community in later life, he died on 6 March 1901.

See also: Rejlander, Oscar Gustav; Cameron, Julia Margaret; Claudet, Antoine-François-Jean; Athenaeum**;** Victoria, Queen and Albert, Prince Consort; Photographic Exchange Club and Photographic Society Club, London; Archer, Frederick Scott; Carte-de-Visites; British Journal of Photography; and Marion & Co.

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MAYER AND PIERSON COMPANY

The fashionable Parisian commercial photography firm of Mayer and Pierson, consisting of Ernest Mayer, his brother Frédéric and Pierre Louis Pierson, was first established as Mayer Frères in the early 1850s as a purveyor of photographic supplies and studio portraits. Pierson, a daguerreotypist, joined the firm by 1854 and the company operated out of lavish studios on the Boulevard des Capucines serving such powerful Second Empire figures as Napoleon III and his one-time mistress the Countess de Castiglione (Virginia Oldoini), actress Rachel and composer Rossini. The firm, together with the many others that populated Paris during this period, was nurtured by the modernizing principles of Napoleon III which promoted photography as both a symbol of modern France and a desirable luxury good. Specializing in studio portraits, celebrity c*artes-de-visite* and the use of such novel processes and techniques as the ambrotype, Mayer and Pierson reached the pinnacle of its success in the late 1850s and early 1860s through a fruitful combination of artistry, technology and sound business practice; by 1862, however, Ernest Mayer had sold his share of the company to Pierson, who had taken over the business. In 1874 Mayer and Pierson was sold to Pierson's son-in-law Gaston Braun and was incorporated in 1876 under his father, the photographer Adolphe Braun. Pierson remained manager of the company until 1909. The Mayer and Pierson archive of glass plate negatives is housed by the Musée d'Unterlinden in Colmar and photographs representing the firm can be found in the collections of the Metropolitan Museum of Art, the J. Paul Getty Museum and many private collections.

The reputation of Mayer and Pierson rose above that of many other Second Empire commercial firms because of its illustrious clientele and high profile commissions, proficient use of hand-coloring to enhance its products, state of the art studios, effective use of advertising, prominent displays of photographs at World's Fairs, satellite studios in London and Brussels, publication of *La Photographie considérée comme art et industrie* in 1862, and successful lawsuit to change copyright laws during the same year. Napoleon III is believed to have first visited the Mayer Frères studio in 1853 and continued his family's relationship with the company until at least 1860. In 1856, the Emperor selected the firm to be the official photographers of the world leaders gathered for his triumph of diplomacy, the Paris Peace Congress. The following year Napoleon III whimsically appeared with the Empress Eugénie, their son and his pony for a portraiture session at the studio. The company, however, had its detractors, including their competitor Nadar, who denigrated the photographers as portraitists, claiming that "they restricted themselves, very profitably, to one style . . . of picture. . . . Without a thought for composing the picture in a manner favorable to the sitter" (*The Second Empire*, 1978, 421).

The Emperor, though, seemed not to notice this and encouraged members of his court to patronize Mayer and Pierson, among them his Italian mistress the Countess de Castiglione, with whom he had an affair between 1856 and 1857. The Countess worked with Pierson frequently between 1856 and 1867 and then only sporadically until her death in 1899. She is perhaps the company's most infamous, inventive, and intriguing patron, one who took

full advantage of the company's prestige and prowess to further her reputation as a femme fatale and developed a collaborative artistic relationship with Louis Pierson, who photographed her as herself as well as in the guise of the Queen of Hearts, the Hermit of Passy, and the Queen of Etruria among other fictional and historical characters who appealed to the Countess's sense of drama and often served a narrative purpose in her life. For example, after an argument with her estranged husband, the Countess sent him a Pierson photograph of herself masquerading as "Vengeance," carrying a dagger in her hand.

Many of Pierson's photographs of the Countess were hand painted, a specialty that the company first began to widely advertise with an exhibition at the 1855 Exposition Universelle in Paris and continued to capitalize on with a successful showing of photographs of the Countess at the 1867 Exposition Universelle, also held in Paris. In addition, the Countess took full advantage of the studio technology employed by Mayer and Pierson, including illusionistic backdrops that slid back and forth on rails, lighting controlled by mobile screens activated by springs and a plethora of architectural and decorative props.

Mayer and Pierson's success with the mass production of celebrity cartes-de-visite in the late 1850s and early 1860s, aided by the use of a special camera that allowed eight separate portraits to be taken on one negative, led to a highly publicized lawsuit against commercial photographers Thiebault, Betbéder and Schwabbé in 1862 that in the end won protection for photographs under French copyright laws by legally defining photography as an art form. In two separate instances, Mayer and Pierson cartes-de-visite had been copied and sold under the name of a different commercial company: Thiebault and Betbéder retouched a Mayer and Pierson photograph of the Italian minister Cavour and marketed it as their own and Schwabbé countertyped a carte-de-visite of Lord Palmerston and sold it as his own work. Until Mayer and Pierson filed their lawsuit, photographs were not protected under copyright law because they were not defined as a fine art like painting was. Thus when Mayer and Pierson won their lawsuit on appeal, they also claimed a victory for the definition of photography as a fine art rather than a product of science of technology.

KIMBERLY RHODES

See also: Cartes-de-Visite; Braun, Adolphe; and Nadar (Gaspard-Félix Tournachon).

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MAYLAND, WILLIAM (1821–1907)

English photographer

Born in Blackheath, Lewisham, November 21, 1821, Mayland started his photographic career in Cambridge in the 1860s. In 1869 he moved to London to join Thomas Richard Williams (1824–1871) at his studio 236 Regent Street, Westminster, and on the latter's death took sole control, although the studio name was not formally changed to Williams & Mayland until 1880.

Mayland was one of the leading lights of the pioneer photographic society, the Solar Club (1865–69), succeeding Henry Peach Robinson as Chancellor, and passing on the office to William England. In Cambridge, he photographed the construction of Sandringham House, by special commission from Queen Victoria. The scale of his *carte-de-visite* work in London enabled him to survive bankruptcy in 1878. The studio featured in H. Baden Pritchard's 1882 book *The Photographic Studies of Europe*.

Mayland was an accomplished reciter and occasional private actor, often in Shakespearian productions with his wife Mary (1832–79), a niece of Sarah Siddons. Ill health forced Mayland to close his studio in May 1882, and he retired to Tunbridge Wells, although he died in Islington on October 31, 1907. His collection of negatives was acquired by Samuel Walker.

DAVID WEBB

MAYNARD, RICHARD (1832–1907) AND HANNAH (1834–1918)

Canadian photographer

Richard Maynard was born on February 22, 1832, in Stratton, Cornwall, England, and his wife was born as Hannah (or Anna) Hatherly on January 17, 1834, in Bude, Cornwall. Married in 1852, they immigrated to Canada and lived in Bowmanville, Ontario, for a decade. They resettled in Victoria, British Columbia, where she opened a photographic studio and Richard worked as a cordwainer (shoemaker). Hannah, who likely learned photography in Bowmanville from R. & H. O'Hara, taught him the

craft. Richard's photographic work between 1873 and 1892 consisted almost entirely of single-lens and stereo landscape views, chiefly along the British Columbia and Alaska coastlines, as well as construction of the Canadian Pacific Railway between 1880 and 1886. Hannah confined herself almost exclusively to studio portraiture, starting with unsophisticated carte-de-visite poses and progressing to elaborate studio backdrops and props for group portraits by the 1890s. Recognized as an artistic genius for her multiple exposure or trick photography, she was likely aided in this work by Arthur S. Rappertie (1854?–1923), her studio assistant for over 30 years. The British Columbia Archives preserves their negatives and personal papers. Buried in Ross Bay Cemetery, Victoria, the Maynards' photographic work continues to be widely reproduced and analyzed.

DAVID MATTISON

MCCOSH, JOHN (1816–1894)

British photographer, doctor, writer, and poet

The life of military surgeon Dr. John McCosh was full of incident. Present during some of the many wars of Victorian India, he took to photography as a hobby, and perhaps as a relief from the stresses of surgery under military conditions.

He was widely travelled, and survived a terrible shipwreck when the SS *Lady Munro* was lost en route to Tasmania from India in 1836. McCosh, sent on the voyage to recuperate after a serious bout of fever, went on to write about the incident in great detail. He later published his account, and during his lifetime published several volumes of writings on subjects as diverse as travel, photography, poetry, and medicine.

The early calotypes by Dr. John McCosh embrace a number of applications of photography, and at first glance defy simple classification. Their diversity is perhaps the key to understanding them. McCosh, a British military surgeon, used the medium simply to preserve images of the people and places he came into contact with, much as the majority of camera-users do today. Attributing to him the accolade of being the first war photographer—as many writers have done over the years—is to place his work within a context the photographer himself would not have recognised.

In the introduction to a surviving album of his work, we noted

> These photographs have no pretensions to merit. The negatives were taken on paper before the present process of collodion was known. Their fidelity will, however, make amends for their sorry imperfections. Like fragile remains of lost ages, their value is enhanced because the originals are no longer forthcoming.

That single album, assembled in 1859, contains over three hundred prints, the majority from calotype negatives, and thirty-one from collodion negatives. It is now in the collection of the National Army Museum, London. Contained within its pages are many portraits of friends and fellow officers, portraits of Burmese men and women, a number of views of the architecture, landscape and military installations of the places in which he served as an army doctor—Burma, Bengal, and elsewhere in India, and a single calotype image by Calvert Jones. Included are a number of images unquestionably taken while on active service in war zones, but these are far removed in subject and treatment from the photography at war—or of war—created by Roger Fenton, James Robertson, Alexander Gardner, and others.

Writing in 1856 in *Advice to Officers in India*, after he had retired from the army, McCosh wrote

> I would strongly recommend every assistant-surgeon to make himself a master of photography in all its branches, on paper, on plate glass, and on metallic plates. I have practised it for many years, and know of no extra professional pursuit that will more repay him for all the expense and trouble (and both are very considerable) than this fascinating study—especially the new process by Collodion for the stereoscope. During the course of his service in India, he may make such a faithful collection of representations of man and animals, or architecture and landscape, that would be a welcome contribution to any museum.

These remarks confirm that he had used collodion, and certainly thirty-one of the prints in the album are from collodion negatives, but the architectural views are all on paper.

While two of his early calotype self-portraits are captioned "the Artist"—two others taken on collodion are untitled—his advice to other aspiring photographers makes reference only to representation and not to any aesthetic sensibilities or intentions.

McCosh was introduced to photography some time in the 1840s. The earliest image for which a date can be conjectured is 1848, and the naivety of the images from this date suggests that these may be early examples of his photography. His interest in the medium may have been triggered some time between 1844 and 1847, when he was stationed near the Nepal border at Almra. Much of his work is small format, with images measuring no more than 10cm x 8cm, and typically limited to simply posed studies of colleagues and friends. The format of his portraits varied little whether on paper or glass, suggesting the same camera might have been used for both.

Amongst his subjects were Vans Agnew, photographed in 1848. Shortly after posing for McCosh's camera, Agnew was murdered by the local Hindu Governor, Mulráj during the 2nd Sikh War. The combination of a small camera with which to make his calotype

negatives, a large lens, and the bright light of the Indian sub-continent combined to reduce exposure times considerably. The combination of these features enabled McCosh to pose and photograph his subjects with little need to contrive positions that could be sustained for extended periods of time. Even in his early works the figures seem relaxed and natural. Several of his Burmese images show growing confidence in posing his subjects and in controlling the medium. McCosh worked outdoors often posing his subjects posed against white backgrounds. Relaxed squatting or crouching poses have been used, giving a modernity and an immediacy to the faces and figures he presents. This very direct approach belies the age of these images and the insensitivity of the process he was using.

By the time of the 2nd Burma War 1852–1853, lightweight bellows cameras—such as those designed by William [Marcus] Sparling, Major Halkett and others—were available, and by the mid 1850s when McCosh wrote his *Advice to Officers in India* they had become commonplace for military personnel and other amateurs working overseas. To McCosh, they offered no attraction whatsoever and he commented

> The camera should be made of good substantial mahogany, clamped with brass, made to stand extremes of heat. The flimsy, folding portable cameras, made light for Indian use, soon become useless.

From that it can be assumed that he remained loyal to the sliding box design, despite its weight.

Several of the images produced in 1852 and 1853 are of a larger format than those from earlier in his career, pointing to a larger—and heavier—camera. The prints from these later negatives measure up to 20cm × 22cm, suggesting a camera approaching whole plate in size, compared to the probable quarter plate size of earlier images.

Although there are no specific dates attributable to his collodion images, it is clear McCosh continued to take photographs well into the 1850s. Indeed, he appears in an 1856 photograph taken at Hampton Court by Roger Fenton to commemorate the summer outing of the three year old Photographic Society, posing in front of a horse-drawn photographic carriage similar to that used by Fenton for much of his collodion photography.

JOHN HANNAVY

Biography

John McCosh was born into a medical family in the Scottish village of Kirkmichael in Ayrshire on the 5th of March 1805. Several brothers also became doctors, and John joined the Bengal Medical Service as an assistant surgeon at the age of twenty-six. He enrolled at Edinburgh University in 1840 to take a degree in military surgery, surgery, and medical jurisprudence. His medical career was spent almost entirely in and around India, and saw service in the 2nd Sikh War (1848–1849) and the 2nd Burma War (1852–1853). It is from the period spanned by these two conflicts that his surviving photography dates. He retired from the army in 1856. In addition to his interests in medicine and photography, McCosh enjoyed writing poetry, and published several works of verse after retiring from military service. He died in London on 16th March 1885. The generally accepted spelling of his name is "McCosh although "MacCosh" and the abbreviated "M'Cosh" have also been identified. The images in the surviving album are identified as "Photographs by Jethro M'Cosh, Surgeon, Bengal Army."

See also: Calotypes and Talbotypes; War Photography; and Wet Collodion Negative.

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MCGARRIGLE, JOHN (active 1870s)

Little is known about this photographer other than the fact that he claimed to have been employed by the Mexican government prior to his arrival in Auckland, New Zealand.. During his short stay in Queen Street, he secured a wonderful series of Maori studies in the form of carte-de-visite portrait sittings. When he left New Zealand in the early 1870s, he managed to leave these in the custody of someone who later negotiated their sale to the Dunedin firm of Burton Bros. Burton's were expanding their collection of New Zealand views at the time and this collection of Maoris portraits, which they never acknowledged, served them greatly for many decades to come. With no written records to fall back upon, it is difficult to identify or assess the true wealth of McGarrigle¹s work or how these engaging portraits came into being. Tribes coming to Auckland from their ancestral lands may have been enticed into his studio for their portrait by inducements like a free set of prints if they gave permission for them to be

used as sales to colonists who wanted to send studies of Maori heads to friends overseas. The mix and match of European costuming with traditional clothing and artifacts certainly suggests a very impromptu series of studio encounters.

William Main

MCKELLEN, SAMUEL DUNSEITH (1836–1906)

S.D. McKellen was born in Ireland in 1836 and a year later the family emigrated to Manchester where Samuel was to spend most of his working life. McKellen trained as a watchmaker and jeweller and had opened his own business by 1861.

It was around this time that McKellen developed an interest in photography making his own camera from a cigar box and lens. By 1881 he had began to design the camera that would lead one obituary to describe him as 'the father of the modern camera.' The design was made up for him by the Manchester camera maker Joshua Billcliff which McKellen then field tested and extensively demonstrated. It was shown at the annual exhibition of the Photographic Society in October 1884 where it was awarded a gold medal—the first the Society had given for a camera. McKellen was elected to the Society the following month, although he let his membership lapse.

McKellen began commercial manufacture of his camera which was sold under the Treble Patent name and incorporated at least three of his four patents from the same year. By 1887 the camera incorporated eight McKellen patents. The design was based on McKellen's own experiences as a photographer and was intended to be: light in weight, rigid, easily erected and folded into a compact shape, to accept lenses of different focal lengths, simple in construction and with a swing back and front. The design allowed mass-production and McKellen's factory was was soon employing thirty-five workers and mechanised to allow this. The design was a significant development of the Kinnear camera of 1857 but incorporating the McKellens own principles. It camera was copied by volume manufacturers such as Thornton-Pickard against whom McKellen took legal action and the design, from different manufacturers, remained popular until the early 1900s.

McKellen produced a range of other photographic equipment including a Detective hand camera which he patented in 1888 and licensed to Marion and Company. This camera was significant for incorporating an internal mirror for reflecting the image on to a ground glass screen and a roller blind shutter for which he gave acknowledgment to Thomas Sutton and his design of 1861.

McKellen received twenty-eight photographic patents between 1884 and 1904 but he was not a good businessman and failed to secure his designs losing sales to competitors. He was also under capitalised. A move to establish a public company in 1899 and new products failed to provide financial security and by the time of his death he was penniless and estranged from his wife.

S.D. McKellen died on 26 December 1906 in a Manchester hospital.

Michael Pritchard

See also: Patents: Europe and the United Kingdom; and Lenses: 2. 1860s–1880s.

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MCLAUGHLIN, SAMUEL (1826–1914)

Irish photographer, inventor

Samuel McLaughlin was a watchmaker, publisher, and photographer; born Rathlin Island, County Antrim, Ireland, January 28, 1826; died Los Angeles, California, August 26, 1914. Born in Ireland of Scottish parentage, Samuel McLaughlin was living in Quebec City by the age of fifteen. He began work as a watch and chronometer maker, and then, after a brief period working with a firm of silversmiths in New York, became a book and periodical agent and publisher of city directories, 1854–57. He took up photography as an amateur, later turning professional, for a time, in partnership with Samuel McKenney and William Lockwood. McLaughlin produced Canada's first photographically illustrated serial publication *The Photographic Portfolio: A Monthly View of Canadian Scenes and Scenery* (1858–59), a series of twelve views in and around Quebec City, with accompanying letterpress text. In September 1861, he was appointed the first official "photographist" for the Canadian government and moved to Ottawa where he remained a civil servant for the next thirty years. Best known for his architectural views of the construction of the Parliament Buildings in Ottawa, McLaughlin worked as Chief Photographer for the Department of Public Works and later the Department of Railways and Canals, producing impressive documentation of many Canadian public works projects, most notably wharves, timber slides and booms, dams, and fish breeding works along the Saguenay River. He was succeeded by his son Daniel after he retired to Los Angeles, where he died.

Joan M. Schwartz

MEADE, CHARLES RICHARD (1826–1858) AND HENRY W. M. (c. 1823–1865)

Subscribers to *Gleason's Pictorial Drawing-Room Companion*, found its cover for July 24, 1852, dominated by a spectacular, full-length, engraved portrait of newly-deceased statesman Henry Clay. His obituary credited this "excellent likeness" to an original daguerreotype by Meade Brothers, New York. Charles Richard and Henry William Mathew Meade were already familiar figures to readers. Their own, very handsome likenesses had graced "The Brothers Meade," an article in the June 12th issue. These talented daguerreotypists, dealers, manufacturers, and instructors, became celebrities in their own right. Their fame was obscured and much of their legacy lost due to the early demise of both brothers. For this reason and because inadequate labeling may result in surviving pictures being credited incorrectly or to "photographer unknown," critical analysis is very difficult. Nevertheless, from their firm's establishment in Albany, New York in 1842, through the period following its 1850 relocation to a magnificent gallery in New York City, at 233 Broadway, the achievements of Henry and Charles Meade rank them among the most important of professional daguerreotypists and early photographers. The largest collection of their work is at the National Portrait Gallery, Washington, D.C.

In *Esquisses Photographiques*, Ernst Lacan took note of the superiority of Meade Brothers' pictures and the great interest of French daguerreotypists in their technical excellence. Charles R. Meade published an account of how this was achieved in the prestigious journal edited by Lacan, *La Lumiere.* He revealed that Meade Brothers used Voigtlander and French lenses, an American camera by Fisch with a lens 6 inches in diameter, and either French star or Christofle (scale) plates. He described the Meade method of preparation and development in detail and noted that the extra work of electroplating star plates (with the aid of a battery by Farmer) could be avoided by using the Christofle brand. Charles also discussed lighting and backgrounds used by the Meades and said exposure time for a half plate on a beautiful day was about twenty seconds and a little more if the weather was gloomy.

Ballou's, the successor to *Gleason's,* boasted that its engraved likenesses of the Misses Fox, the Rochester spirit rappers, were from a daguerreotype by Meade Brothers "and are therefore reliable." Lola Montez inscribed a copy of a Meade picture as follows: "I consider this lithograph the best likeness I have yet had taken of myself." A review of three portraits displayed at Ernst Lacan's Paris home indicated that their appearance could only be compared to Antoine Claudet's work and that "By a very special arrangement of the light, by the care brought to the polishing, by the artistic choice of the pose, Messrs. Meade give to their portraits a relief which recalls the illusion of the stereoscope. When one has seen these beautiful plates, one understands the reputation that these artists have made for themselves in America and the value that is attached to their works" (Gaudin, Charles. "Réunion Photographique," in *La Lumiere*, February 24, vol. 1, 1855, 29–30, [Paris], J. Lafitte, 1995). The brothers also composed allegorical and genre works such as a group of scenes illustrating Europe, Asia, Africa, and America and the "Seven Ages of Man," after Shakespeare, a series of tableaux taken by Charles.

Henry toured England, France, and Germany on business in 1847–48. On Charles's subsequent trip, later in 1848, he visited Bry-sur-Marne, France, and charmed Daguerre's niece, Georgina Arrowsmith, into persuading the inventor to pose for some very rare and important daguerreotypes. One day, Charles arrived to find Daguerre working in his garden and announced that he had come to take his portrait. Daguerre immediately complied, changing into a white shirt and tie, dark vest, and formal coat with the Legion of Honor on one lapel. Charles took eight or possibly nine portraits on this occasion. During his visit, Daguerre showed Charles the first daguerreotype, a view of Bry, and told him how it was made. Charles left two originals in Europe, gratefully giving one each to Daguerre and his niece, and brought the rest home. One was displayed at the Meade gallery, whose collection would eventually include John Quincy Adams, Franklin Pierce, James Buchanan, Millard Fillmore, Napoleon III, Louis Kossuth, Commodore Perry, Sam Houston, Jenny Lind, Catherine Hayes, Edwin Forrest, Charlotte Cushman, Billy Bowlegs, and many others. From views of Niagara Falls, Broadway, and a moving train shown as if still, to H. K. Brown's equestrian statue of Washington in Union Square, and panoramas of regiments in City Hall Park, the Meades also took many fine outdoor pictures. "Meade Brothers, American Daguerreotype Galleries" reflected their patriotic theme as did the carpet with the eagle and stars chosen for their Williamsburgh branch. At the Washington Monument may be seen the block they donated; it is inscribed simply, "To Washington, An Humble Tribute, From Two Disciples of Daguerre."

On another European trip in 1853, Henry received sets of new medals from America with profiles of Henry Clay and Daniel Webster as they appeared on Meade daguerreotypes. He was to present them to Queen Victoria and Emperor Napoleon III. In London, he met the most important daguerreotypists and at a Lacan soirée in Paris, Henry displayed a Meade daguerreotype of Levi Hill. *La Lumière* reported that it was "one of the most beautiful plates we have seen" and that distinguished attendees such as Nièpce de St. Victor, another color experimenter, studied Hill's appearance with great interest. Meade Brothers had demanded Hill

show his "hillotypes" to fellow daguerreotypists; one of those who would see them was Charles R. Meade. Both brothers were honorary members of the Societe Libre des Beaux Arts and Henry brought funds they had collected for its proposed monument to Daguerre and Nicephore Niepce. He visited Daguerre's widow and niece at Bry, took pictures of Daguerre's chateau and grave monument, and operated in his laboratory.

When last in Europe in 1854–55, Charles visited London and studied new photographic processes in Paris. On June 8, 1855, he took his own daguerreotype of Rachel, star of the Comedie Francaise, as Phedre, when she came to have her portrait taken by the studio of Mayer and Pierson. Similar arrangements allowed him to take tragédienne Adelaide Ristori, also rumored to be coming to America, the King of Portugal, and Rossini. He took outdoor photographs of Notre Dame, the *Palais de l'Industrie,* and the *Cirque de l'Impératrice*, all published in the *Photographic and Fine Art Journal*, and stayed long enough to arrange the Meade exhibit at the Exposition Universelle. The following year, Charles invented a process for taking photographs on silk.

RITA BOTT

Biography

The Meade family arrived from England at the port of New York on November 7, 1834, on the ship *Philadelphia*. They lived in Troy, New York, and later moved to Albany. In their daguerreotype business, Henry W. M., b. London, c.1823, and Charles R. Meade, b. London, April 11, 1826, were assisted by their father, Henry Richard, and their sister, Mary Ann Meade, both daguerreotypists and photographers. Henry R. claimed to have helped start the firm in 1841 in a petition for financial support made to the National American Photographic Association in 1872. Mary Ann, who ran the business in its last years, died January 17, 1903, and was described as "the first woman to have practiced the art of Daguerre" in her *Brooklyn Eagle* obituary. Both she and her father were pictured on Meades' "Frontispiece for Albums" with Daguerre, Niepce de St. Victor, Charles R., and Henry W. M. Meade. The whole family, including their mother, Mary Ann, lived at 233 Broadway, New York, after relocating from Albany in 1850 and until each brother married. Charles married Marietta F. Roff on June 17, 1851, and they had two children, Kate F. and Henry A. Meade. Henry W. M. Meade married Sarah Meserole on September 7, 1853; their two children were Sarah and Jessie Meade.

Meade Brothers began in 1842 at a Douw's Building in Albany, New York, and moved to the Exchange in 1843. In addition to taking pictures, offering instructions, and producing cases and other items in their "manufactory" for sale and their own use, they became major importers and dealers of equipment and supplies. They operated branches in Buffalo, Saratoga Springs, and possibly Canada for a time but relocated completely to 233 Broadway in 1850. In July, 1853, they opened a branch in Williamsburgh, L. I., (later Brooklyn) at 1st and South 7th Streets. The 1855 New York State Census reported that the Meade firm's annual product of daguerreotypes was valued at $15,000, its tools and machinery at $1,500, and its stock at $10,000 [$1: 1855 = $22.46: 2006]. It experienced financial difficulties as early as January, 1857 due to Charles being ill with tuberculosis. After spending the next winter in Havana, Cuba, he died at St. Augustine, Florida, on March 2, 1858. Business remained difficult and a branch at 805 Broadway was unsuccessful. The main gallery was refitted and operated through the war years. After Henry died in New York on January 25, 1865, Mary Ann continued the business for another four years.

The firm won one gold, five silver (one for calotypes in 1848), and one bronze medal from the American Institute and a diploma from the New York State Agricultural Society. Complimentary letters were received from Daguerre; Lola Montez; Fletcher Webster; Louis-Philippe, King of the French; Emperor Nicholas I of Russia; Queen Victoria; and Napoleon III for receipt of either Meade pictures or medals based upon them. They exhibited twenty-four daguerreotypes at the Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851) and won "Honorable Mention" for their exhibits at the Great Exhibition, New York (1853–54), and the Exposition Universelle, Paris (1855).

See also: Daguerre, Louis-Jacques-Mandé; Hill, Levi L.; and Lacan, Ernst.

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MEDICAL PHOTOGRAPHY

Medical photography is a broad term that encompasses photographs of patients, ward and operating theatre scenes, photomicrography, portraits of doctors, etc. The term 'medical' is synonymous with the word 'clinical.' Medical photography is however, the term most commonly used to refer to photographs of patients, diseased body parts, organs, and specimens. Medical photographs, i.e., those with a clinical content, are images of somatic diseases of the body and are distinct from images of clinical psychiatric diseases. Although the apparent visual signs of disease were often the main reason that led to the photograph being taken, in the final image, the pathology may only appear as an incidental element, disguised in conventions of nineteenth century portraiture. Many of the clinical conventions that we associate with medical photography such as the before and after shot, plain backgrounds, or the black box placed over the patient's eyes did not develop until the late nineteenth century. Improvements in photographic technology also helped the medical-clinical photograph to become part of a clinicians teaching collection and or clinical records.

Writing in 1931, Josef Maria Eder published an account of the history of photography in Europe, which was later translated by Edward Epstean in 1945 (Eder 1931). In the chapter on scientific photography, Eder describes what he believes to be one of the first applications of photography to medicine. This was in the field of photomicrography. He outlined the pioneering work by the French physician Alfred Donné (1801–1878) demonstrated in his cytology atlas, *Cours de Microscopie* (1845), made with Jean Bernard Léon Foucault (1819–1869).

One of the earliest clinical portraits identified by many was a calotype taken by the eminent Scottish photographers, David Octavius Hill (1802–1870) and Robert Adamson (1821–1848), sometime between 1843 and 1847 (Wilson 1973). The image is taken directly face on to the sitter, and cropped above her waist, perhaps in order to draw the attention of the viewer to the upper half of the body. Wilson suggests that:

> [T]he clothing around her neck has been drawn back to show the goitre. This photograph contrasts strongly with their other works, in which artistic arrangement of the sitter is a main consideration. This must be one of the earliest clinical photographs, if not indeed the first. (Wilson 1973, 104)

Wilson attempts to contextualise the image by suggesting tentative links between Hill and Adamson and Dr James Inglis (1813–1851), who had an interest in goitre. However, if one looks at this photograph within the broader context of Hill and Adamson's work it becomes apparent that the sitter's dress and bonnet are strikingly similar to those worn by fisherwomen in Hill and Adamson 'Newhaven' photographs, taken during the early-to-mid 1840s.

In general histories of photography, little reference is made to medical-clinical photography. Those who do, on the whole, tend to cite Dr Hugh Welch Diamond's (1809–1886) psychiatric portraits taken at the Surrey County Asylum in Twickenham. Using Frederick Scott Archer's (1813–1857) wet-collodion process, Diamond used photographs for diagnostic purposes and case notes. He also showed the patients their photographic portraits following treatment for therapeutic purposes.

Heimann Wolff Berend (1809–1873) was another doctor who used photography as part of his clinical practice from the 1850s. Berend founded an orthopaedic clinic in Berlin and employed a professional, L. Haase to photograph his patients before and after surgery. Berend's collection contains hundreds of photographs which combine both portrait and clinical conventions.

Many medical men began to publish their photographic endeavours in books and medical journals. Theodor Billroth (1829–1894) the Viennese surgeon and pioneer in abdominal surgery began to use photography while working at the Chirurgische Klinik in Zürich. During the 1860s he employed J. Ganz to take stereoscopic photographs to accompany cases notes published in 1867 (Gernsheim 1961). Similarly the French neurologist, Dr Guillaume Amand Benjamin Duchenne (1806–1875) was a pioneer in the use of photography as a medium for observation, representation and knowledge in medicine. Duchenne photographed patients undergoing electric stimulation of their facial muscles and published the results in his book *Mécanisme de la Physionomie Humaine* [The Mechanisms of Human Facial Expression] in 1862. In the same year he published a book containing images of pathological cases including ataxia. Duchenne de Boulogne was one of the first to use clinical photographs in his book on neurological disorders published in 1863.

In the field of dermatology Alexander Balmano Squire (1836–1908) published *Photographs* (*Coloured from Life*) *of the Diseases of the Skin* in 1865. Inspired by Squire's work A. Hardy (1811–1893), a doctor at the

Fox, George Henry. Photographic Illustrations of Cutaneous Syphilis (1 of 48).
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

St. Louis Hospital in Paris employed his former pupil, A. de Monteméja, to run a photographic studio within the hospital during the 1860s. They built up a large teaching collection of dermatogical photographs and stereoscopic images.

> In America during this period Surgeon-General Hammond had decreed that photographs should be taken of the casualties of the American Civil War (1861–1865). One of the world's largest collection of medical photographs, many of which are *carte-de-visite* [visiting cards] are now preserved at the Army Medical Museum in Washington, D.C.

Richard Leach Maddox's (1816–902) improved dry-plate available from the early 1870s encouraged and advanced the progress of photography in hospitals and other institutions. The neurologist Jean Martin Charcot (1825–1893) established a photographic Service Laboratory at La Saltpêtrière, Paris in 1878. Charcot installed Albert Londe (1858–1917) as the director of the Laboratory. In 1893 Londe published one of the first texts dedicated to medical photography entitled *La Photographie Médicale* [Medical Photography].

The in-house photography of the hospital also aided the move from commercial photographic portrait to clinical photographic conventions. Teachers, clinicians, researchers, and students used photographs of patients' bodies and their abstracted parts to visually enrich medical teaching. In Alison Gernsheim's 1961 account of the history of medical photography she states that 'I am unable to say when photography was first officially recognized by an English Hospital. St Bartholomew's Hospital at any rate had by 1893 a large number of photographs' (Gernsheim 1961, 2, 149). In Scotland, the eminent surgeon William MacEwan (1848–1924) had began taking photographs for use in his Private Journals and a collection of clinical photographs from the late 1880s which he added to throughout his teaching career at the Glasgow Royal Infirmary and later at the Glasgow Western Infirmary. MacEwan built up a collection of over seven hundred photographs covering a variety of subjects including rickets, carcinoma and hernia. The photographs were mounted on boards with case notes written on the verso. On his death his collection continued to be used and added to by his son Dr John A.C. MacEwan (1874–1944) and his colleagues at the Glasgow Royal Infirmary.

Not all medical men however, were willing to take photographs and in some instances portrait photographers would be brought into the hospital to photograph the patients or the patient would be sent to the local portrait studio.

Towards the end of the nineteenth century photography had found its way into medical journals, hospital wards journals, pathological reports and so on. Some began to devise technology that would allow them to take specialist photographic images of the body for example the human retina was photographed in 1885 by W.T. Jackman and J.D. Webster used a camera attached to a patient's head with an opthalmoscopic mirror in front of the lens; a long exposure of over two minutes was required. In 1887 Eadweard Muybridge (1830–1904) using a chronophotographic technique produced a series of images capturing the movement of subjects walking with a pathological gait.

As a subject the history of medical-clinical photography has been discussed in several fields including the history of medicine, the history of photography and medical photography, and theoretical debates from the history of art and visual culture.

Historians of medicine have been preoccupied with discussing the role of images as sources, focusing on problems of interpretation, and have, for instance, been keen to adopt theories derived from the history of art and visual culture. Discussions by historians of art and visual culture are often concerned with the 'status' of the photograph, and whether it can be understood as an 'objective document' or simply as an aesthetic object.

Conversely, historians of photography and medical photography debate technical issues, as well as locating and describing the 'first' clinical photographs and or presenting them as a seamless chronological narrative. Creating such a linear account involves leaping from one medical speciality to another, ignoring the possibility that each discipline such as orthopaedics, dermatology, etc., may have its own particular ancestry, influences and development.

It was not until 1961 that the first survey dedicated to the history of medical photography was written by Alison Gernsheim, and published in two parts (Gernsheim 1961). Since then the analysis of medical and clinical photography has thrown up dedicated historians of medical photography, resulting in attempts to go beyond identifying the first medical and clinical photographs, creating a wider debate on how they can be interpreted and used within historical research. One of the most prolific writers on this subject is Dr Stanley B. Burns. In 1988 Burns, together with Joel-Peter Witkin, an artist and photographer, published *A Morning's Work*, a selection of nineteenth-century medical photographs from the Burns Archive (Burns 1998).

The work of historians of art and visual culture relating to photography has arguably had the most impact on the way historians of medicine have considered clinical photographs. Many theories derived from the history of art and visual culture have debated the artistic-scientific-mechanical nature of photography. There is a vast body of literature, which aims to encourage us to 'look' in particular ways.

John Tagg argues that medical-clinical photography was a representational act rather than a creative undertaking (Tagg 1988). Tagg applies Michel Foucault's theories concerning observation, realism and objectivity in his exploration of the clinical gaze in nineteenth-century photography. He argues that technical advances, which occurred during the mid-to-late nineteenth century, facilitated the expansion of photography into medicine (Tagg 1984). It was within new institutions of knowledge, such as the hospital, that photography was to become perceived and accepted as a form of truth and evidence. Tagg's argument implies that the medical profession as a whole accepted photography as a medium of truth. However, in reality there was no consensus. Arguments for and against the use of photography were regularly reported in nineteenth-century medical periodicals such as the *British Medical Journal* (*BMJ*) and *The Lancet*.

The historian of art, Martin Kemp, encourages us to look at the details in medical photographs with a more discerning eye. Kemp's work has done much to stimulate debate concerning the history of photography (Kemp, 1988). He argues that individuals were faced with a series of photographic choices, which included staging, exposure and printing. By analysing each of these criteria one can gain insight into 'accessory and contextual information' (Kemp 1988, 123). Kemp suggests that the inclusion of details, such as the patient's clothes, are medically, but not socially, redundant. The border information in an image contributes to an understanding of the practice of medical photography. Kemp describes such details as 'accessory images.' It is the posing of the patient, clothes, and setting which reflect both 'conscious and unconscious choices' of the photographer. He is keen to point out that 'it was not so much that any doctor could simply become a photographer from the first, special skills and knowledge were involved in the production of photographs of the desired technical quality but rather that a layer of artistic mediation was eliminated' (Kemp 1988, 123).

Integrating images into historical research poses many problems for historians of medicine. As previously mentioned, Daniel Fox and Christopher Lawrence alerted us to potential pitfalls, such as presenting images in the form of 'coffee table books' or simply reaffirming what has already been said in the accompanying text (Fox & Lawrence 1988, 6).

Many previous studies have been content with presenting a visual and seamless chronological narrative of medical-clinical photography, irrespective of its local contexts of production, use and circulation. The contextual approach, emphasizes the need to analyze and relate images to their local contexts of production and circulation. This approach can be taken further by expressing visually the narratives that exist between photographs, images, text and artifacts. This not only encourages image-based research, but presents the results in a convincing, discursive and creative way.

PAULA SUMMERLY

See also: Duchenne, Guillaume-Benjamin-Amand; Gernsheim, Alison; Hill, David Octavius, and Adamson, Robert; Muybridge, Eadweard James; Calotype and Talbotype; Dry Plate Negatives: Non-Gelatine, Including Dry Collodion; Dry Plate Negatives: Gelatine; Cartes-de-Visite; Chronophotography; and Photomicrography.

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MÉHÉDIN, LÉON-EUGENE (UNKNOWN)

French photographer

Léon Méhédin remains somewhat of an enigma. He was a French national but the place and date of neither his birth nor death are known.

His name first appears at the time of the Crimean War, linked with that of Colonel Charles Langlois, who hired him to assist with the taking of reference views which would later serve as the basis for Langlois' panorama painting of the *Taking of Sevastopol*, a successor to his already celebrated painting of the siege. The painting commission came from Napoleon. Some of their work is jointly credited, while other images are credited to Méhédin alone.

Méhédin's wide panoramic vistas of the destruction in the city are powerful reminders of what has been described as the first modern war. Amidst the desolation and the abandoned gun carriages, the exposure has just been short enough to preserve the image of the French flag.

Becoming interested in the potential of the panorama, he continued to produce fine studies including the aftermath of the Battle of Tchernaya.

While in the Crimea, Mehedin also collaborated with Friedrich Martens on several photographic excursions in the areas surrounding the ruined Malakoff Fort and the Redan. These may also have served as reference for Langlois.

JOHN HANNAVY

MEISENBACH, GEORG (1841–1912)

German etcher

Georg Meisenbach was born on May 27, 1841, in Nuremberg, as the son of a copper etcher and pub owner. A talented draftsman from early youth, he learned etching in copper and steel in Nuremberg and, working for several renowned companies, making himself a good name. In 1874, he moved to Munich where he started working on experiments with Gillot's zinkenite lithography. Cooperating with a number of printers and financial advisers, Meisenbach managed to develop his form of grid lithography after photographic images in 1881 and gained worldwide patents for it in 1883, parallel to the patent by Angerer & Goeschl from Vienna. The process consisted in preparing the printing plate by an exposure through two plates of very finely lined glass which converted any greyscale into small squares of different diameter. Meisenbach's business partner Josef Ritter von Schmaedel called grid lithography the "autotype process". The first publication of the autotype process was the catalogue to the exhibition of electricity in Munich in 1882, combining two of the most important media of modernity. Schmaedel helped Meisenbach to construct a machine for lining glass in 1883. Restlessly experimenting Meisenbach spent the rest of his life in devotion to the autotype process and its adaptation to any technical progress imaginable. Georg Meisenbach died in 1912 in Munich.

ROLF SACHSSE

MELHUISH, ARTHUR JAMES (1829–1895)

Arthur James Melhuish was born in London in 1829, he married in 1853, and had three sons and four daughters. Melhuish was a photographer, publisher, a portrait painter, picture dealer, and a designer of photographic apparatus. He joined the Photographic Society in 1856.

His photographic studio was his principal activity and he opened his first in Blackheath, Greenwich, in 1857, later moving to 12 York Place, Portman Square in 1863, and then Old Bond Street, and Pall Mall, all in London. This latter studio was renamed Melhuish and [James] Gale in February 1894 and lasted until Melhuish's death. Melhuish was secretary of the Amateur Photographic

Association from 1861 to 1889 the formal role giving him, a professional photographer, access to Royalty and to London fashionable society and scientific community. In 1873 he was created Photographer Royal to the Shah of Persia following his visit to London.

In addition to his main business as a photographer Melhuish formed partnerships with Thomas Miller McLean and Robert Peters Napper trading as McLean, Melhuish, Napper and Co at 26 Haymarket from 1859 until September 1861 when Napper left the firm; as McLean, Melhuish & Co.; as McLean, Melhuish & Haes, when Frank Haes joined in September 1861 until March 1863 when Melhuish left. These firms seem to have been both photographic studios, with coloured photographs a speciality, and extensive publishers of photographs.

Melhuish contributed photographs to various publications such as *The Stereoscopic Magazine* (1858–1865) published by Lovell Reeve, the Howett's *Ruined Abbeys and Castles of Great Britain* (1862) and he also printed the stereographs tipped-in to Piazzi Smyth's *Teneriffe* (1858) also published by Lovell Reeve. He exhibited widely in a personal capacity and through his businesses and was patronised by the Albert, Prince of Wales in the later 1850s on several occasions.

Melhuish patented three significant pieces photographic equipment. In 1854 (patent number 1139) he designed, with Joseph Spencer, a photographic roll holder using sensitised paper. This was described to the Photographic Society in 1856, demonstrated to the Prince of Wales and was used by Frank Haes when he photographed at London zoo. In 1859 two patents (numbers 2557 and 2965) related to the construction of cameras in metal. This was the first all-metal camera and one extant example resides in the collection of the National Museum of Photography, Film and Television in Bradford. The *Photographic News* reported on the camera in 1859.

Away from photography Melhuish started the *Church of England Pulpit and Ecclesiastical Review* in 1873 and published articles on a diverse range of subjects such as mental analysis, ghosts and the geology of the bible. He was an Honorary Fellow of the Meteorological Society and elected a Fellow of the Astronomical Society in 1863.

He died in Brondesbury, London, on 1 November 1895 leaving an estate valued at £794.

MICHAEL PRITCHARD

See also: *Photographic News (1858–1908).*

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MERLIN, HENRY BEAUFOY (c. 1830–1873)

Australian

Henry Merlin is thought to have arrived in Sydney in December 1848 but may have been a newspaper reporter in Norfolk in 1851 who arrived in Australia in 1853. Speculation exists as to his prior and subsequent activities. In 1863 Merlin married in London and possibly learnt photography for in 1864 he was established as a travelling photographer in South Victoria and Victoria and by 1866 was trading as the American and Australasian Photographic Company (A.&A.Co). Such American references in brand names were popular in the gold rush era. Merlin employed an assistant, Charles Bayliss (1850–97) and together they set out to photograph house to house throughout Victoria and New South Wales. The pair worked their way north inland to Sydney where the studio was located from 1870.

In March 1872, the Merlin followed the gold rush to Hill End west of Sydney where he met the enriched German-born immigrant miner Bernard Otto Holtermann. The latter appointed Merlin official photographer for the Holtermann International Travelling Exposition, a massive photographic documentation of the colony, later shown at the 1876 Philadelphia Centennial exhibition. Merlin's involvement however, was cut short by his premature death in Sydney in September 1873. The main work fell to Bayliss. Merlin also excelled in journalism with many articles appearing in the *Town & Country Journal*.

A large collection of A&A Co negatives is held in the State Library of New South Wales but surviving prints are mostly cartes de visites, often faded.

GAEL NEWTON

MESTRAL, AUGUSTE (1812–1884)

French photographer

Until very recently, practically no biographical information was available on this photographer, who was active in France in the late 1840s and early 1850s. Even his first name was veiled in mystery. The initial O, which has frequently been mentioned since the 1970s, seemed not to appear in a single nineteenth-century document. Research carried out in the context of two major 2002 exhibitions—on the *Mission héliographique* and on Gustave Le Gray, with whom Mestral was befriended and collaborated—resulted in a rudimentary insight into his life. It seems that he was born in 1812 in the Jura region, that he adopted the family name of his mother's former husband and that he became a clerk after having studied law. He established himself in Paris in 1844 and from 1848 onwards he was reputed

to be a successful maker of daguerreotypes. In spite of the long-time mystery of his name and life, Mestral's contribution to the history of photography should not be underestimated. In 1851, he was one of the forty founding members of the Société héliographique and, three years later, one of the ninety-three founding members of the Société française de la photographie. His name appeared frequently in the pages of the journal of these associations, *La Lumière*, especially during the years 1851–1853. The journal reports, for instance, that Mestral announced some technical improvements at several occasions. It was also written that he was part of a commission responsible for the compilation of the *Album de la Société héliographique*, in which all members were directed to submit their pieces so that progress could be observed from day to day. In addition, it was stated that he occupied himself with reproductions on paper of vast amounts of daguerreotypes.

By that time, Mestral had gained a reputation with the quality of his portraits, first on daguerreotype, later on paper. In *La Lumière*, the critic Francis Wey spoke of a collection of about 1,200 portraits—none of which survived or could be identified—and mentioned their "intimate, familiar and true aspects, which unmistakably betray[ed] the spiritual kind-heartedness of their author." Wey also mentioned some landscapes and he favourably described a view representing the canal sluice in Thoraise, on the borders of the Doubs, Mestral's native region. A similar photograph that survived, taken around 1853, illustrated Mestral's talents as a landscape photographer: he succeeded in evoking the play of light on the foliage and the water surface while structuring the composition by means of a stable foreground.

Mestral's name, however, was first and foremost connected with what later has been labelled the *Mission héliographique*. This famous assignment, issued by the *Commission des Monuments Historiques* in 1851, consisted of photographing an impressive series of medieval churches and monuments from classical antiquity. This impressive task to record the highlights of French architectural heritage by means of the new medium of photography, was assigned to five members of the Société héliographique, who all became key figures in nineteenth century photography: Edouard Baldus, Hippolyte Bayard, Henri Le Secq, Gustave Le Gray, and Mestral. It is not clear how Mestral became involved in the project since he was known for his portraits and no references are made to pictures of historical monuments prior to the 1851 mission. Initially, there was probably some hesitation among the Commission as well. At a certain stage in the preparation, his name disappeared from all documents but, eventually, Mestral was assigned with the fifth mission, which included photographing monuments in the regions of the

Mestral, Auguste. Angel of the Passion, Sainte-Chapelle, Paris. *The Metropolitan Museum of Art, Gilman Paper Company Collection, Purchase, The Howard Gilman Foundation Gift, 2002 (2002.9) Image © The Metropolitan Museum of Art.*

Charente, Dordogne, Gironde, Garonne, Tarn, Aude, Eastern Pyrenees, Lot, Chorèze, Haute-Loire, Puy-de-Dôme, Nièvre, and Cher. Mestral, however, decided to join forces with Le Gray, who was assigned with the fourth mission, which followed a more western itinerary. Mestral had close connections with Le Gray, certainly since 1848 and maybe even since the early 1840s. In his 1854 treatise on photography, Le Gray mentions Mestral as one of his pupils and he also made a portrait of Mestral, which survived. One can only guess about the specific nature of their collaboration for the Mission but it is probably wrong to assume that Mestral, who had acquired a reputation at that time, was only an assistant to Le Gray. Precisely because they joined forces, they succeeded in taking multiple views of a single building. Making full use of the new technique of dry wax paper, which was developed by Le Gray a few months before, they took about thirty views on a

single day, which was really exceptional in those years. Sometimes, there were only minor differences among several shots, but as the journey progressed, more different views and fragments of a building were taken. Their collaboration resulted in some true masterpieces of nineteenth century architectural photography, such as their view of the Grand staircase of the castle in Blois, which was exhibited in London in 1854, their pictures of the Cloister of Moissac, or their photographs of the fortifications of Carcasonne.

After his participation to the Mission, Mestral continued photographing monuments. Without receiving an official commission, he explored Normandy and Brittany—both regions ignored by the Mission—in 1852. Henri de Lacretelle wrote lyrically about these pictures in *La Lumière* in 1853 and he praised in particular Mestral's talent to render both details and a general view. In addition, Mestral directed his gaze at the restoration of the Notre Dame of Paris, where he photographed the sculptures of Victor Geoffroy-Dechaume in 1854.

STEVEN JACOBS

Biography

After a long period of obscurity about essential biographical data, it recently turned out that he was born in Rans (Jura) on March 20, 1812, as Thérèse Jean-Baptiste Augustin, aka Auguste Mestral. He is the son of Pierre and Jeanne Françoise Poux, the latter was a widow of a certain Claude Etienne Mestral. After finishing law studies in Dijon in 1833, he becomes a clerk in Paris and Ecouen successively. It is possible that already here, around 1840, he meets Le Gray, who was an assistant of Mestral's predecessor. In 1844 he establishes himself in Paris, where he gains reputation as a portraitist. A founding member of the Société héliographique, he contributes to the Mission Héliographique in 1851, photographing monuments together with Le Gray. All that time, he has his studio in the Rue Vivienne in Paris. In 1856 he leaves the capital and, probably, photography as well. Many of his negatives are left to his friend Ernest Moutrille, a Besançon banker and amateur photographer. He turns up in Rans, where he marries in 1858 and lives from his fortune. He dies the first of March 1884.

See also: Mission Héliographique; Le Gray, Gustave; Société héliographique; Société française de photographie; Wey, Francis; Baldus, Édouard; Bayard, Hippolyte; and Le Secq, Henri.

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MEXICO

The first photographs taken in Mexico were made by Jean François Prélier, a French engraver living in Mexico City, who returned from a trip to France with two cameras in December of 1839. He demonstrated the new daguerreotype process when he debarked in Veracruz, and shortly after his return to the capitol he took the first photograph of Mexico City—a view of the cathedral—on January 26, 1840. Thus, the first photographs made in Mexico were taken barely six months after the invention of the daguerreotype had been announced in the Mexican press (June 1839). The fact that they were made by a foreigner foreshadowed the development of photography in Mexico in the nineteenth century that resulted in a history as we now know it dominated by foreign names, particularly those of French, German, and American photographers. The reasons for this were twofold: first, from an economic perspective cameras were costly and bore high import taxes, and Mexican society lacked the well-educated middle class from which photography initially drew its ranks in England, Europe, and America. Second, for most of the nineteenth century Mexicans used photographs primarily as a private celebration of family and community, whereas foreigners were keenly interested in photographing Mexico's monuments, landscape, indigenous peoples, and political events. In fact, in the nineteenth century, only Egypt attracted as many photographers as did Mexico. Because these images by foreigners tended to be made for public consumption—they appeared in a wide range of publications and were often readily available for purchase—they gained a worldwide currency that photographs made by and for Mexicans did not.

Within two years after Prélier's first photographs, photography had become a business in Mexico. Although itinerate photographers, who traveled the traditional commercial routes were plentiful, professional studios were beginning to open in the larger cities. In 1842 Randall W. Hoit was the first photographer to establish a studio in Mexico City. He was followed shortly thereafter by fellow New Yorkers Francisco Doistua, Andrew J. Halsey, and Richard Carr. Joaquín María Díaz González, the first native Mexican daguerreotypist, opened a studio on the Calle de Santo Domingo in 1844. In 1856 there were seven photographic studios operating in Mexico City, in 1860 there were over twenty studios, and by 1870 seventy-four studios were in existence.

The years of the French Intervention (1864–1867) saw the burgeoning of photography in Mexico. Tied to

the protocol of the court of Maximilian and the official documentation of political events, photographs were a way of legitimizing the emperor. The court brought the European carte-de-viste craze to Mexico, and portraits of Emperor Maximilian, Empress Carlotta, General Bazaine, members of the court, and its Mexican supporters circulated widely in Mexico and abroad. François Aubert, the official court photographer, made images of the court at play, during ceremonial occasions, and during war, following Maximilian up to his last moments. His images of Maximilian's execution and post-mortem portraits were banned in Europe, but nevertheless circulated widely.

Other French photographers active during this period included Jules (Julio) Amiel, Auguste Mérille, Jean Baptiste Prévost, and Auguste Péraire. Photographers Julio de Maria y Campo, José Pedebiella, and J. B. Parés came from Spain. Mexican-born photographers, many of whom had studied at the Academia de San Carlos in Mexico City, included Francisco Montes de Oca, Lauro Límon, Andrés Martínez, Luis Campa, Antíoco Cruces, Agustín Velasco, Joaquín and Maximino Polo, Luis Veraza, Manuel Rizo, and Julio Valetta. Although many of these men were initially trained as painters, photography became part of the annual salon at the academy in 1870, and shortly thereafter photographs were included in the exhibitions of the Arts and Trades School.

A major trend in Mexican photography during the nineteenth century focused on travel and exploration. Foreign photographers were variously interested in documenting the ethnographic, archaeological, and natural sights of Mexico. Their interest came out of a "rediscovery" of the Americas, initially a romanticized return to pre-Conquest lands, wild and untamed in comparison to archaeological sites in Europe and the Middle East. The Viennese Baron Emanuel von Friedrichstahl was the first of the archaeologist-explorers, making daguerreotypes of sites in the Yucatan in 1840. He was followed by John Lloyd Stephens and Frederick Catherwood, Désiré Charnay, Lord Alfred Percival Maudslay, Augustus and Alice Dixon Le Plongeon, and Teobert Maler. Charnay, who began his archaeological explorations in 1858, was the first to break with the romanticized conception of ancient Mexico and use photography as a tool for scientific research.

Charnay and anthropologist-explorers such as Léon Diguet, Carl Lumholz, and Frederick Starr made ethnographic portraits of indigenous peoples and recorded daily life. While these photographers purported to have a scientific mission, the resulting images are closely aligned to the genre of "tipos" or Mexican popular types that depict people according to social category, regional costume, or profession, and that had been produced by earlier photographers such as Aubert, who made a series of studio portraits of street vendors. The genre was popular among both native and foreign practitioners. Americans William Henry Jackson and Charles B. Waite and Frenchman Abel Briquet made numerous tipos and images of "Mexican scenes." The Mexico City firm of Cruces y Campa made a carte-de-visite series of staged Mexican scenes for the 1876 Philadelphia Centennial Exposition. Lorenzo Beceril, a native-born studio photographer in Puebla was well-known for his portraits of Tehuanas, the distinctively costumed women from the Isthmus of Tehuantepec.

Promotion of Mexico was another activity of those traveler-photographers who were patronized by the Mexican government and private entrepreneurs. Focusing their lenses on the future rather than the past, photographers such as William Henry Jackson, Charles B. Waite, Abel Briquet, and Guillermo Kahlo (father of Frida Kahlo), photographed progress. Their images of landscapes in transition showed a Mexico being changed by engineering projects such as telephone lines, tunnels, railroads, bridges, and dams. The work of these chroniclers of the modernization of Mexico often appeared in the guise of tourist views, since tourists were seen as potential investors. Their work also memorialized the achievements of the ambitious Porfirian government (1884–1910), and highlighted the natural resources that could attract foreign investors. These photographers were frequently commissioned to produce albums recording the development of railways, mines, and factories.

Photography as a means for documenting historical moments and disseminating news had existed in Mexico since daguerreotypes were taken of American troops and wounded soldiers in Saltillo during the Mexican-American War (1846–1848). Aubert's images from the French Intervention were of a certain documentary nature, and were used in Europe to report the news from afar. However, it was the Porfiriato that made extensive use of photography to record its accomplishments. A cadre of photographers such as Agustín Victor Casasola and Guillermo Kahlo were always on hand to document ceremonial occasions such as the dedication of buildings and public works. In 1896 Rafael Reyes Spíndola, owner of several newspapers, began to print photographs in his papers. As Mexico moved determinedly into the twentieth century, photojournalism rapidly developed as a means for both recording change and keeping the public abreast of events. By the end of the first decade of the twentieth century the tool that the Porfirian government had recognized and used so successfully had been used to document both its apogee and its demise.

BETH GUYNN

See also: Cruces, Antioco and Luis Campa; Daguerreotye; and Landscape.

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MEYDENBAUER, ALBRECHT (1834–1921)

German photographer

Albrecht Meydenbauer was born in Tholey, Saarland, on 30 April 1834, to the physician Albrecht Meydenbauer senior and his wife Friederike. In 1856–58 he studied architecture at the Bauakademie [School of Architecture] in Berlin and became a construction surveyor for the Prussian government. After an accident at the Wetzlar cathedral in 1858, Meydenbauer developed the idea that the direct measurement of sites could be replaced by indirect measurements using photographic images. In a memorandum, written in the fall of 1859, he laied out a project to photograph all Prussian monuments with the greatest detail and accuracy with the intention of gathering and protecting the images in an archive of cultural heritage. In the course of his work he designed a photogrammetric camera that combined a photographic camera with a measuring instrument and began testing it in 1867 with other scientists, on architecture and topographical views. 1885 Meydenbauer was called to the Prussian Ministry of Culture and founded the Königlich preußische Meßbildanstalt [Royal Prussian Photogrammetric Institute] in Berlin, the first institution worldwide for the photogrammatic documentation of architectural heritage. Between 1885 and 1920 the institute produced records of about 2,600 objects in nearly 20,000 photogrammetric images on glass plates, in and around Berlin and the Prussian territories until 1900, and then operating abroad (Athens, Baalbeck-Lebanon, Istanbul). Meydenbauer resigned in 1909 and moved to Bad Godesberg, near Bonn, where he died on 15 November 1921. The photogrammetric archive now resides in the Brandenburg Landesamt für Denkmalpflege [Landmark Preservation Office of the Federal State of Brandenburg] in Wünsdorf near Berlin.

STEFANIE KLAMM

MICHETTI, FRANCESCO PAOLO (b. 1851)

Francesco Paolo Michetti was born in Tocco di Casàuria (Italia) in 1851, and soon after his birth, his family moved to Chieti, where he later attended a technical school.

He was awarded a scholarship to attend the Accademia di Belle Arti (Academy of Art) in Naples, where he studied with the painter Morelli. After his studies he moved to Francavilla where he bought an ex-nunnery.

Francesco participated in the Biennale in Venice with the portrait *La figlia di Iorio*, in the Exposition Universelle in 1878, and in other expositions in Germany and in London where he displayed some of his paintings and statues. His style was similar to that of the current Verismo, but it wasn't until 1871 when he went to Paris that he devoted himself fully for the first time to photography.

He immediately understood the peculiarity of the two expressive means, and always emphasized the differences between the two techniques and their autonomy without submitting one to the other.

In the 1870s his subjects were static but after photographs become more like snapshots he devoted himself to reportage of life in Abruzzo from 1890 to 1895. He used photography not only as a way to make his paintings more realistic, but, together with painting, developed an instrument to describe natural life by giving his personal, subjective views.

After 1900 he stopped painting and devoted himself to photography.

CARLO BENINI

MICHIELS, JOHANN FRANZ (1823–1887)

Photographer

Michiels was born in Bruges (Belgium) on 4 October 1823 and he died on 21 January 1887 in Cologne (Germany). From around 1850 to 1859, Michiels worked in Bruges as a wood-carver and sculptor. He created the pulpit in the church of Saint-Jacques in Ypres and the pulpit in the church in Roesbrugge, both of which were destroyed during the First World War. He worked as wood-carver till 1843. During this period he had also become interested in photography after seeing daguerreotypes in Brussels.

Michiels became a photographer and publisher and

became famous for his photographs of city views, architecture and reproductions of art works. As an artist he used photography as a unique technique to make reproductions as a way to distribute this art.

Very well known are his photographs of the Flemish Primitives as is his view of the Quai Vert in Bruges (made in 1848), which is one of the oldest known photographs of Bruges, published by Blanquart—Evrard in the "Album de l'artiste et de l'amateur," 1851. During the years 1853–1854 he published the album "Variétés Photographiques." Some months later he left for Cologne (Prussia), but his main residence remained in Bruges however he later moved his domicile to Cologne in 1855 and became a Prussian citizen by naturalization the same year.

Museum art and the collection, classification and conservation of sculptures and other mediums became a new role for and subject of photography long before museums began to see photography themselves as objects of art. The photographer captured images of the building and its furnishings, but above all of the objects exhibited there. Michiels gained, in Cologne during the period 1852–1857, a fine reputation as an architectural photographer, thanks to his close collaboration with the publisher Franz Carl Eisen (1812–1861). He recorded the construction of Cologne Cathedral and published albums of the new stained-glass windows "Die neuen Glasgemälde im Dome zu Köln," five prints, 1853; "Album von Köln," fourteen prints, 1854; "Album von Berlin, Potsdam und Sans-Souci," sixty prints, 1857. These photographs were financially successful thanks to the commercial spirit and merchandising of Eisen who already had a flourishing business that sold graphic prints. An album of his reproductions of the shrine of Saint Ursula, 'Der Reliquienschrein der heiligen Ursula zu Brügge" with eight 22 × 31 cm albumen prints, appeared under the Eisen imprint in 1854 and in 1857, Michiels returned to Bruges.

Michiels' diplomatic skills won him a wide circle of upper class admirers. He was invited to teach photography to the crowned prince of Prussia, who later became de Emperor Friedrich III. He also had an exhibition as member of the Prussian delegation in Paris. During this period Michiels traveled to Russia to take photographs of works of art in the Hermitage Museum in Sint-Petersburg.

In 1858 he began with A. Laureyns an établissement photographique in Bruges, which found success for one year only.

During 1859–1860 he lived in Brussels working for several museums and had his photographs of works of art in the collections at European Museums published by Gestewitz in Düsseldorf.

The recognition of the history of art as a discipline was responsible for a renewed interest for Old Art and photography made a significant contribution to the rediscovery of Old Art. National heritage was transferred to a glass plate or a sheet of paper and subsequently disseminated to those interested. The search to find the best methods of reproduction of works of art stimulated the technical skills and even inventions in this field. Photography came in a position concurrent with gravure and lithography. But soon the photographic medium created its own place in artistic and contemporary debates; slowly but surely, photography became intertwined with the professional activities of lithographers and printers, while photographs became increasingly employed for illustrating of books and other publications.

From 1861 to around 1864 Michiels set up a studio in Brussels, Rue Neuve, 88. After the death of his son Bruno in 1863, he finally moved back to Germany and opened a shop selling art objects with two of his daughters.

His photographs of museums bear witness to the significance that was attached to these relatively modern institutions. In topographical surveys of cities and regions, pictures of museums were included alongside churches, palaces and old town halls. Museums had a symbolic function as guardians of material culture; they gave the nation its cultural identity, while serving as a major attraction for tourists in search of souvenirs.

He died in Cologne on 21 January 1887 and his funeral was held in the Dom in Köln.

JOHAN SWINNEN

See also: Photography and Reproduction; Blanquart-Evrard, Louis-Désiré; Photography of Paintings; Photography of sculpture, Architecture.

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MICROPHOTOGRAPHY

The term "microphotography" has been used to describe two very different processes. According to its etymology, the term microphotography should describe

extremely small photographs that are viewed through a microscope or magnifying lens. Throughout its history, however, the term has been routinely applied to photographs of microscopic subject matter large enough that they may be viewed unassisted. The later are more precisely termed photomicrographs and are dealt with in a separate entry.

History

In many ways the idea of combining the camera and the microscope was an obvious extension of the camera's innate potentials. Not only was the knowledge of lenses and light required by photography also required by the successful microscopist, but the projected image visualized through the microscope was analogous to that recorded in the camera. No less a pioneer than William Henry Fox Talbot (1800–1877) took photographs through the microscope as early as1835.

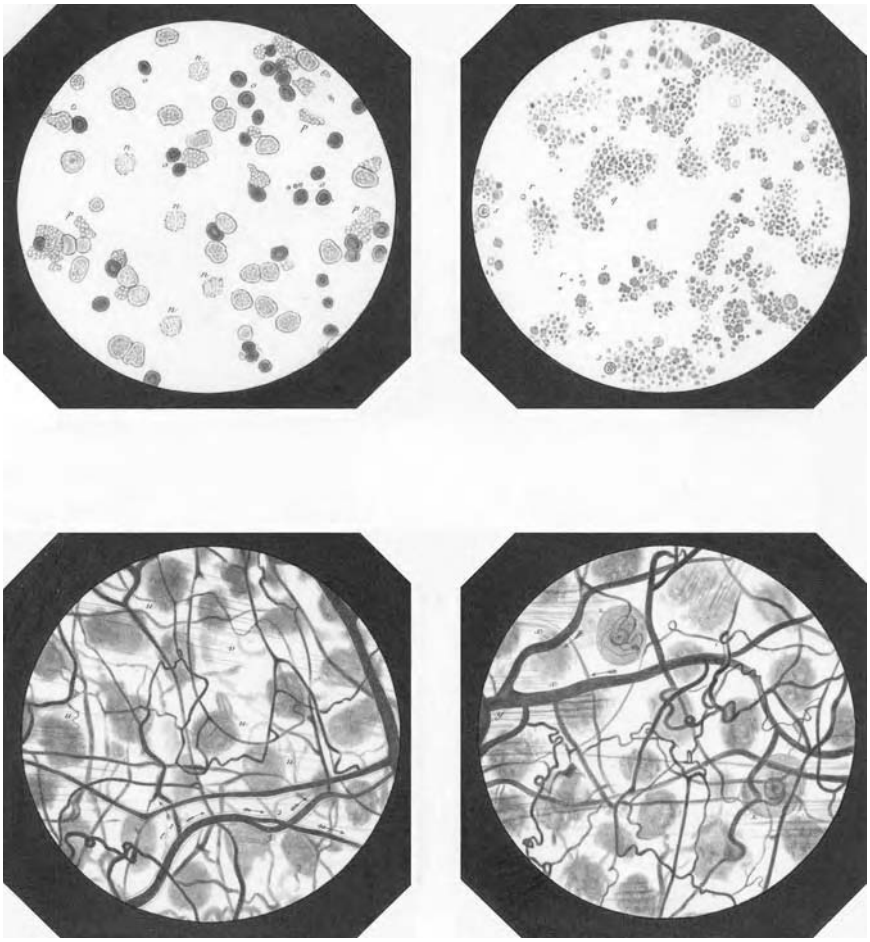
Logically, the process could just as easily be reversed, using the microscope lens to reduce rather than enlarge the image recorded by the camera. The resolution required to print an image so small, however, made the accomplishment more technically difficult. The earliest microphotographs were probably delicate, irreproducible daguerreotypes that have not survived. After these initial experiments the historical development of microphotography diverged from that of photomicrography because of the different use-value assigned to each. The value of preserving and sharing what was seen through the microscope as photomicrographs was clear. The microphotograph, on the other hand, seemed to many contemporaries to have no practical applications. George Shadbolt (1819–1901), who coined the name microphotography, was of the opinion that "microphotographs can never be more than amusing curiosities." Most microphotographs were indeed produced as novelties, and it is as a novelty product that microphotographs became a significant feature of nineteenth-century visual culture. The idea to use microphotography to reduce and store information as microfilms arose independently, and was not put into practical application until the 1930s.

Like many milestones in the history of photography, microphotography was most likely pioneered by several people working around the same time. John Benjamin Dancer (1812–1887), is generally credited with successfully producing the first microphotograph. Dancer was an optician, inventor and entrepreneur who specialized in producing optical equipment like microscopes and magic lanterns. Dancer's first successful microphotograph, a daguerreotype of a 20 inches long document reduced to 3mm in length, was printed in 1839. According to a later account, his technique involved using the eye of a freshly killed ox as a lens. The wet collodion process invented in 1851, with its excellent resolution and easy reproducibility, galvanized a new wave of experimentation. Dancer produced his first collodion microfilms early the following year. Although he lost a priority dispute with Dancer as to who could claim to be the inventor, Shadbolt was working in a microphotography around this time as well. He became the first to publish a workable microphotographic process in 1857. Others surely printed microphotographs as well, either out of curiosity or as demonstrations of technical acumen. Alfred Rosling, for example, exhibited pages of the *Illustrated London News* at the Photographic Society of London in 1853 to demonstrate the resolution of his lenses. Although they were not produced for that purpose, Rosling's microphotographs must be considered the first newspaper microfilms.

According to biographers, it was by accident that Dancer happened upon the idea to market microphotographs. When Edward William Binney asked Dancer to produce a photographic record of a memorial tablet, Dancer printed a microphotograph instead. Distributed to friends in early 1853, the image generated so much interest as to convince of microphotography's salability. Dancer's slide-mounted microphotographs quickly became a popular addition to the natural history slides and microscope equipment his company offered the bourgeois consumer. He offered microphotographs featuring local monuments, famous persons, and miniaturized texts like the Lord's Prayer. The subject choices reflect the microphotograph's status as an entertaining novelty destined for the bourgeois parlor, and simultaneously appeal to an implicit educational benefit to be derived from exercising one's faculties of visual observation.

Production of novelty microphotographs spread abroad when Sir David Brewster (1781–1868) toured Europe with examples of Dancer's work, which were displayed at the Académie des sciences in Paris and later presented to the Pope. The most prolific manufacturer was René Dagron (1819–1900) in Paris, who launched lucrative businesses selling images that were inset, along with a tiny, jewel-like magnifying lens in curios such as a signet rings, penknives, and religious charms. These trinkets, called Stanhopes, were immensely popular as souvenirs featuring a "hidden" vista that magically unveils itself to the knowing eye. Although popularity waned after the 1870's, Stanhopes remained in production through the 1970s.

The idea applying microphotography in preserving public records and library catalogs received rare mentions in periodicals as early as 1853. It was espionage, however, that provided the biggest impetus to the use of microphotography for information storage in the nineteenth century. In a 1857 article on the micrometer for the 1857 *Encyclopedia Britannica*, Brewster took up the theme in a way that echo in popular fiction for decades to come, writing that "microscopic copies of dispatches



Foucault, Jean-Bernard-Leon and O. G. Mason. Plate VI Cours de Microscope Complementaire des Etudes Medicales…Atlas execute d'apres nature au Microscope-Daguerreotype. *The J. Paul Getty Museum, Los Angeles*

and valuable papers might be transmitted by post, and secrets might be placed in spaces not larger than a full stop or a blot of ink." Microphotography was successfully employed to hide information from enemies for the first time in the Franco-Prussian War. In October 1870 Charles de Lafollye, of the Service de correspondences extraordinaires, assisted by Gabriel Blaise, produced the first microphotographic military dispatches. Messages were hand written in large script on cards and then photographed. The resulting prints were inserted in hollowed out quills and attached to a feather on a pigeon's tale. Later that year a letterpress was adopted for printing the messages, allowing copies to be kept which can be viewed in the Musée Postal, Brussles. Before escaping Paris in balloon named Niépce in 1870, Dagron was contracted to set up a similar pigeon post that would carry military and private communications back into occupied France. His prints represented a three-fold improvement over those of Blaise, recording the same amount of information on a sheet about 11×6 mm. Microphotography received more limited use in the American Civil War, where one regiment reportedly sent microphotograph dispatches across confederate lines pasted inside coat buttons. Noses, ears and fingernails became the hiding place for microscopic secrets in the Russo-Japanese war of 1904–1905. Brewster's prophecy was finally fulfilled during World War I, when messages were sent to spies hidden on top of printed periods and commas in magazines.

Microphotography in Nineteenth-Century Visual Culture

The instant demand Dancer and Dagron discovered for microphotographs may seem surprising if it were not for the immense desire to explore all modes of visuality that characterizes the latter half of the nineteenth century. This passion for new ways of seeing and being seen inspired the invention of myriad optical trinkets and devices that could exist anywhere on a continuum that ran between, but always blended, spectacular entertainment and educational intent. After the invention of the achromatic microscope in 1823, microscopy became an important element in this visual culture. Produced cheaply in the 1830s, microscopes became a common addition to the bourgeois parlor, where they offered a recreational activity that fit into a public campaign promoting the natural sciences as an appropriate

leisure occupation for those seeking self-education and improvement. The microscope slides produced for this audience, offering such sights as crystallized urine, blood cells, or an uncanny encounter with a housefly, offered access to a new visual domain and the opportunity to gain first hand experience of nature's inner truths. Studying nature in the nineteenth century was, above all, a visual process, involving extracting greater truths through visual observation and comparison.

The meaning of the microphotograph must be situated in this broader context of spectacle and optical entertainments. But where does the balance between scientific intent and specular indulgence fall with respect to microphotography's various forms? In one respect, the microphotograph was unlike its closest relatives, the microscope slide or photomicrograph in that it drew on a separate visual tradition. Whereas histology imagery would seem to invoke the scientific logic of precision and accuracy, the microphotograph offered pleasant illusions more akin to a magic lantern show. Dancer's roots as a producer of magic lanterns, and the easy fit between microphotographs and souvenirs support this idea. And yet observations taken through the microscope, recorded by whatever means, were considered to be of questionable ontological value by many contemporary scientists. Due to a lack of standardized documentation procedures, images of microscopic specimens were regarded at best as a highly suspect form of visual evidence. Photography did little to change this situation. The "objective" image recorded by the camera did not meet contemporary criteria for scientific accuracy and precision. Advocates from the domain of popular science, on the other hand, tended towards the grandiose in their estimation of the value of microscope images. They promote the edifying effects of gazing through the microscope objective both on aesthetic and scientific grounds. Moreover, in popular texts, microscope slides and illustrations were rarely organized and viewed in a way that could be called systematic or methodical. The average bourgeois viewer's experience with a microscope probably proceeded in much the same way. Microscopy and photomicrography both catered to a public whose appetite for new visual experiences outpaced its desire for education. In result, within the popular context the kind of attention directed to a microscope slide and a microphotograph seems closer than expected.

Contemporary discourse on microscopy offers reasons to further discriminate between the magical allure of optical trinkets like the Stanhopes and the practice of studying miniaturized photographs under the microscope. Microscopy between 1850–1870 was embedded in a cogent, power-laden political discourse on Nature that was used to recruit mass audiences for domesticated life science. In public discourse microscopic study was touted as an optimal means for training the public in a faculty it was sorely lacking—the ability to see independently and objectively, and thus develop vision into a tool of rational thought. Dancer's microphotograph slides often appeal to quantitative analysis, saying, for example, that 112 eminent men could be identified, or that a slide contains 1687 letters. The point was probably not to actually count but to suggestively appeal to this logic whereby microscopic study would develop the viewer's ability to synthesize discrete analysis and meta-observation.

The monuments, heroes, and landmarks featured in both souvenirs and slides likewise offer edifying content, yet seem to reveal a slightly different set of desires at play. The scopic pleasure offered must have been one of discovering what is human and familiar in the otherwise alien spaces of microscopic observation. It has even been suggested that these subjects reflect the colonial impulse of the age. Amateur literature on microscopy of the period is filled with reveries to the hidden worlds and exotic adventures the expanded vision microscopy made possible. If, therefore, amateur microscopy domesticated nature by bringing it into the space of the parlor, the projection of human artifacts and accomplishments into otherwise alien territories reads as a metaphoric attempt at domination.

Whatever the content of the image, the primary allure of the microphotograph was the possibility of experiencing a technical marvel. As tiny, perfect copies, microphotographs evince a pleasure akin to that offered by other kinds of miniatures including toys, dioramas, and staged panoramas. Souvenirs and religious effects appropriated this pleasure as a purely magical indulgence, whereas microphotography's other forms invite the viewer to play at being a scientist. Utilizing the microscope, focusing the objective, waiting for something to come into view, and scrutinizing the results, the viewer enacted the scopic logic of the natural sciences without actually submitting themselves to the intellectual rigors of scientific study.

STACY HAND

See also: Photomicrography; Nature; Science; Photographic Jewelry; Tourist Photography; Brewster, Sir David; Dancer, John Benjamin; Shadbolt, George; Sidebotham, Joseph; Lenses: 1. 1830s–1850s; Lenses: 2. 1860s–1880s; and Markets, Photographic.

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MIETHE, ADOLF (1862–1927)

German photo-physicist and photographic writer

Adolf Miethe, born Adolf Christian Heinrich Emil Miethe in Potsdam on 25 April 1862 to city councillor and chocolate factory owner Albert Miethe and his wife Karoline, studied physics, astronomy and chemistry in Berlin and Göttingen. He had worked as an assistant at Potsdam's astro-physical observatory and in 1887, with the help of Johannes Gaedicke, invented the first widely used magnesium flash powder. After gaining his doctorate in astro-photography, Miethe was employed as a scientific collaborator by several optical firms in Potsdam, Rathenow, and Brunswick, in the latter as a director of the company Voigtländer & sons. In 1899 he was appointed successor to Hermann Wilhelm Vogel in the chair of photo-chemistry, photography and spectral analysis at the Technische Hochschule [Institute for Technology] Charlottenburg, Berlin where he expanded the photo-chemical laboratory and founded an observatory. During his lifetime Miethe undertook several expeditions, amongst others to Egypt and Norway, before he died in Berlin on 5 May 1927. He edited and contributed to several photographic journals, like Das Atelier des Photographen [Photographer's Studio] and Photographische Chronik [Photographic Chronicle] and wrote several treatises for amateur and professional photographers alike. Miethe designed several new microscope and camera lenses, including a telephoto lens, and he was much occupied with enhancements of astronomical photography, color photography and emulsion sensivity to spectral light.

STEFANIE KLAMM

MIGURSKI, KAROL JOSEF (active 1850s–1870s)

Professional photographer

Josef Migurski, a native of Poland, became interested in photography in 1850s. He owned a photographic studio in Odessa. He was also the author of the first photographic instruction manual in the Russian language, entitled *The Practical Guidance on Photography* where the descriptions of the equipment and formulas of chemical solutions were given. It also included advice on various types of photography, for example studio portraits, architectural, and landscape photography. Migurski popularized photography through this. In 1863 he lectured on the technology of the photographic processes in the Richelieu lyceum in Odessa. In the "Novorossiysk calendar of 1864" Migurski placed an announcement devoted to the photographic institute which he established. There, one could study the theory and practice of photography.

Migurski was the author of the albums *The views of the town Akkerman* (1869) and *The album of the Odessa's port works* (1869). Migurski also extensively photographed Odessa. Apart from creating city views, he also made genre scenes, for example photographs showing building works and diving works in Odessa's port.

Also notable, Migurski won the Great Silver Medal in 1872, at the Polytechnic Exhibition in Moscow. Additionally, he was a military photographer of the Russian troops' General Staff during the Russian-Turkish war of 1877–1878.

ALEXEI LOGINOV

MILITARY PHOTOGRAPHY

Apart from the portrayal of the aftermath of war and limited use on the battlefield, photography was adopted by the military in the nineteenth century to serve the causes of advancing nations of Europe and the United States. The early history of the military's use of the camera is inextricably bound to survey work in domestic and foreign exploits, including various engineering projects such as the construction of bridges and railroads, and the exploration of politically sensitive regions. This essay is not about the photography of war, but the deployment of the medium by army personnel and civilians acting on behalf of political authority or nationalist concerns who understood how photography could function outside the portrayal of conflict. In 1860, Captain Henry

Schaw, Chief Instructor of the Telegraph and Photograph School, offered a ten-point list for photography, including the recognition of borders and landmarks in remote areas, the reproduction and distribution of plans and maps, the documentation of military maneuvers and the apparatus of warfare, the depiction of "remarkable persons and costumes of foreigners, and the general picturing of building, bridges, and other structures" (Howe 2003, 231). Although these endeavors were not always directly connected with warfare, they could scarcely be called neutral in terms of ideological meaning. Even an army's contribution to public works was politically motivated by government authorities concerned with the administration and control of their domains.

Already by the mid-1850s, a close alliance existed between military trained and civilian operators in their mutual concern for applying the medium to documentary enterprises of potentially strategic significance. Roger Fenton's pictures of encampments and ships in harbor in the Crimea of 1855 and Gustave Le Gray's depictions of military exercises at Camps de Châlons of 1857 provide early indications that independent practitioners known for landscape and other genres might work in support of nationalist causes. John McCosh, surgeon in the employ of East India Company's infantry produced landscape and architectural views while engaged in at least two tours of duty, the Second Sikh War (1848–49), and the Second Burmese War (1852). His realization of the significance of the camera for multiple subjects led him to include a section on photography in his Advice to Officers in India, published in 1856. McCosh's conviction of the medium's importance coincided with the flourishing of other efforts on the subcontinent and elsewhere. In addition to McCosh's fellow doctor John Murray, British army officers Captain Thomas Biggs, Captain Linnaeus Tripe, Major Robert Tytler, and his wife Harriet Christina, were enchanted with India's splendid architectural past, and thus contributed to a growing archive that increased throughout the second half of the century. The photographic societies of the three Presidencies of Bengal, Bombay, and Madras in the late 1850s counted in their membership military personnel together with civilian amateurs and commercial practitioners who were also concerned with the preservation of antiquities and peoples of the subcontinent. Photographers like Felice Beato and Lala Deen Dayal attached themselves to military operations, Beato first in the aftermath of the Indian Rebellion of 1857, and Deen Dayal in the 1870s with the British military elite. As a native Indian, Deen Dayal was unique in his ability to straddle "princely India" and Anglo-India by working under the patronage of the wealthy sixth nizam of Hyderabad and of the British Raj, recording palaces and royalty, as well as landscape views, military maneuvers, and artillery.

The example of India underscores the considerable alignment of European military and civil authority in world affairs. Photography has frequently been characterized as an emblem of conquest and territorial appropriation; witness Eugène Durieu's report to the French Photographic Society, "that photography would conquer unknown territories as the victorious armies of France conquered land" (Marien 2002, 86). Major Charles Callwell used the term "small wars" to characterize conflicts which "dog the footsteps of the pioneer of civilization in regions far off" (Ryan 1997, 73). Callwell's observations are not exclusive to war per se, but engage an ideology of "extended empire," which can be perceived as symbolically reinforced by the production of photographs as apparently benign as a landscape or an architectural view. Early photographs of the Himalayas by Deputy Commissioner Philip Henry Edgerton function as illustrations of a remote area that could well figure into the development of a trade route into Central Asia. Though Egerton's one-time journey through Spiti was in no way clandestine, his explorations represent a gathering of intelligence fostered by competition with Russia, as evident in his published photo-illustrated account (1863). The commercial photographer John Burke extensively covered Britain's penetration into Afghanistan from the North-West Province of India during the Second Afghan War (1878–80). Like Egerton's, Burke's pictures more than suggest associations with the "Great Game," the contest of territory between Britain and Russia often covertly fought in the mountainous regions of Afghanistan, India, Tibet, China, and Russia, and made popular by the operations of Rudyard Kipling's fictional character Kim.

The Royal Engineers' school at Chatham began to teach photography in 1856. The Engineers were involved in numerous surveys of strategic military importance around the world. The mission of the Abyssinia Campaign of 1867–68 was to rescue several Europeans held captive by Theodore (Tewodros II), Emperor of Abyssinia. The expedition's leader, General Sir Robert Napier of the Royal Engineers, made sure to document the scene of the army's exploits; the powerful Sir Roderick Murchison of the Royal Geographical Society had sanctioned the entire project in the cause of empire. The Sinai Peninsula, a politically sensitive region that loomed large in the cultural imagination for its biblical associations, gained the attentions of both the British and the French in the latter half of the century. The great rivalry between these two powers, trailing back to Napoleonic France, is seen in the controversy over Egypt and the Sinai region. The Ordnance Survey of the Peninsula of Sinai was launched collaboratively in 1868 by private agency and the War Department, which administered the Royal Engineers. The expedition's objective was to map the area for both scientific and scholarly reasons. The

Engineers' Sergeant James MacDonald took at least 300 pictures of geographical and ethnographic interest. The construction of the Suez Canal was underway during the survey, and it is hard not to imagine MacDonald's record and the survey report of value in Britain's political designs to dominant the seas and global transport (Howe 2003, 237). Activity in the Middle East was not limited to Europeans: Egyptian Colonel Muhammad Sadiq (or Sadic Bey), skilled in photography, explored Arabia around 1880 with the intent to map the vast terrain. Sadiq did not use the camera an official capacity, but photographed places that would not ordinarily welcome western investigation, most notably the holy city of Medina (Madinah).

The Great Surveys of the American West following the Civil War reflect a similar correspondence—even tension—between military and civil patronage and the meaning of photographs. The case of Timothy O'Sullivan's work for three different expeditions following his employment with Mathew Brady and Alexander Gardner during the Civil War is particularly instructive. The War Department in association with the army's Chief of Engineers was a major sponsor of Clarence King's U.S. Geological Exploration of the Fortieth Parallel, for which he hired the experienced O'Sullivan. This was a matter of expediency on King's part in order to gain the support of Washington. His work was an essentially civilian enterprise, albeit with the Union's strategic interests at stake; the government would see the value of King's reports from the vantage point of economic prosperity and potential settlement in along the transcontinental railway. The U.S. Army tended to see itself traditionally in the leadership role of explorations of the western territories. Thus Brigadier General Andrew A Humphreys, the Chief of Engineers who backed George Montague Wheeler's U.S. Geographic Surveys West of the One Hundredth Meridian, looked at the civilian surveys of Powell and Hayden, as "bureaucratic rivals." How this actually plays out in the photography and reports of the Great Surveys reveals a fascination with the desert and arid mountainous regions of the Great Basin, from geological features to artifacts of the vanishing tribes. The displacement of Native Americans must be considered in any consideration of western expansion and enterprises like King's or Wheeler's. Documentation of the current hostilities between the US and the Indian nations was relatively limited in contrast to the preoccupation with their heritage and remains, as seen in O'Sullivan's picturing of the cliff dwellings in the Cañon de Chelle, New Mexico, for the Wheeler survey in 1873. O'Sullivan worked as well for the 1870 season in the Isthmus of Darién (Panama) under Lieutenant-Commander Thomas O'Selfridge of the U.S. Navy. From a military standpoint, mapping and identifying areas through photographic reconnoitering, as in the instance of Panama in preparation for the proposed canal, proved useful for the future security of U.S. interests.

Photographs related to military reconnaissance and exploration or civil operations with military associations contributed to an archive that would assist in ordering a world which, in the previous century, remained only partially comprehended. Set within the context of institutional reports, collections, exhibitions, and popular printed formats such as the stereograph and the wood engraving, photographs were instrumental in serving to engender a geographical identity for regions under industrial development or surveillance. The process of identification and recognition of subjects, repeated through the dissemination of photographic reproductions, played to imaginative conceits of the observer. Documentary photographs could not function outside of the symbolic and the utilitarian basis of their production, for which there were ideological assumptions underlying the original objectives of expeditionary and military enterprises. Such ventures yielding a photographic record circulated in the public domain had a galvanizing role in the "civilizing mission" of the west by reinforcing the power and presence of modern industrial nations throughout the world.

GARY D SAMPSON

See also: Biggs, Colonel Thomas; Burke, John; Durieu, Jean-Louis-Marie-Eugène; Egerton, Philp H.; Fenton, Roger; Le Gray, Gustave; McCosh, John; O'Sullivan, Timothy Henry; Tripe, Linnaeus; Tytler, Harriet and Robert C.; Documentary; Expedition Photography; Landscape; Mountain Photography; Panoramic Photography; Science; Survey Photography; and War Photography.

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MIOT, PAUL-EMILE (1827–1900)

French photographer and hydrographer

The French photographer and naval officer Paul-Emile Miot produced some of the earliest known photographs of the east coast of Canada and Newfoundland. His photographs present a remarkable early picture of this coastline and its peoples, particularly because a career naval officer took them during official missions, and without compromising his successful naval career. But more importantly, his use of photography as an aid to the work of the mapmaker is an important application of the medium, and one which is still used extensively today.

Miot was born in Trinidad to a French father and a West Indian mother, and the family returned to Paris while he was still quite young. Intent on a career at sea, he entered the Naval Academy in Paris in 1843, and emerged in 1849 with the rank of sub-Lieutenant.

He first served on the *Sibylle*, being given the command of the merchant ship *Ceres* in 1849, and survived an epidemic of yellow fever which killed two thirds of his crew. From the autumn of 1855, until hostilities ceased in the spring of the following year, he served as an officer with the French naval fleet based at Kamiesch during the Crimean War

There exists in the archives of the Bibliotheque nationale a remarkable series of photographs of the French fleet taken at Kamiesch by Jean-Baptiste-Henri Durand-Brager and Pierre Lassimonne, dating for the period of Miot's service there, and some researchers have suggested, as yet without corroboration, that Miot's interest in photography may date from that time and a possible encounter with those two photographers. He started to experiment with the camera early the following year while on leave from the navy.

It is also suggested by several sources, that during that same commission, Miot, still a sub lieutenant, met Lieutenant (and later Admiral) Georges-Charles Cloué, who would play a pivotal role in the development of his naval career thereafter.

By the following year, 1857, Miot was demonstrating his photographic accomplishments, sailing with Cloué for the first time, and now promoted to full lieutenant. That voyage, to Newfoundland on board the *Ardent* resulted in his earliest known photographs, which were met with some acclaim back in Paris, and used as the basis for line illustrations in *le Monde Illustré*.

In a letter preserved in Archives nationals in Paris, dated September 27, 1857, Cloué describes the importance of Miot's photography in assisting with their hydrographic and mapping mission.

> One of the officers of the *Arden*t , Lieutenant Miot, took up photography during his last period of leave. He is remarkably successful, Commodore, as you have been able to see for yourself. I have given some thought to utilizing this new science, which, until now, might have appeared to have no more than an artistic value, for our precision work, and I believe that, thanks to the ability and the intelligence of Mr. Miot, I have achieved results that give extremely high hopes for the future.
>
> Theodolite readings taken from the main points of triangulation require a certain experience of drawing to produce the views, which, with the aid of the angles that are included in them, are invaluable in later recreating the contours of the coast and the main features of the terrain.
>
> Henceforth, a few angles taken with the theodolite will suffice, and the readings will be complemented by a photographic view on which the angles need not be calculated until the moment when the map is drawn. I have had Mr. Miot take several of these views, taking care that the focal point of the instrument's lens is in the same position for each of the views, so that the horizontal distances on the print always represent the same number of degrees in the angle.
>
> When taking measurements from the photographic views, with a graduated metal ruler, of the distances that separate the verticals drawn from various readings, I have frequently obtained accuracy to within one minute compared to the angles provided by theodolite readings.

Miot had taken his own camera and equipment on the voyage, although Cloué did arrange for a 'small, suitably-equipped photographic laboratory' to be established for him onboard the *Ardent.* It is clear that Cloué saw this work as a partnership between Miot and himself—photographer and chart maker—admitting to have no photographic knowledge himself, and to be entirely dependant upon Miot's expertise.

Further voyages to Newfoundland saw Miot's photographic productions as more and more closely integrated with the survey itself—but not exclusively so—and by 1860 he and his work had achieved official recognition, with photographic facilities established at the Dépot des cartes et plans. When the *Ardent* got trapped in ice, Miot carried his camera on to the ice-flow, and produced some magnificent studies that rival the best Arctic pictures of the nineteenth century. During stopovers in the French islands of Saint-Pierre-et-Michelon (today

the last remaining fragment of the French Empire) off the coast of Newfoundland, he also became the first person to take photographs of the islands inhabitants and their villages.

Photographs from the Newfoundland expedition were printed for Miot by Furne et Tournier of Paris, and the decision to hand the negatives over to a commercial printing house suggests that they were produced in quite large numbers. Others were used as the basis of engravings for *Le Tour du Monde* over a period of months in 1863, a part-work published intermittently until the mid 1870s.

By 1863 he had his first naval command, and almost four years later completed a tour of duty which had taken him to Mexico and Martinique. The period from 1868 to 1871, now promoted as Admiral Cloué's Chief of Staff, saw him circumnavigate South America, along the way visiting the Marquesas Islands, where he produced accomplished group portraits of the Royal Family of Vahitou.

The deands of a blossoming naval career seem to have limited Miot's time for photography, the majority of surviving images covering the period 1858-1875. By 1881 he had reached the rank of Rear-Admiral, and Vice-Admiral by 1888. By then he was deskbound in Paris, retiring from the navy at the age of sixty-five.

A substantial number of his glass plate negatives survive in the archives of the Ministére de la marine in Vincennes, France.

JOHN HANNAVY

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MISONNE, LÉONARD (1870–1943)

Known as one of the most important Belgium photographers of his time, Léonard Misonne was born in 1870 in Gilly, Belgium. After being introduced to photography in 1891 during his engineering studies in Louvain, he joined the Photo-Club of the city and decided to give time to arts—painting, music, and photography.

As he became a member of the Association belge de photographie, he took part of his first exhibition in 1896 with pictures of the country and the peasant life in a style he developed until his death in the pictorialist aesthetic. From this time he never gave up exhibitions especially in Paris, New York, London, Germany, and Austria, which gave him international acknowledgement.

He obtained the visual effects and atmosphere thanks to the different processes he used. In a first period, he printed his photographs on carbon however between 1900 and 1910 he used Fresson paper and then oil print he learned from Constant Puyo.

MARION PERCEVAL

MISSION HÉLIOGRAPHIQUE

In 1851 the *Commission des Monuments historiques*, part of the French Ministry of the Interior, sent photographers on five missions to different regions of France to make records of historic monuments which were being restored or were slated for restoration. The buildings in question were primarily examples of medieval ecclesiastical architecture, but Renaissance palaces, Gallo-Roman structures, and some pre-historic stone groupings were included. The Mission héliographique, as the project has come to be called, is one of the first instances of photography conceived and commissioned by a government agency for archival purposes. In 1851 it also constituted one of the largest photographic projects ever undertaken. The photographers involved include several great figures in the history of photography: Henri Le Secq, Edouard Baldus, Hippolyte Bayard, Gustave Le Gray and Auguste Mestral. Le Secq was sent north-east to Champagne, Lorraine and Alsace. Baldus was dispatched to Provence by way of Fontainebleau, Burgundy, and the Dauphiné. Bayard was assigned Normandy. Le Gray and Mestral were directed to the center and south-west, and undertook their missions together: they began in the Loire Valley, circled down into Languedoc, and returned through Auvergne. Each photographer was provided with a list of monuments to record; parts of buildings and even works of art were often specified on the lists.

Le Secq used Le Gray's waxed paper negative process and produced between 150 and 200 negatives, although the commission acquired a set of only 96 negatives and prints. Baldus worked with albumenized paper negatives and made 46 negatives and prints (some of his finished negatives combine multiple spliced views). Le Gray and Mestral used waxed paper negatives and contributed 120 negatives and prints. Bayard employed glass negatives with Niépce de Saint Victor's albumen process. Although Bayard's photographs were discussed in the press, it is unclear whether he ever turned them over to the Commission: only a handful of prints identified as part of his mission now exist. The other photographers' negatives (which number close to 300 with duplicates and panoramas) are housed at the Musée d'Orsay. 165 of the prints survive from the original set, and most of these are divided between the Musée des Monuments français and the Photothèque du Patrimoine in Paris.

There is some evidence that the photographers were selected out of a competition (such a contest is indicated in an 1853 letter written by a student of Baldus).

However all five photographers were members of the newly-founded Société héliographique, and several other members of that Society were government functionaries with some connection to the Commission des Monuments historiques, notably Léon de Laborde, who was a member of both bodies. Thus it appears that the Société héliographique was somehow involved in developing or at least encouraging the photographic missions. But the Society and the Commission had different objectives. The Commission devised the survey to document structures that were slated for government-sponsored restoration, so the buildings chosen were not necessarily the chief monuments of their respective cities. Moreover a number of the photographs, such as "Dolmen de Bagneux près Saumur" by Le Gray and Mestral, seem to reflect the particular enthusiasms of Prosper Mérimée, director of the Commission, more than any institutional imperative. Most of the regions of France are included in the survey, indicating some interest in a representative collection of views. But the Commission acquired only certain views made by the photographers: Le Secq, Le Gray and Mestral all made many more photographs than requested on their trips, but the extra work did not interest the Commission. Much of Le Secq's work has survived; it is comprised almost entirely of building views, and yet the Commission acquired only a portion, for instance, of the 43 photographs he made of Strasbourg Cathedral (his work not purchased by the commission is now housed at the Bibliothèque des Arts décoratifs in Paris). A photographic record for its own sake was outside the Commission's purview. The negatives and prints it acquired were filed in dossiers on the respective buildings they represented. The Commission never published or exhibited the photographs.

Such a photographic archive did not match the interests of the Société héliographique. The group's objectives were indicated as early as March 1851, when *La Lumière* reported that the photographic missions had given impetus to the Society's desire to found a photographic publishing establishment. Evidently the members envisioned printing views from the project for public dispersal. The scope of the Society's hopes for the missions is indicated by Francis Wey's 1853 reference to the projcet in his essay "Comment le soleil est devenu peintre:"

> …The public is deprived of these prints that everyone would examine and discuss; the photographers are denied the publicity they had hoped for, and our country cannot honor the most beautiful body of work that has been produced to date. We had asked for as much and we had hoped for more.

The photographs were in fact widely discussed in the photographic press, where the distinctive approaches of the photographers were noted. Baldus combined negatives with amazing skill in several views, such as "Palais des Papes et Notre-Dame-des-Doms" taken in Avignon. In this and other images he typically depicted his subject from a distance, with the entire structure placed centrally in the frame, giving it an air of monumentality. Le Secq's heroics were not on the order of combined negatives or monumental views, but in climbing all over and around a building to capture perspectives of rarely-seen details. In views such as "Cathédrale, flèche, angle nord-est" taken at Strasbourg, he combined his rooftop escapades with dynamic off-center compositions that often vivify the sculpted figures. Le Gray and Mestral frequently emphasized the graphic patterning of darks and lights in the picture frame, making imaginative use of the calotype's blank skies. Their compositions give the subjects a sense of grand scale and architectural harmony, as seen in the view "Eglise, ensemble est" taken at the church of Saint-Julien-de-Brioude. Despite these creative prerogatives, the various processes the photographers used all point to a desire for smooth negative surfaces and optimal clarity, an obvious requirement for architectural records. The fact that only Bayard employed glass is not surprising: transport of the negatives was precarious, and Niépce's process was very slow with uneven results. Along with the Mission photographs themselves, Baldus' subsequent production of finely detailed calotype views points to the desire of these photographers to make good architectural documents with the calotype process.

However hidden from view the Mission photographs remained, they were part of a wide impulse to document France's architectural heritage. Baron Taylor's *Voyages Pittoresques* is frequently cited as a lithographic model for the Mission héliographique, but the specific archival requirements fulfilled by the Mission mark its difference from Taylor's Romantic atlas. The use of photography for such a project was untested in 1851, but it was not without precedent. The *Commission des Monuments historiques* had itself ordered six "daguerreotype views" of unspecified subjects from Bayard in 1849. As early as 1843 the architect Felix Duban had hired Bayard to make between 20 and 50 daguerreotypes of the château at Blois for a restoration ordered by the Commission (a handful of these are preserved at the Société française de photographie). Closer to the sentiments of the *Voyages Pittoresques*, Le Secq had privately undertaken a photographic record of Amiens Cathedral in 1850. These endeavors and the Mission itself demonstrated that photography could serve both the public's imaginative relationship to the past and the instrumental needs of architects and committees. Throughout the 1850s photographers continued to record monuments all over France. In 1852 Charles Nègre embarked on a photographic tour of his native Provence, photographing

many of the same monuments Baldus had recorded, with publication of a de luxe album in view. That same year Le Secq began returning to the great Cathedral towns of Chartres, Amiens, Reims, and Strasbourg. His motivations seem personal, but some of his views found their way into the albums of Louis-Desiré Blanquart-Evrard, which were marketed to a broad art-world milieu. Baldus' mission launched his commercial career: he went on to photograph old and new monuments for the government, the railroad companies, and for his own trade in views. His work, and that of Charles Marville a bit later, continued to fill the archives of city and state. But both photographers retained their negatives, a lesson they had perhaps learned from the fate of this first photographic mission.

PETER BARBERIE

See also: Marville, Charles; Blanquart-Evrard, Louis-Désiré; Nègre, Charles; Société française de photographie; Wey, Francis; Niépce de Saint-Victor, Claude Félix Abel; Mestral, Auguste; Le Gray, Gustave; Bayard, Hippolyte; Baldus, Édouard; Société héliographique; and Le Secq, Henri.

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MOFFAT, JOHN (1819–1894)

One of the most widely reproduced portraits of William Henry Fox Talbot was taken in 1864 by the Edinburgh photographer John Moffat. That same year he gave the first public demonstration in Scotland of photography by the light of burning magnesium wire.

Born in Aberdeen on 26 August 1819, the son of a successful bookbinder, John Moffat moved to Edinburgh with his parents in 1827. Trained as an artist and engraver, he owned his own engraving business in Edinburgh by 1848. As an amateur photographer, examples of his work were shown at the 1851 Great Exhibition in London, and opened his first portrait studio in Edinburgh's Nicholson Square in 1853. In 1857 he opened the first of five studios on Princes Street. The studio occupied premises at 125/126 Princes Street until 1962. Throughout his professional career, Moffat combined his interests in art and photography, operating an art gallery on the first floor of his Princes Street premises, selling oils and watercolours by the leading artists of the day.

He was a leading figure in the Photographic Society of Scotland from its inception in 1856 until it ceased to function in 1873, and in the Edinburgh Photographic Society from 1863 until his death, serving as its President for many years.

Moffat's obituary was carried by the British Journal of Photography.

JOHN HANNAVY

MOIGNO, ABBÉ FRANÇOIS (1804–1884)

French religious teacher, author, nicknamed "the Apostle of Projection"

Born in 1804, Moigno entered the Society of Jesus in 1822, leaving in 1844 to become a high school chaplain. In 1850 he introduced David Brewster to Duboscq, who then constructed Brewster-pattern stereoscopes. Moigno established 'Le Cosmos,' a popular science magazine, in 1852. His visit to the Royal Polytechnic in London in 1854 fueled a lifelong enthusiasm for image projection. Moigno's initial attempts to present lectures illustrated by slide projection were forbidden by the authorities, but he persevered. In 1864 he gave presentations of photographic slides in temporary venues, and after a difficult start, his more permanent Salle de Progrès, set up in Paris in 1872, was a success. Moigno's 1872 book 'L'Art des Projections' was the first French magic lantern manual. His 1882 catalogue of photographic slides—many by professional photographer Armand Billon—comprised over 4,000 items featuring Geography, History, Biology, and other topics. Photography itself was one subject, with microscopic photographs, portraits of Niépce and Daguerre, and photographs of equipment. Moigno's later claim to have originated educational teaching by slide projection was overstated, but he was certainly a major proponent of the method for decades. He died in 1884.

STEPHEN HERBERT

MONPILLARD, FERNAND 1865–1937
French photomicrographer

Fernand Monpillard quickly acquired a reputation as an exceptional photomicrographer. His "Laboratory of Microphotography" was located at 22, Saint-Marcel boulevard in Paris, not far from the national Museum of natural history. He collaborated with many naturalists, biologists, and mineralogists whose articles were often illustrated with his work. At the end of 1870, photography acheived a scientific quality that Monpillard never failed meet. Becoming a member of Société française de photographie (SFP) in 1892, he frequently shared his research on plates with orthochromatic emulsion, which caused the indirect reproduction of colors or trichromatic synthesis. With the development of the histology and microbiology, the microscopic observations required color and Monpillard worked to obtain images that would further the succes of scientific investigations.

If he worked to integrate photomicrography into the experimental protocol, he also contributed to the history of color photography. Auguste and Louis Lumière profited from his research on coloured screens as they used them for their autochrome plates. From 1908 to 1932, during the evening he gave projection shows of his autochrome plates there that were used for scientific and geographical applications at the SFP. Monpillard published his first treatise of photomicrography in 1899 (*Microphotography*, Paris, Gauthier-Villars) according to his technical courses given t the SFP, and then another in 1926 (*Macrophotography and microphotography*, Paris, Gaston Doin and Co). He was also the director of the luxurious review *La Photographie Française* from 1901 to 1905.

Carole Troufléau

MONTFORT, BENITO DE
(active 1850s)
French aristocrat and benefactor

Writing in the journal *The Chemist* in February 1852, in an article entitled 'Photography in France', Roger Fenton described his visit to the Paris home, at 15 Rue de l'Arcade, of Colonel Benito de Montfort, son of Baron de Montfort, and the founder of the Société heliographique, the world's first photographic society. The society's rooms were in de Montfort's house in one of Paris's most desirable and elegant neighborhoods near the Bourse.

> An entire suite of apartments, consisting of four or five rooms, at the top of the house, of course, and opening on to an extensive terrace, with an excellent light, is devoted to the purposes of the society. One room is entirely occupied, walls, drawers and cupboards, with choice specimens of the art, mostly in metal; another is fitted up with a laboratory, one corner of which is an enclosure surrounded with yellow curtains, to exclude the light. In fact there is every requisite facility, both for receiving the amateurs in a suitable locale, and for their trying experimentally, any new development of the science.

Such facilities attested to Montfort's enthusiasm for the new society which had been set up in 1851 as a meeting point for a number of eminent scholars and men of science, who were interested in the new art of photography. Despite Fenton's comment that most of the images he saw were daguerreotypes, the forty founding members included many who were producing work of the highest quality with the several negative/positive processes of the time—including Baron Gros, Baldus, le Secq, Mestral, le Gray, Lerebours and Vicomte Vigier.

Fenton would later use his knowledge of the French organization as one of the triggers for the foundation of the Photographic Society of London in 1853. So, indeed, would Antoine Claudet, now accepted as the probable author of a handwritten proposal for the formation of the London Society, now in the collection of the national media Museum, Bradford. In that document, the proposal that the new society should have its own rooms (in Claudet's premises) describes a layout remarkably similar to the suite of rooms Montfort had made available to the Société heliographique.

Many of Benito de Montfort's ideas for the Société heliographique were far-sighted and inspirational. The organisation would collect exemplary works, would publish an *Album* of the finest paper photography, and would publish a journal—*la Lumière* initially edited by F A Renard, then by the Jesuit Abbé François Moigno and later by Ernest Lacan—in which all the latest advances and ideas were circulated to members, and which was available on subscription to non-members. The editorial offices of *la Lumière* were also in Montfort's house. Interestingly, Abbé Moigno went on to edit *Cosmos*, also founded by Montfort in 1852, initially as a scientific journal, but later with considerable interests in photography as well.

The first *Album* was produced in spring of 1851, the cost of binding it being met by Montfort—described by le Gray as Comte de Montfort—out of his own pocket. While *la Lumière* prospered and continued in regular publication until 1867, the Société heliographique ceased to function after only two years, to be replaced in 1854 by the Société française de photographie, which published its own journal, the *Bulletin*.

Two further albums were produced in 1852 and 1853, and despite the society's rules stating that in the event of it being wound up, the albums were to be given to the Bibliothèque nationale (then the Bibliothèque royale)

and the library being advised of the imminent gift in March 1853, there remains no trace of them.

Montfort served for a time as the Societé heliographique's first President, before being replaced by Baron Gros, and for its entire existence, the society continued to enjoy premises within Montfort's house. Remarkably, little is known of Benito de Montfort private or public life, and of his practical involvement with photography, nothing. However, in his day, as one of French photography's earliest benefactors, he was renowned for his generosity. His importance in the propagation of the understanding of photography was acknowledged by le Gray in the concluding paragraphs of his introduction to his booklet *Plain Directions for Obtaining Photographic Pictures* in 1852 (English language edition Philadelphia: A. Hart, 1853).

John Hannavy

See also: Baldus, Edouard; Fenton, Roger; le Gray, Gustave; le Secq, Henri; Lacan, Ernest; la Lumière; Mestral, Auguste; Moigno, Abbé François; and Société heliographique.

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MOODIE, GERALDINE (1854–1945)
Canadian photographer

Geraldine Fitzgibbons Moodie was born in Toronto, Canada, on October 31, 1854, to Agnes Dunbar Moodie, an illustrator, and Charles Thomas Fitzgibbon, a lawyer and registrar. In 1870, the family relocated to Ottawa where Geraldine completed her education. She traveled to England in 1877, where she met and married her husband, John Douglas Moodie, who joined the North-West Mounted Police in 1884. The Moodies relocated frequently and lived at every major Mounted Police post in Western Canada, as well as in the Hudson's Bay district of the Eastern Arctic. Geraldine Moodie began to practice photography in the 1890s and she opened her first photographic studio in Battleford in 1895. While much of her photographic activity consisted of customary portrait work, she also photographed the activities of both the Mounted Police and the Native communities that surrounded her. Of particular interest are her photographs of the Inuit people that she encountered in the Arctic. Her interest in botany also led her to photograph plant life. John Moodie retired from the Mounted Police in 1917 and they settled in Maple Creek, later moving to British Columbia and then to Alberta, where Geraldine Moodie died on October 4, 1945.

Andrea Korda

MORAITES, PETROS (c. 1835–1905)

Petros Moraites was born on the island of Tinos in the Aegean Sea. He studied painting in Athens but very soon, fascinated by the new medium, he became involved in photography. In 1859, in collaboration with the Greek photographer Athanasios Kalfas, he opened his first studio located at Ermou Street in Athens. The very same year, the two partners presented photographs at the 1st Olympiad (held in Athens) winning a silver medal for their photographic reproductions of landscapes. In September 1860, the partnership ended and Moraites moved his studio to Aiolou Street. Many important personalities of the Greek society: politicians, intellectuals, ambassadors, actors including members of the royal family, as well as ordinary people, posed before his camera. It is assumed that around 1868, he was appointed photographer to H.M. the King, a title bestowed for the first time on a Greek photographer.

Moraites's depictions have been distinguished for their "precision in execution, purity of line, harmony and perfection, without corrections, of photographic work." He earned many distinctions in various photographic exhibitions in Greece [2nd (1870), 3rd (1875) and 4th (1888) Olympiad held in Athens] and abroad [Weltausstellung 1873 held in Vienna and Exposition Universelle (1878) held in Paris]. After his death, his studio was taken over by his son, Georgios P. Moraites, who was soon afterwards obliged to sell it to Nikolaos Pantzopoulos.

Aliki Tsirgialou

MORAN, JOHN (1831–1903)
American photographer and painter

John Moran, a Philadelphia landscape and cityscape photographer, was born in 1831 in Bolton, England to weavers, Thomas Moran Sr. and Mary Higson Moran. A brother to landscape painters Edward, Peter, and Thomas, an active member of the Photographic Society of Philadelphia, and an early proponent of photography as a fine art, Moran began his career in photography in Philadelphia in 1860. For the next decade, Moran focused on landscape photographs of the region, including notable views of the Wissahickon Valley and Delaware Water Gap in addition to stereographic views of Philadelphia landmarks and estates. In 1865, Moran

delivered his "The Relation of Photography to the Fine Arts" paper to the Photographic Society of Philadelphia for which he later served as the vice-president from 1870 to 1873. In 1870, he sold an album of views of early Philadelphia architecture to the Library Company of Philadelphia. Soon thereafter, Moran acted as official photographer for both T.O. Selfridge's expedition to the Darien Isthmus in Panama (1870–1871) and the United States' observation of the Transit of Venus in Tasmania and South Africa (1874). By the late 1870s, following his display of landscape views at the Centennial Exhibition of 1876, Moran abandoned photography for landscape painting. On February 19, 1903, Moran died of Bright's Disease at the New York City home of his son, Thomas.

ERIKA PIOLA

MORAVIA, CHARLES BARCLAY WOODHAM (c. 1821–1859)

Employed as an executive engineer with the Public Works Department in India in the 1850s, Moravia was given responsibility for the demolition of buildings in Delhi after the Mutiny. All his known photographic work appears to date from around this period, during which he produced an outstanding range of views of Indian architecture around Delhi, which survive in the form of albumen prints from his paper negatives, generally signed 'Ch. Moravia' and dated in the negative. In 1859 Moravia was appointed Principal of the Engineering School at Lahore, but his career was cut short by his death from smallpox at Sialkot, where he was buried on 30 April 1859.

JOHN FALCONER

MORSE, SAMUEL FINLEY BREESE (1791–1871)

American daguerreotypist, artist, and inventor

Morse, the eldest son of Calvinist Congregationalist minister and geographer Jedidah Morse and Elizabeth Anne Breese, was born 27 April 1791 in Charlestown, Massachusetts. Best remembered as the father of the telegraph, Morse was also known by his contemporaries as the father of American photography, an association often overshadowed by his revolutionary invention. A man blessed with a mechanical mind and cursed with financial instability, Morse pursued photography in the 1840s following a thirty-year career as an artist, inventor, author, and publisher. A recipient of a privileged education at the Phillips Academy (Andover, Massachusetts) and Yale College (Class of 1810), Morse trained for a career as an artist at the Royal Academy in London between 1811 and 1815. Through his foreign study, he developed a nativist ideology that influenced his professional decisions for the rest of his life. Morse would return to America and attempt to create a unified national culture through art and technology.

After Morse returned to the United States, he pursued his artistic career, first through a failed Boston studio and then through itinerant portrait painting. Despite a few prominent commissions in the 1820s, Morse never achieved financial stability. His two colossal paintings, *House of Representatives* (1823) and the *Gallery of the Louvre* (1833), created and exhibited as part of his nativist mission, failed as well. Consequently, Morse sought other outlets to fulfill his intellectual, financial, and professional goals. In 1826, Morse helped to establish and was elected the president of the National Academy of Design in New York. In 1827 he established the periodicals *Journal of Commerce* and *Academics of Art*. In 1832 and 1835, respectively, he was appointed professor of Painting and Sculpture and professor of Literature of the Arts and Design at the University of the City of New York, later New York University. Between 1832 and 1838, with financial and intellectual partners Alfred Vail and Leonard Gail, Morse invented and perfected the telegraph for which he received a patent in 1840. In May 1838, as a Congressional bill to appropriate funds for his invention sat in a political quagmire, Morse traveled to Europe to seek foreign investment.

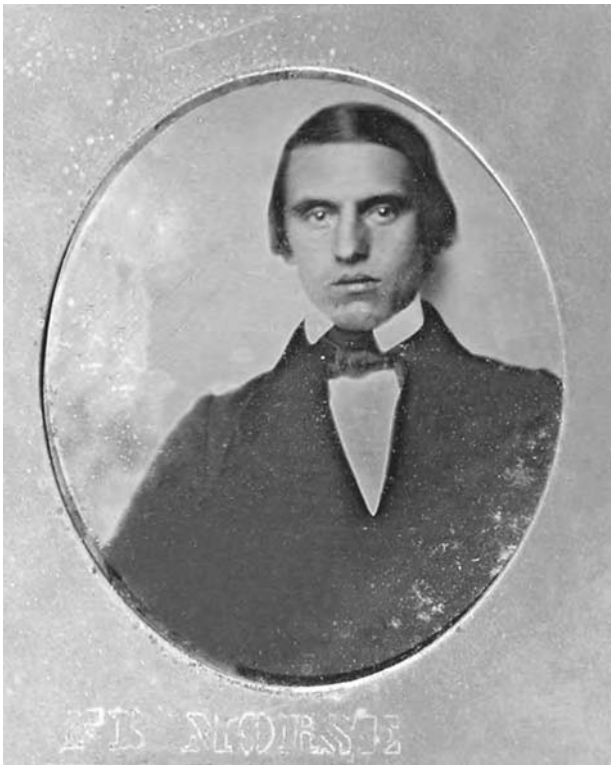
Following its inception in early 1839, the daguerreotype became the one invention that rivaled the telegraph in prestige. On 5 March 1839, during his time in Paris, Morse met with Louis Daguerre and witnessed "one of the most beautiful discoveries of the age." As a trained artist and inventor who had experimented unsuccessfully with photography in the early 1800s, Morse immediately envisioned the cultural impact of this new type of "drawing." In April 1839, Morse authored one of the first American eyewitness accounts of the daguerreotype. Soon thereafter, he became synonymous with the burgeoning field of American photography when his narrative, first published in his brothers' periodical the *New York Observer*, was republished across the country. A month later, he had Daguerre elected as an honorary member of the National Academy of Design and within days of the arrival of the description of the process to the United States in September 1839, Morse became one of the first Americans to announce success in the creation of a daguerreotype.

His daguerreotype view of the new Unitarian Church in New York City was disclosed in the 28 September 1839 edition of the *Journal of Commerce* and in the ensuing months he continued to experiment with the new process aiming to decrease the exposure time of daguerreotypes by several minutes in order to produce portraits. After engaging Daguerre agent Francois Gouraud as an instructor, Morse began keeping detailed

notebooks from January-February 1840, which are preserved in the collections of the Library of Congress, of his lessons and continued experiments with the medium in a glass enclosure on the roof of his university. Through weekly entries, sketches, and charts of carefully inventoried plates, he described his trial and error methods to properly acidize, clean, and iodize the plates, as well as, most importantly, to master the correct exposure time given available light to produce a clear image. By mid-January, Morse had discharged Gourard, whom he felt provided inadequate, outdated instruction and began to more actively collaborate with university colleague, chemist, and daguerreian, John Draper, who had calculated the proper chemical focal measurement needed for successful exposures. Within weeks, through continual trials of variant exposure times using Draper's focal calculation and with equipment designed by George Prosch, Morse overcame his "imperfect" results and produced a superb plate of City Hall in early February. By the fall, his quest to quickly expose focused portraits was finally fulfilled when he perfected a five-lens system developed by Draper. The system of corrected and concave lens allowed Morse to decrease the focal length and exposure time and still produce a distinct image using indirect sunlight. As a result, Morse reported to Draper in November 1840 that he was able to photograph an indoor portrait within five seconds.

During the same period ,Morse and Gouraud started a long public debate about each other's technical abilities and professional qualifications. Morse emerged from the feud perceived as the competent daguerreotypist while Gouraud was seen as the fraud seeking personal fame and fortune. In 1840 and 1841, his reputation unscathed, Morse made one of the earliest group portraits, a view of the Yale reunion class of 1810, and with Draper opened a commercial portrait studio, advertised as the "Palace of the Sun on Broadway," on the roof of the university. By spring 1841, Draper left the studio and Morse opened a second facility on the roof of his brothers' newspaper building.

As he had with portrait painting, Morse pursued portrait daguerreotypes as a means to support his career as an artist. Unlike many of his colleagues, Morse perceived daguerreotypes as "portions of nature herself" that were to be used in place of artists' sketches. As an ally of the medium, he concluded to the National Academy of Design on 24 April 1840 that the daguerreotype was a catalyst for a "revolution of art" that would elevate the artist and the society that viewed his work. Morse believed that daguerreotypes would lead to his long desired national American culture. Given this reputation, Morse quickly became sought after as a mentor for daguerreotypy and from 1840 to 1841 taught such prominent future photographers as Mathew Brady,



Morse, Samuel F. B. Portrait of a Young Man.
The Metropolitan Museum of Art, Gilman Collection, Purchase, W. Bruce and Delaney H. Lundberg Gift, 2005 (2005.100.8) Image © The Metropolitan Museum of Art.

Anthony Southworth, and Samuel Broadbent. By May 1844, following the successful completion of a telegraph line between Baltimore and Washington, D.C., Morse retired as a professional daguerreotypist.

This prophetic artist, however, maintained an association with the field until the end of his life. Daguerreotype portraits of his second wife and daughter from the late 1840s in the collections of the New York Historical Society suggest that he continued to make daguerreotypes as a pastime. From 1851 to1852, he professionally endorsed photographer Levi H. Hill in his quest to be accredited as the inventor of a color photographic process and he judged photography competitions such as the Anthony Prize in 1853. The mid-1850s saw celebrated photographers Mathew Brady and Marcus A. Root requesting Morse's views about his pioneer role in photography. In 1871, he deposited his first camera with Abraham Bogardus, president of the National Photographic Association, which was later acquired by the Smithsonian Institution. According to a July 1871 *Photographic Times* article, he also donated the "first daguerreotypes produced in this country" to Vassar College, of which he was made a trustee in 1865.

After the U.S. Supreme Court upheld Morse's telegraph patent in 1854, Morse's monetary woes ended. Financially secure from the licensing fees of his cel-

ebrated communication device, Morse spent his later years on his estate, Locust Grove, on the Hudson River. On 2 April 1872, the father of American photography, passed away at his home in New York City.

ERIKA PIOLA

Biography

Samuel Finley Breese Morse was born 27 April 1791 in Charleston, Massachusetts. Educated at Phillips Academy in Andover, Yale College, and the Royal Academy, Morse was an artist, inventor, and daguerreotypist who pursued his various professions with a desire to create a national American culture. He opened a Boston art studio in 1815 and a New York art studio in 1823. In 1818, he married his first wife, Lucretia Walker, with whom he had three children, and in 1848, married his second wife and cousin, Sarah Elizabeth Griswold, with whom he had four children. From 1826 to 1832 he organized and was elected president of the National Academy of Design and became an art professor at the University of the City of New York. In 1840, he opened a daguerreotype studio and was granted a patent for the invention of the telegraph. Between 1836 and 1854, he ran unsuccessfully for the offices of New York Mayor and Congressman. In 1854 the Supreme Court upheld his telegraph patent for which he received several national and international honors. Morse spent his later years in Europe and at his estate Locust Grove. He died 2 April 1872 in New York City.

See also: Bogardus, Abraham; Brady, Mathew, Daguerreotype; Draper, John; Daguerre, Louis-Jacques-Mandé; Hill, Levi H., and Southworth, Albert Sands, and Josiah Johnson Hawes.

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MOSCIONI, ROMUALDO (1849–1925)

Italian photographer

From Viterbo, south of Rome, Moscioni had a successful photography business during the albumen period at various addresses in Rome from 1868 onwards. He specialised in topographical views, excavations, early Christian archaeology along with art works, including Etruscan, which will continue to provide historical information for generations to come. In 1889 his business moved to the fashionable Via Condotti which demonstrated his success on becoming the "purveyor to the Imperial museums of Berlin, Petersburg and the Art Museum of Copenhagen." He was in competition with similar material from the larger companies, such as Alinari, Anderson, Brogi. His fourth catalogue, published in 1921, listed 24,900 images (26,000 by the time of his death). Between 1868 and 1895 he had amassed 8,600 negatives. At the turn of the century he was still making, 300+ negatives on average per year but between 1903 and 1921 it rose to 700. Fortunately around 26,000 glass plate negatives, much of his life's work, were divided between the archives of the Vatican Museum, the American Academy in Rome, the Ministry of Education, and the Archivo Forografico Comunale in Rome. Thus Moscioni is one of the few photographers of the period whose large output is so fortunately preserved.

ALISTAIR CRAWFORD

MOTION PHOTOGRAPHY: PRECHRONOPHOTOGRAPHY TO CINEMATOGRAPHY

With the application of photography, the free-flowing images of the artist's *camera obscura* were frozen, and it would be several decades before motion could be recorded and reproduced by the new medium. However, moving images produced from a series of pictures preceded the commercial introduction of photography. In 1832 Belgian scientist Joseph Plateau, investigating the phenomena of Faraday's Wheel, devised the phenakistiscope, a cardboard disc with a sequence of drawings that appeared to move when the images, reflected by a mirror, were viewed through slots in the disc. Viennese Professor Simon Stampfer simultaneously developed his similar Stroboscope. These "philosophical toys" were soon being sold as conversation pieces, and led to the daedelum drum-form version, suggested by English mathematician William George Horner, and marketed from the 1860s as the zoetrope.

The application of photography to moving images was inevitable, but slow exposure times before the 1860s/70s meant that photographing sequences of subjects moving in "real time" was an impossibility. Experimenters compiled sequences from series of static

poses, the subject assuming the key positions of the action being represented.

Since stereoscopic photography was the latest advance, experimenters naturally supposed that moving photographs would be stereoscopic. London-based daguerreotypist Antoine Claudet was intrigued by the idea of stereoscopic phenakistiscopes, but limited his experiments to a two-phase stereogram. Essentially a standard stereoview portrait, each image represented the extremes of a simple staged movement; for example a man putting a cigarette to his lips and removing it. In the viewer a revolving shutter obscured and revealed each picture in turn, one to each eye, resulting in a stereo portrait with a limited motion effect. Similar stereograms were later sold in France.

Other inventors actually constructed photo-phenakistiscopes. French optician Louis Jules Duboscq's was called the Bioscope; one version used twelve sets of stereo halves, left/right images placed one above the other. Subjects—the sole surviving example shows a beam engine—were posed in incremental positions representing a sequence of motion, and brought dimensionally to life in the special viewer.

Englishman William Thomas Shaw patented his Stereotrope in 1860. A series of stereocards was mounted in an octagonal case, incorporating an ingenious drum shutter. In the United States in 1861, Coleman Sellers patented several ideas for stereo-motion viewers including his Kinematoscope, a drum-form tabletop stereoviewer holding six sequential stereograms.

The inventor of the stereoscope, Charles Wheatstone, attempted various stereo motion viewing devices between 1849 and 1870. An existing machine has a strip of images showing a soldier presenting arms.

One rather advanced result was successfully achieved in 1864 by Scottish mechanic James Laing. A conventional stereoscopic plate camera was used to photograph a wooden model village, with cotton-wool smoke rising from a cottage chimney, and a revolving windmill. Frustrated by the zoetrope's limited capacity—"this fixity of number ... does not suit the motoroscopic effect"—the pictures for his successful Motoroscope viewer were arranged on a long continuous belt, one of several ideas suggested by experimenter Peter Desvignes some years earlier. Sadly, no images have survived. This stop-motion animation preceded trick filming by thirty years.

Duboscq produced a projecting phenakistiscope c.1853, while Austrian lanternist Ludwig Leopold Döbler toured with a similar device, built by inventor Franz Freiher von Uchatius. In the 1860s lanternists developed the 'wheel of life' slide—a projection phenakistiscope, with silhouette images arranged on small glass discs—for use with an ordinary optical lantern. Another lantern device, Beale's choreutoscope (1866), comprised a sequence of images on a strip of glass, moved intermittently by a pin-and-cam movement similar to the maltese cross later used in motion picture film machines. None of these projection devices made use of photographs, but static photographic images on glass had been projected by magic lantern from around 1850.

Projection of photographic images shown sufficiently fast to give an appearance of life in motion was achieved by Henry Renno Heyl in Philadelphia in 1870. The photographs, including a repeating sequence of a waltzing couple, were posed individually. Not yet a motion picture of a subject in real-time motion, neverthless successful public Phasmatrope performances were given.

As exposure times decreased and 'instantaneous' photography became possible, attempts were made to photograph sequences taken in 'real time,' with the subject actually in movement—with or without the complications of stereoscopy.

In 1876 English political activist Wordsworth Donisthorpe patented the Kinesigraph camera for multiple glass plates. With the announcement of Edison's newly-invented phonograph Donisthorpe suggested using results from the two instruments together, to screen images of a politician speaking, for instance, but the technology was not sufficiently advanced.

In contrast to those who had a vision of reproducing moving scenes by photography, whom we could call proto-cinematographers, there were also experimenters whose main aim was to obtain a series of images showing phases of motion for purposes of analysis. Initially these chronophotographers had little interest in synthesizing such sequences into a moving picture, but later most would attempt some form of motion synthesis.

Eadweard James Muybridge, an accomplished and well-known photographer, was commissioned to photograph a trotting horse to determine whether it had all four feet off the ground at one time. His single photographs were sufficiently clear to confirm that the horse was indeed 'unsupported' during it's trot and gallop. Muybridge extended his experiments in 1878 to include sequences of animals and humans taken with 12 or more cameras, some of which were stereoscopic. Despite using low-sensitivity wet plates, his results were successful and engravings of his horse sequences widely published, proving of great interest to French physiologist Etienne Jules Marey.

Marey had been analysing human, animal and bird movement using mechanical devices attached to the subjects, connected to an instrument that drew traces on a revolving drum. Muybridge's photo sequences were important in confirming results obtained by Marey's traces, and the physiologist asked the photographer to try sequences of birds. Muybridge's success was limited, so Marey devised a photographic gun for shooting twelve photographs on a glass disc. Though small and lacking detail, the images were useful for Marey's research

on flight. Marey continued with chronophotography, devising large single-lens cameras using wheels or discs with images set around the periphery. Individual images often overlapped, enabling a larger number to be recorded. Overlapping was not of consequence for analytical purposes, and Marey was not concerned with producing motion pictures.

The interest in Muybridge's work continued. To 1870s eyes the frozen positions of the horses' limbs had seemed ludicrous. Muybridge placed the sequences in a zoetrope to synthesise the movement, which appeared perfectly natural, confirming the veracity of each component photograph. The zoetrope being limited to a small audience, he devised a projecting phenakistiscope or Zoogyroscope (later Zoopraxiscope), to present sequences in motion on a large screen. The large glass discs featured painted silhouettes based closely on his sequence photographs. The Zoopraxiscope horizontally compressed the shape of each image on projection, so the painted images were elongated to compensate. Some discs featured a composite scene based on several sequences, such as a bull chasing a man, and a few included elements that were pure imagination. Muybridge now bridged both camps: those content to simply analyze a strip of sequential images, and others trying to invent a motion picture process. In the 1880s he lectured in Europe and the USA, projecting slides of his individual photographs alternately with animated silhouette sequences, generating widespread interest in moving pictures. In 1884 Muybridge was contracted to continue his work, at the University of Pennsylvania. His sequences included zoo animals, nude studies of women, and male athletes. Taken on dry plates, they included more detail than his earlier attempts.

Meanwhile in Germany in 1884, Ottomar Anschütz—who had designed shutters for instantaneous photography—started chronophotographic experiments, with 12 and then 24 cameras. His images, taken on fast dry plates, were of high quality. Like Muybridge, Anschütz became interested in animating sequences of athletes and animals. His zoetrope introduced an ingenious arrangement of three rows of slots of different numbers, for viewing strips with differing numbers of images, essential when photographing animals moving at different speeds. Anschütz's other viewing devices included a large wheel with images rear-illuminated by a synchronised electrical flash lamp.

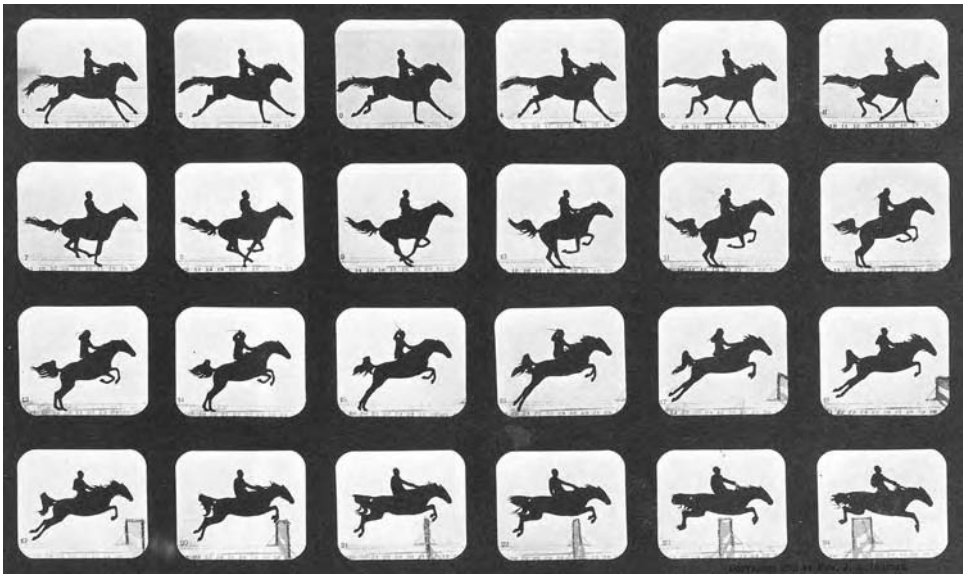
By 1888 Marey was using sensitized paper strips for his photographic analysis. Other inventors, with a vision of cinema, recognised the need for such a flexible medium. Their cameras mosly used some form of intermittent movement, the film being stationary as each frame was exposed. In 1888 Louis Aimée Augustin Le Prince, a Frenchman working in England, was perhaps the first of these visionaries to successfully photograph sequences on paper 'film': traffic on Leeds bridge, his son playing the melodion, and the family in their garden. The images were transferred to belts of glass slides for projection. Several projector designs failed to produce an exploitable result, and Le Prince got into debt. On a visit to France he disappeared, an apparent suicide.

With the availability of rollfilm, Donisthorpe restarted his motion picture experiments, involving draughtsman William Carr Crofts. Their 1889 camera, designed for paper rolls but later using celluloid, featured a unique optical compensation mechanism. Although taken at a slow rate, a camera test of London's Trafalgar Square seemed promising, but unperforated film made projection difficult and success eluded them.

Portrait photographer William Friese-Greene became interested in motion photography through his friend James Arthur Roebuck Rudge, whose magic lantern shows had included simple devices for animated movement. Friese-Greene demonstrated one of Rudge's lanterns, and then developed with engineer Mortimer Evans a camera for taking sequences on a flexible support—initially paper, later celluloid. At around five pictures per second the results were limited, and there was no successful method of motion projection. Their 1889 patent included pins on the drive roller to improve traction. A film of King's Road Chelsea (c. 5 fps) can today be manipulated into a proto-motion picture. In 1893 Friese-Greene patented a stereoscopic sequence camera devised by Frederick Varley, but again the framerate was slow.

These film pioneers found successful projection elusive, but the earlier chronophotographers had by the early '90s developed techniques for commercial exploitation in peepshow machines, using very short photo sequences in motion. An arcade version of Anschütz's "Electrical Wonder" machine, with images set around the periphery of a disc, was produced in quantity, and appeared at the Columbian Exposition, Chicago, in 1893.

Marey's assistant, gymnastics specialist Georges Demenÿ, supervised the production of chrono sequences featuring soldiers and athletes. Demenÿ designed the 'beater' camera movement, later adopted by many other film pioneers. Exposed on strips of unperforated celluloid negative, the individual positives were mounted around a Phonoscope disc, for direct viewing or small-scale projection. One intended use was (mute) talking portraits, to help the deaf to lip-read. Demenÿ's interest in the commercialisation of motion pictures eventually caused a split with his scientist mentor. (Marey had briefly attempted film projection, but his 1892 projector was not successful.) Initially a commercial failure, with the advent of perforated film Demenÿ's beater mechanism would be successfully exploited in early cinematograph equipment by the Gaumont Company.



Muybridge, Eadweard. Horse Jumping.
The Metropolitan Museum of Art, Harris Brisbane Dick Fund, 1946 (46.160.51) Image © The Metropolitan Museum of Art.

Edison's latest wonder was also to have appeared at the Chicago World's Fair, but wasn't ready in time. From 1888 his assistant William Kennedy-Laurie Dickson had been in charge of developing what became the kinetoscope, the first commercial motion picture film machine. Initial experiments used tiny images set in a spiral on a sheet of celluloid wrapped around a glass cylinder, and viewed through a microscope. Soon Dickson adapted the medium recently adopted by Marey; long strips of celluloid—but Dickson added perforations to register the pictures on strips measuring 1¾ inches (approximately 35mm) in width—the industry standard still used today. The unwieldy electric Kinetograph camera was fixed in a tarpaper-covered studio with opening roof, the building movable to follow the sun. Film production started at the Orange, New Jersey, Black Maria studio in 1893.

Projected moving images of some duration were shown by artist-inventor Emile Reynaud in Paris from October 1892. In 1877 Reynaud had invented the praxinoscope—a spinning-drum toy incorporating a ring of mirrors to reflect the sequential color drawings—followed by a toy-theatre version, and a domestic projection arrangement. His large-screen development of the praxinosope projector became known as the Théâtre Optique. His *Pantomimes Lumineuses* initially used drawings painted on transparent squares mounted on a perforated horizontal belt, and manipulated to-and-fro to produce presentations of 15 minutes with typically 500 pictures. These animated cartoon figures, including Pierrot and Columbine, were superimposed onto a lantern-slide background. The show continued for years.

In 1892 Muybridge, recognising the limitations of his outdated, painted silhouette discs, decided to produce a new series with photographically-reproduced outline drawings coloured-in by hand, to show at the World's Fair. The result was even further removed from his chronophotographs.

Photographic motion picture films as a commercial reality arrived in April 1894, when Edison's kinetoscope was finally launched in a New York "kinetoscope parlour" (penny arcade). Subjects included strongman Eugen Sandow, skirt dancer Annabelle, and boxing enactments. The kinetoscope peepshow was technically simple. A long loop of film, rear-illuminated by an electric bulb, travelled continuously (not intermittently), each frame viewed for a brief fraction of a second through a slot in a revolving shutter; a glimpse short enough to avoid blurring of the image. Kinetoscopes were shipped around the world, and many inventors were inspired to develop screen projection of photographic motion picture films. Soon, many would succeed where Le Prince, Friese-Greene, and Donisthorpe had failed.

By the time Muybridge had completed his final Zoopraxiscope colored discs the Edison kinetoscope had been launched, and in Germany Anschütz had devised a twin-disc Electrotachyscope machine for projecting, with an intermittent mechanism, true photographic sequences. Anschütz arranged public showings from November 1894 featuring similar subjects to the kinetoscope, including a barbershop scene and card players; but of very limited duration. Photographic moving pictures had reached the big screen, and Muybridge abandoned his Zoopraxiscope.

Other chronophotographers also attempted to project their picture sequences. German teacher Ernst Kohlrausch worked independently on the analysis of gymnastic movement. Turning to chronophotography in 1889, he arranged 24 cameras on a wheel. A more sophisticated camera arrangement followed in 1892. Kohlrausch also studied the gait of mentally ill patients. Keen to develop a machine to show the results in movement

while lecturing, his 1892 multi-slide projector featured revolving lenses, but was not successful. A later projector used a rotating light source, but the introduction of cinematography precluded further development.

During 1895 news spread that in France the Lumière brothers, active workers in their father's photographic plate factory, had succeeded in producing the Cinématographe—for taking, printing, and projecting 35mm perforated film by means of a pin-shuttle movement. From February they demonstrated the result, including the one-minute subject *Workers Leaving the Factory*, to photographic and scientific societies.

English engineer Robert Paul was making Kinetoscope copies, but needed a cinematographer to produce the films. Birt Acres, manager of a photographic materials company, had long been interested in the idea of motion pictures, producing glass-plate chronophotographs of cloud formations, and was experimenting with a 35mm motion picture film camera. He took a new mechanism design to Paul, who built it. A successful test in February 1895 led to the production of England's first films, including the *Oxford and Cambridge Boat Race*. Acres departed to Germany in June to film the opening of the Kiel Canal under the sponsorship of the Stollwerk chocolate and vending machine company, and the Pau /Acres partnership dissolved in acrimony.

With his 1894 picture play *Miss Jerry* and others, American lecturer Alexander Black gave many performances of photographic dissolving-scene slide narratives, the "slow movie," just before the public's first view of projected films.

The first film screenings to a paying audience were those of the Eidoloscope, in New York City. Kinetoscope licensees Otway and Gray Latham produced a camera for 2-inch film, and shot an extended boxing match. The projector worked on the kinetoscope principle, with continuously moving film. To prevent a blurred image the shutter aperture was extremely narrow, limiting the size of the projected image. Nevertheless, public performances were given from May, 1895.

In September-October, at the Cotton States Exposition in Atlanta, Georgia, inventors Thomas Armat and Charles Francis Jenkins used their 35mm Phantascope projector to give screenings of kinetoscope films.

By summer 1895 German lanternist Max Skladanowsky had developed a projector using two loops of 54mm film, with double optical and lighting systems, projecting frames alternately from each band. (His first films were taken on an 1892 chronophotographic roll film camera, designed with his brother Emile). With a picture always on the screen there was no blackout period, significantly reducing flicker. The machine was used to project six-second, repeating sequences—subjects included *The Boxing Kangaroo*—at the Berlin Wintergarten theatre from 1st November, and in Hamburg on 21 December. A week later the Lumières opened public shows at the Grand Café in Paris, with such films as *Baby's Breakfast*.

Back in England, Acres demonstrated screen projection in January 1896, and Paul likewise the following month. In the USA, Jenkins and Armat argued and split up, and Armat sold the projector design to the Edison camp. When high-profile shows commenced in New York in April 1896, the machine appeared as the Edison Vitascope.

Dickson had left Edison in 1895, and after briefly assisting the Lathams joined Elias Koopman, Herman Casler and Harry Marvin in an association soon to become American Mutoscope and Biograph (with associated overseas companies). Intending to produce a peepshow to rival the Edison kinetoscope, they soon realised that their hand-cranked mutoscope had a limited future, and devised a projector. The 68mm film negative was perforated in the camera to provide a reference to register the images on the positive. The projector used a gripper-roller to pull down the unperforated print. The huge electric camera was cumbersome but the image was of high resolution, and the large-format Biograph would be used in a limited number of prestigious venues for some years before the company adopted 35mm. Their flip-photo mutoscope appeared in amusement arcades from 1896, persisting as a nostalgic novelty for decades.

As the first film pioneers struggled to project photographic motion pictures onto screens, others continued to use sequence photography for chronophotographic analysis: C.V. Boys with rifle bullets and bubbles, A.M. Worthington the shape of liquid splashes. The introduction of cinematography around the world from 1896 had little effect on chronophotography for analytical purposes, which continued apace, in turn making use of the technical developments of the commercial medium, especially the use of 35mm perforated celluloid; in 1900 Marey constructed a 35mm film version of his chonophotographic gun.

In Paris, from 1896 Reynaud adapted photographic motion pictures for his Théâtre Optique, but in 1900 his show was closed.

In the twentieth century, the high-speed motion picture insect and balistics photography of Marey's successor Lucien Bull and colleagues would provide the transition from chronophotography to scientific cinematography; and from the flickering images of Edison's peepshow would grow a worldwide motion picture industry, communication-entertainment medium, and art form.

STEPHEN HERBERT

See also: Acres, Brit; Anschütz, Ottomar; Brewster, Sir David; Bull, Lucien George; Casler, Herman;

Chronophotography; Dickson, William Kennedy-Laurie, Donisthorpe, Wordsworth, Duboscq, Louis Jules, Friese-Greene, William; Edison, Thomas Alva; , Instantaneous Photography; Kodak; Le Prince, Augustin; Lumière, Auguste and Louis; Marey, Etienne Jules; Muybridge, Eadweard James; Philosophical Instruments; and Rudge, John Arthur Roebuck.

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MOULIN, FÉLIX-JACQUES-ANTOINE (1802–c. 1875)

French photographer

One of the most prominent Parisian photographers of the 1850s, Félix-Jacques-Antoine Moulin worked in many genres, utilizing a great variety of techniques. Sometimes controversial, Moulin aroused a wide range of critical opinion during his years of greatest activity. Today he is best known for his production in certain categories of subject matter, notably the female nude and orientalist figure studies; other aspects of his oeuvre that were admired in his day, particularly his staged genre scenes, are now less familiar.

Born in 1802, Moulin may have come from an artisan background and lacked the art-academy training of some other important early photographers. The circumstances of his training as a photographer are unknown. By the end of the 1840s he was active as a daguerreotypist with a studio at 31 bis, faubourg Montmartre in Paris. Moulin's first documented photographs are academy or nude studies of female models, nominally for use by artists. The fine Two Standing Nudes in the Metropolitan Museum of Art, New York belongs to a series of daguerreotypes depicting carefully lighted models in natural, relaxed poses before plain backdrops. Several of the models are adolescents, their ages carefully noted in inscriptions of the back of the cases. Several closely related daguerreotypes now in Vienna (Höhere Graphische Bundes-Lehr- und Versuchanstalt) bear the inscribed dates 1849 or 1850.

Moulin apparently also essayed less innocent studies that led him into legal difficulties. On July 23, 1851 he was tried by the Cour d'assises de la Seine, together with an optician/dealer, Jules Malacrida, and Mme. veuve René, a maker of daguerreotypes. According to a contemporary acount, the police "...seized at their homes a great number of subjects so obscene that to state even the titles given to them in the judgment would be a violation of public morality; and the reading of this document had to take place behind closed doors, along with the rest of the proceedings" (Annalesde l'imprimerie, no. 6, 1851). Moulin was sentenced to a month in prison and a fine of 100 francs, penalties considerably milder than those meted out to his co-defendants. Since the offending images have disappeared, it is not possible to determine why they were found so objectionable. Serge Nazarieff has attempted to identify a large number of anonymous erotic or pornographic daguerreotypes and salt prints, mainly stereoscopic, as works by Moulin. Of these, the most plausible attribution is an image of a clothed youth embracing a nearly nude girl against the artificial backdrop of a hayfield, a setting also used in a number of female nudes attributed to Moulin; this tableau vivant has some similarities to Moulin's later stagings of more conventional genre subjects.

After this setback Moulin was able to reinvent himself as a more respectable practitioner, opening a new entrance to the same studio through 23, rue Richer. He continued to produce "academies" or female nudes, but from 1853 onward took the precaution of placing prints of these images on legal deposit at the Bibliothèque Impérial, Paris. The young women, often well-known models, in these images adopt seductive poses and are accompanied by such boudoir props as mirrors, jewelry, and draperies, as they are in contemporary photographs by Auguste Belloc, Ambroise Richebourg and others. Usually executed as salt prints, the images are somewhat larger and more atmospheric than Moulin's

Moulin, Felix Jacques. Female Nude standing with back to full-length mirror.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

daguerreotypes. In addition, Moulin offered for sale portraits, genre subjects, and pictures of scenic views and monuments. Technically innovative, he worked with Louis-Amédée Mante to produce prints on artificial ivory and marketed steroscopes and English collodion. With the help of his wife and daughter he also printed negatives by other photographers, acquiring the rights to Roger Fenton's images of the Crimean War.

During the early 1850s Moulin began to show his work in photographic exhibitions, not only in Paris but internationally in London, Amsterdam and Brussels. His work was discussed in such journals as the *Revue photographique*, *Bulletin de la Société française de photographie*, *Le Propagateur*, and *La Lumière*, in which he was mentioned some thirty times between 1852 and 1866. Critics like Ernest Lacan praised Moulin's industry and in particular the artistry of his genre subjects. With titles such as The Spinner, The Fisherwoman, The Drinkers, or Painters at Work, these vignettes of everyday life were actually staged in the studio or outdoors before moveable sets. Moulin also stubbornly continued to exhibit his female nudes, including many among 56 works he showed during the Exposition Universelle in Paris in 1855. The critic Paul Perier, however, claimed to find them vulgar and repetitive, while Moulin's first biographer, the Abbé Moigno, though praising Moulin's hard work and technical competence, suspected the photographer of not being truly contrite about his earlier indiscretions.

In 1856 Moulin traveled to Algeria, armed with a letter of introduction from the Minister of War and accompanied by 1,100 kilograms of baggage. He spent eighteen months traveling and photographing local officials, genre scenes (again often staged on sets), views, and monuments. *La Lumière* published extensive excerpts from his letters from Algeria, written in a colorful, assured style. Moulin's Algerian work again shows his strength in genre subjects, though the views are less effective. Some of these works were engraved and published in 1858 in L'Illustration. Around 1859 Moulin published more than three hundred as albumen prints in albums in several formats, variously entitled *L'Algérie photographiée* or *Souvenirs de l'Algérie*.

Moulin recorded government-sponsored festivities in Cherbourg in 1858 and continued to show his photographs in major exhibitions, but he gradually ceased making original work. In 1862 Moulin advertised the availability of his studio on the occasion of his retirement, though as late as 1866 he submitted work for inclusion in the Exposition Universelle of 1867. Still living in 1875, Moulin does not seem to have remained active as a photographer. To date the diversity of his work in subject matter and technique has perhaps discouraged monographic study or exhibition; most recent research on Moulin has appeared in the catalogues of thematic exhibitions. In recent years, however, Moulin's Algerian work has been shown in one-artist exhibitions in Arles and Algiers.

DONALD ROSENTHAL

See also: Africa, North; Genre; Nudes; Orientalism; and Stereoscopy.

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MOUNTAIN PHOTOGRAPHY

Mountain photography encompasses both mountain systems as landscape forms and the mountain summit as a photographic platform for recreational and scientific purposes. Both types of photography embodied similar technical obstacles. For the purpose of this article, the definition of a mountain will be that offered by the National Geographic Society: any landform with an elevation of more than 1,000 feet (300 metres) above the surrounding land and a pointed summit; the former distinguishes a hill from a mountain while the latter separates a mountain from a plateau. Most of the significant challenges to photography as a science occurred in mountain ranges at altitudes where photographic chemistry and optics become near to impossible due to climatic conditions (freezing temperatures or zero visibility factors). Because of the Euro-American dominance in the field of world exploration, examples of mountain photography are mainly drawn from European and North American sources.

The European Romantic arts movement of the late 18th and early 19th centuries helped set the stage for mountain photography as an art form. Artists themselves, once photographic technology improved enough by the 1880s, also used photographs as an *aide-mémoire* in two ways: in place of and as a complement to field sketches, or more directly as the visual source for their art. Prior to the widespread introduction of halftone printing at the start of the 20th century, photographs were reproduced through a variety of photomechanical processes, not all of which were equally successful at accurately rendering the tonal and other visual qualities of a photograph.

Apart from purchasing original photo prints, including stereograph views and glass lantern slides, of mountain scenes, those interested in acquiring such images could buy view albums or books in which were photomechanical reproductions of mountain photographs. The three most accurate methods of reproduction prior to the adoption of halftone printing were the photogravure, the collotype and the Woodburytype. European and British publishers dominated this market in the 19th century. Among the more prominent of these firms were the Alinari brothers (Fratelli Alinari), Adolfe Braun, George Washington Wilson, and James Valentine.

The three mountain systems which resulted in the earliest notable achievements in mountain photography and large numbers of photographs are the European Alps, the Asian Himalayas and the North American Rocky Mountains. To a lesser extent other mountain ranges in North America, South America, Russia, Asia, Africa, Australia, and New Zealand also attracted photographers.

The daguerreotype process was first used to photograph both the Rocky Mountains and the Alps. The United States Army Corps of Topographical Engineers surveyor and explorer John C. Frémont was the first to bring a daguerreotype kit into the Rocky Mountains between June and October 1842 on his initial foray into the Western United States. He was completely unsuccessful at his efforts to photograph mountain scenery in Wyoming that August. A second expedition in 1843–1844 by Frémont to the Rocky Mountains also included a daguerreotype kit, but no written record survives of its use. Frémont's third expedition in 1845 included an artist, Edward M. Kern, but no daguerreotype equipment. Due to his political activities in California between 1846 and 1848, Frémont ended up resigning from the U.S. Army. He led two further, privately financed expeditions through the Western U.S. with a goal of surveying a route for a transcontinental railroad. On the last of these, in 1853–1854, he hired New York City artist and daguerreotypist Solomon N. Carvalho (1815–1897). A second photographer who used the calotype process, Mr. Bomar, was also hired, but his services were later dispensed with. Despite having no outdoors photographic experience, Carvalho appears not to have hindered the expedition with his photography. According to Palmquist and Kailbourn (2000), it took him up to two hours to produce each view, with most of that time required for removing and repacking his equipment.

In a letter to the editor of the *Photographic and Fine-Art Journal* (v. 8, 1855, 124), Carvalho provided some details of his experiences:

> I succeeded beyond my utmost expectation in producing good results and effects by the Daguerreotype process, on the summits of the highest peaks of the Rocky Mountains with the thermometer at times from 20 degrees to 30 degrees below zero, often standing to my waist in snow, buffing, coating, and mercurializing plates in the open air. In nearly every instance Barometrical, and Thermometrical observations were obtained at the same moment, with the picture. … I had considerable trouble with iodine, which under ordinary circumstances requires 80 degrees Fht. before it will part with its fumes. I had to use artificial heat in every instance; I found it necessary to make up in quantity for the loss of temperature. I generally employed Anthony's anhydrous sensitive [iodine], and my boxes during a continuous use of five months only required replenishing four times, notwithstanding they were opened every time I made a picture, to arrange it smoothly at the bottom. The coating boxes were made expressly for my use on the Expedition by E. Anthony, Esq., and I cheerfully recommend the use of similar ones for like purposes. (Quoted from Taft, 1964, 264–65)

Carvalho's autobiography also summarized the difficulties he faced in the Rocky Mountains. At one point Frémont himself accompanied Carvalho on a three-hour climb to a mountain peak and took meteorological observations while Carvalho produced a panorama of the landscape below (Carvalho 1859, 82). Other primary problems facing mountain photographers of any era were atmospheric haze or hazardous weather conditions. During the dry season forest fires caused by lightning strikes also reduced or destroyed visibility. Although some of Carvalho's daguerreotypes were sent back East and copied by Matthew B. Brady's studio and Carvalho himself ended up an invalid for a while in Salt Lake City, the original daguerreotype plates and apparently Brady's copy prints and negatives were lost.

A similar fate to Carvalho's work also befell that of John Mix Stanley (1814–1872), a well known painter of Indian portraits, an artist on a U.S. Army exploring expedition, and a commercial daguerreotypist. He accompanied a railroad survey led by Isaac I. Stevens through the northern Rocky Mountains to Olympia, Washington, from the spring to the fall of 1853. He appears to have concentrated, given his past interest in documenting the Native American population, in taking portraits rather than attempting landscape views. Stanley's daguerreotypes from this trip are believed to have been destroyed, along with his more valuable Indian Gallery collection of his art, in a 1865 fire at the Smithsonian Institution.

The first large-scale private attempt to commercially photograph an overland route from the East to California in order to lure settlers west was undertaken by the California daguerreotypist John W. Jones in 1851. He travelled from California to Independence, Missouri. Jones also solicited daguerreotypes from other photographers in the surrounding territories. He is reported to have produced 1,500 daguerreotypes on his journey, but no trace of these photographs is known to exist (Palmquist and Kailbourn 2000, 333). Some of these photographs are supposed to have depicted the Sierra Nevada Mountains. A painted panorama based on these daguerreotypes, *Great Pantoscope of California, the Rocky Mountains, Salt Lake City, Nebraska & Kansas*, was opened in 1852 in Boston and circulated for two years in the eastern United States.

Beginning in the early 1850s, wet-collodion negative photographers produced much more dramatic results of mountain scenes than could be achieved with the daguerreotype process. In the western United States, numerous exploring expeditions and adventurous photographers acting alone in the 1860s and 1870s generated substantial numbers of Rocky Mountain views. The California side of the Sierra Nevada Mountains in which Yosemite National Park is situated also saw significant photographic activity, including mammoth-plate views. The most prominent mountain photographers in the United States of this period were Carleton E. Watkins, Timothy H. O'Sullivan, Eadweard J. Muybridge, Andrew J. Russell, and William H. Jackson. Jackson's photograph "Mountain of the Holy Cross" taken in August 1873 while a member of F.V. Hayden's geological survey party, is considered the most important mountain photograph in 19th century America. The construction and completion of the transcontinental railroad in the United States offered some photographers such as Frank J. Haynes unprecedented opportunities for national exposure, not only for his railroad photography, but also as the official photographer of Yellowstone National Park in Wyoming.

Lesser known photographs of the Canadian Rocky Mountains were taken by anonymous Royal Engineers photographers accompanying the North American Boundary Commission surveys of 1858–1862 and 1872–1875. As happened in the United States during route planning for the transcontinental railroads, survey parties looking for suitable routes through the Rocky Mountains and other mountain ranges of British Columbia included photographers. The two most notable photographers who accompanied these geological and geographical surveys were Benjamin Baltzly (1871), an employee of the William Notman & Sons firm of Montreal, Quebec, and Charles G. Horetzky (1871–1879). The construction of the Canadian Pacific Railway through the Rocky Mountains was documented by several photographers, including Richard Maynard and William McFarlane Notman and land surveyors employed by the Canadian government. The Surveyor

Charnaux, Florentin.
Pyramide de Glace sous les Grands Mulets.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

General of Canada, Edouard Deville (1849–1924), is recognized as being the first to use photogrammetry (photographic surveying) on a large scale with dry-plate cameras within the Rocky Mountains beginning in 1887. As a result of the success of his method, Canadian members of the International Boundary Commission of 1892 surveying the mountainous boundary between Alaska and Canada quickly produced visual data from mountaintops which their American counterparts were unable to equal. As happened with the U.S. railroads, the Canadian Pacific Railway encouraged commercial photographers with free passes and sometimes even a special railway car equipped with a darkroom. The company also established its own photographic publicity department whose first photographer was Alexander Henderson. The CPR also imported Swiss mountain guides to the Rocky Mountains. Mountaineering and amateur photographer families such as the Vaux family of Philadelphia sometimes hired these or Canadian guides on their annual expeditions to the Canadian Rockies.

Because recreational mountain climbing developed within the European Alps, the first mountaineering photographs were taken there shortly after the daguerreotype process was announced, but possibly not before the American explorer Frémont's abortive attempts in 1842. A German photographer Friederich von Martens who lived in Paris was appointed to take photographs on a French government expedition to the Alps in 1844. The British art critic John Ruskin claimed to have daguerreotyped the Matterhorn in 1849. Frederick Crawley is credited with the 1854 daguerreotype "Mont-Blanc, Chamonix" (Frizot, 1998, 55). In the early 1860s the French Bisson Brothers produced spectacular mountaineering photographs on Mount Blanc. Some other significant Alpine photographers who were also mountaineers were William F. Donkin (Great Britain), Vittorio Sella (Italy), and Joseph Tairraz (and descendants, France). The French photographer and publisher Adolphe Braun also produced beautiful Alpine photographs during the 1860s. The first detailed photographic survey of the Alps was started in 1859 by Aimé Civiale and published in France in 1882 (*Les Alpes au point de vue de la géographie physique et de la géologie*).

Photographic documentation of recreational mountaineering was encouraged by the formation of climbing clubs beginning in the mid-1850s. Photography was used as an educational aid to assist aspiring mountain climbers in understanding the hazards and physical rigours. English Lake District mountaineers and photographer brothers George and Ashley Abraham documented their rock and mountain climbing activities beginning in the 1890s and encouraged others in this emerging sport. Due to the cumbersome nature of early photographic equipment, however, amateur photography by mountaineers did not produce significant numbers of photographs until after the late 1880s and the introduction of the Kodak roll film camera system.

The Himalayas in Asia, being the highest mountains in the world, attracted many European photographers. None were as initially successful, however, as Samuel Bourne, the first photographer to attempt photography at altitudes thought to be impossible to photograph in. Based in India, he made three trips to document the

Himalayas between 1863 and 1866. Bourne published accounts of his adventures in the *British Journal of Photography*. Like Carvalho before him in the Rocky Mountains, but at much higher altitudes, Bourne described the effects of the cold and the weather on his efforts to photograph at over 15,000 feet elevation in the Taree Pass:

> … while at this elevation I was anxious, if possible, to try a picture; but to attempt it required all the courage and resolution I was possessed of. In the first place, having no water I had to make a fire on the glacier and melt some snow. In the next place, the hands of my assistants were so benumbed with cold that they could render me no service in erecting the tent, and my own were nearly as bad. These obstacles having at length been overcome, on going to fix the camera I was greatly disappointed after much trouble to find that the sky had become obscured, and that a snow storm was fast approaching. Shivering through my whole frame and almost frozen to the ice, I stood waiting to see if it would blow over. It did so in about fifteen minutes, but not in the direction I wanted to take a view; but as there was no probability that waiting longer would better my condition, I placed the camera and proceeded to coat a plate. I thought the collodion would never set. I kept the plate at least five minutes before immersing in the bath, and even that was hardly long enough. Exposed fifteen seconds (size 12 × 10), and found it was somewhat overdone; but my hands were so devoid of feeling that I could not attempt another. I managed to get through all the operations, and the finished negative—though rather weak, and not so good a picture as it would have been if the snow storm had not prevented my taking the view as intended—is still presentable, and I keep it as a memento of the circumstances under which it was taken, and as being, so far as I am aware, a photograph taken at the greatest altitude ever yet attempted. (Bourne, "Ten Weeks with the Camera in the Himalaya," *British Journal of Photography*, February 15, 1864, quoted in Ollman, 1983, 10)

According to Scharf (1976, 91), the highest altitude at which Bourne photographed was 18,600 feet at Manirung Pass. Fabian and Adam (1981, 180) report that until 1880 this was the highest point at which a photograph was taken. The 1880 high-altitude photography was accomplished with the dry-plate process by British climber Edward Whymper during one of his ascents of the inactive volcano Chimborazo (20,703 feet) in Ecuador. Similar problems as faced Bourne in the Himalayas also challenged the Scottish Astronomer Royal and scientific photographer Charles Piazzi Smyth during 1856 expedition to Tenerife, Canary Islands, where he set up a telescope on the volanic peak of Mount Guajara at the 10,700 feet elevation and photographed his activities with a wet-collodion stereo camera. He wrote in his book, *Teneriffe, an Astronomer's Experiment* (1858), which included 20 mounted stereographs, "In taking pictures of the several volcanic phenomena, our camera and photographic tent had been blow over more than once. … [but] other unlooked-for accidents would often occur, amongst the most frequent of which, was the opening of cracks in camera-box, or plate-boards, in consequence of the desert-like dryness of the air" (Smyth, *Teneriffe*, 152, in Schaaf, "Piazzi Smyth at Teneriffe: Part 1, 296–97) Other vexatious problems that hindered Smyth's photography included heat from the sun and sulphur fumes.

The last great mountain photographs of the 19th century were taken during the Klondike Gold Rush by dedicated photographers such as E.A. Hegg, Frank La Roche, and Asahel Curtis (Edward S. Curtis' younger brother). They endured the same hardships as the gold seekers with whom they travelled. Hegg's classic "Packers Ascending Summit of Chilkoot Pass" (1898) captures the chill air as an endless line of mostly men makes their way to top of the 3,739 feet high pass dividing Alaska from British Columbia. Another nearby trail through the White Pass (2,885 feet) formed the route for a railway built between 1898 and 1900 and still operating as a tourist attraction. Harry C. Barley was the official photographer for the railway. Edward S. Curtis was himself also recognized for his 1890s mountaineering photographs in Washington State, which led to his appointment as the official photographers for the 1899 Harriman Alaska Expedition.

David Mattison

See also: Alinari, Fratelli; Braun, Adolphe; Bridges, George Wilson; Valentine, James and Sons; Daguerreotype; Brady, Matthew B.; Wet Collodion Negative; Watkins, Carleton Eugene; O'Sullivan, Timothy Henry; Jackson, William Henry; Russell, Andrew Joseph; Muybridge, Eadweard James; Haynes, Frank Jay; Royal Engineers; Notman, William & Sons; Maynard, Richard and Hannah; Henderson, Alexander; Friederich Martens; Ruskin, John; Bisson, Louis-Auguste and Auguste-Rosalie; Sella, Vittorio; Civiale, Aimé; Bourne, Samuel; Kodak; Roll Film; and Curtis, Edward Sheriff.

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MOUNTING, MATTING, FRAMING, PASSE-PARTOUT, PRESENTATION

Photographs in their mounted and decorative formats often reveal how the photographs fit into a given culture. For the researcher however, the type of frame and style of its decoration define with relative accuracy the date of its making, the social and historical reference of the photo itself, the wealth of the owners of the photographs and their personal, emotional relationship to the person photographed.

The framing of photographs, daguerreotypes, and talbotypes basically served a two-fold purpose in the 19th century. Frames mainly existed to protect the picture from environmental damage, and to decorate the picture it contained. Both simple and ornate decorations established additional roles and possible implications of the frame, such as ornamental details like a larger border and various colours. These details produced the illusion of an extended space beyond the photograph and thus enhanced the effect of the picture. The aesthetic purpose of the frame was successfully fulfilled when harmony was achieved between the picture and its frame. The frame, passe-partout, and installation of the photograph changed throughout time and this was characteristic of and often determined by social groups as well as the technique, materials used, and implementation of the photograph itself.

Out of the pictures that were "written by light" or created using image producing chemicals through the use of various techniques, direct-positive and positive pictures, not the negatives, were only available for mounting or framing. The purpose of photographing played a part in whether the photo was framed or not, and if so, what kind of frame was chosen. More often

than not, artistic and family pictures, and those for private use were framed, while applied photographs for illustrated reports, and scientific purposes mostly remained without a frame unless they were later used for the formerly stated reason.

The expertise of the photographer be it professional, hobbyist or private, was not as significant as the reason or the genre of photographs in determining what would be framed. Amateur, dilettante works, landscape or event photographs were usually rarely placed in ornamental and expensive frames, and on the contrary, that was typical of portraits in the 19th century.

Photographs were thought to be similar to drawings and paintings, and in general, thought to be the more artistic product of the genre of representation, of everyday life. It was especially true if the appearance of photographs were similar to that of a drawing or painting because then the same functions were fulfilled. Early products of positive procedures, like the talbotype positives, Calotype Prints, Talbotype Prints, Salted Paper Prints or the Salted Paper Prints were produced until the 1860s, and so were Plain Paper Prints, which were used to make photographs look like large-sized coloured landscapes. Portrait photographs were meant to look as if they were painted over canvasses to strongly resemble aquarelles or temperas, and to appear passe-partouted or in traditional frames in elegant homes or at exhibitions.

Daguerreotypes were put into expertly crafted, glazed picture-frames varying in thickness mainly in order to protect them and prevent them from being damaged (Karlovits 1973, 33). Another method of protection was to place them into wooden, or from 1854 on, plastic cases called the Union case, which were lined with pressed pigskin, or more seldom with cowhide, or with paper and could be locked with embellished silver snaps. Such cases were manufactured by craftsmen and bookbinders or specialists, according to the Commercial Directory of Birmingham. For instance it is said that John Smith made thermoplastic cases in England from 1859.

The carefully designed cases were decorated with embossed motives. Manufacturers produced millions of cases; therefore the possibilities of different decorations are very vast. The lids of the wooden cases bore the popular decorative motives of plant ornaments. These traditional motives were usually replicated from the cases of miniature paintings and silhouette pictures. Many times the same cases were used for containing daguerreotypes and William Shew, for instance, made such cases in Boston.

Other types of decoration could also be seen on plastic cases to the degree that about 800 patterns can be found today. Between the prefigured earlier forms used for similar functions, replications of prayer book covers or church windows, as well as adaptations of classic paintings can also be found. The themes of the motives vary from religious scenes from the life of the Saint Family to historic Columbus stepping on the land of America to even other popular figures like Cupid, musicians, children, chess players, and fire fighters. Additionally, the art or style in which these cases were made helps historians date the making of the cases; for example, patriotic motives only appeared following the American Civil War.

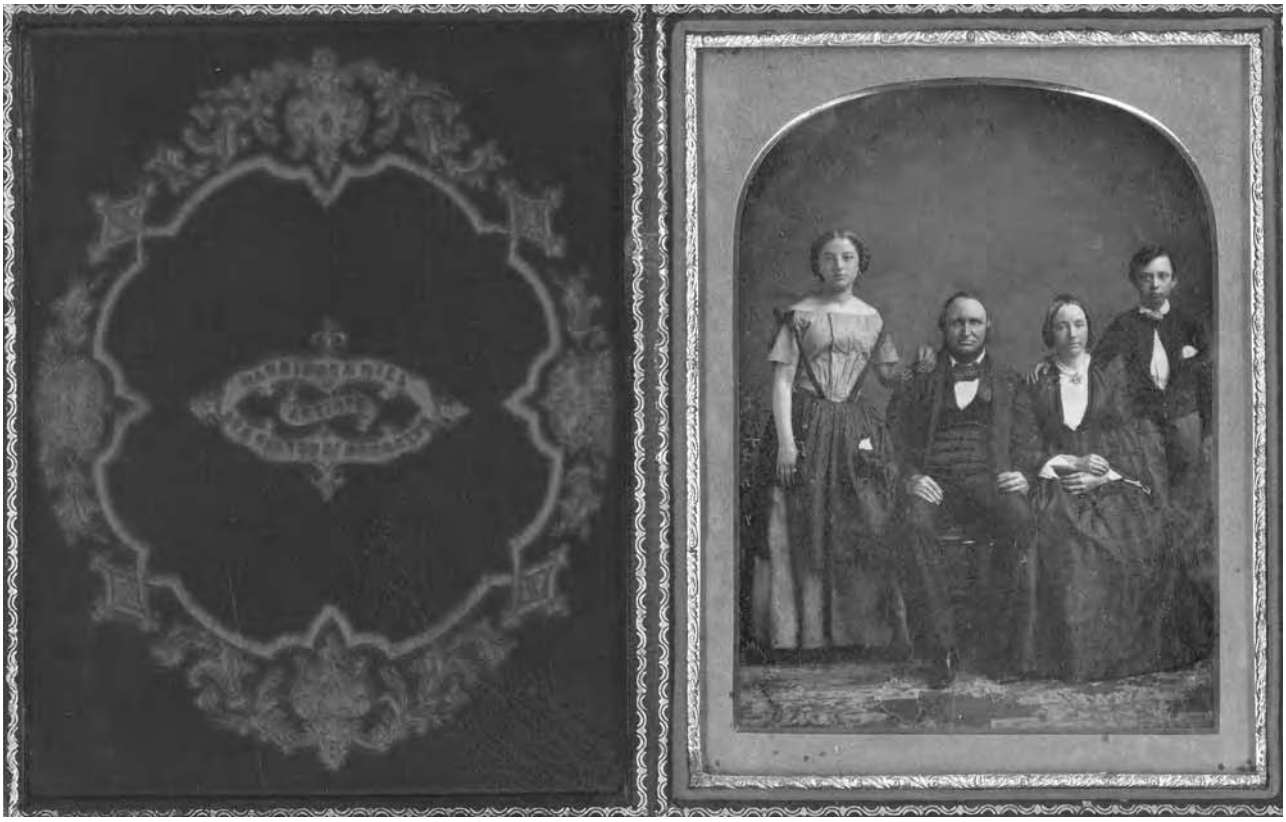
The inside of the case-lids were protected by embossed velvet, while daguerreotypes themselves were protected by decoratively tailored distance pieces like passe-partout made of copper or other material, cover glasses, airtight adhesive tape at the seal, and by carbon from behind. It was not until 1850 that the thin, flexible, gilded brass framing appeared, which held the picture, the passe-partout and the glass together.

The extension of the passe-partout placed above the daguerreotypes was extremely diverse. The shape of the passé-partout served as an indicator in identifying the time period in which they were manufactured as square forms with cut off corners and oval or arched forms were typical of the 1840s, while four-, eight-, nine- or multi-angled arched forms were used until the 1850s. In the decade that followed, the whole surface, primarily the line of the extension, was decorated. The decoration consisted of thinner or thicker lines and circles that closely fit together, thus creating the visual effect of gems or strings of pearls. The surface of the passe-partout could be plain, with no decoration in order to emphasise the picture as much as possible, or it could be richly decorated and consequently the "frame" would give the "picture" the optical illusion of spatiality.

In the 1850s daguerreotypes were relatively costly to make, therefore, they were seldom produced and mainly owned by the wealthy. Their exterior was made to suit the taste of the customers. Portraits functioned as a status symbol through the act of self-representation, and as such, these images depicted mostly people of the higher classes who were usually "framed" in most decadent ways.

Ambrotypes or Collodion Positives on Glass (1851–1885) were placed in cases similar to daguerreotypes. They were used so frequently because photograph dealers and photographers wanted to make use of their leftover stocks after daguerreotypes went out of fashion. Interestingly enough, owners of daguerreotypes often replaced the pictures with new ones in instances where they became damaged or if another person became more important to them, which indicated that installations were valuable articles and why they were inherited throughout generations.

In the decades that followed, multiple photographs became common as more inexpensive media was used. The wealthy favoured the unique, masterly elaborate,



Harrison and Hill. Group Portrait of an Unidentified Family.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

and expensive photographs. These specific forms of installation were miniature Colloido-Chloride, Printing-Out Process, Ivorytype. Photographs on Ivory, and Eburneum Print photographs were concealed and embedded into jewellery or pendants, rings, bracelets, brooches, pins, and badges. Crystoleum, Crystalotype, Chromo-Crystal portraits were fitted into brooches, lids of pocket-watches, and other ornamental pieces of jewellery as well. In such cases, the photograph was not "intended for the public" as much as it was intended for "personal" use, which is apparent not only by the size of the photograph, but also by its location and the occasions for which it was worn. The material on which the photograph lay was usually some precious metal or ivory, but the photograph held the real and symbolic value, which also expressed the personal emotional attachment between the person depicted and the person wearing the picture. One too could include Stamp Portraits (1855) in this group. Although their medium was paper and not noble metal or other valuable material, letter-paper, visit cards, brochures, keepsake albums often had value for the owners of these objects.

As more painters and dexterous craftsmen became involved in photography, unique, high-quality artworks were created with a combination of photographic and painting techniques, for example, collages by Victor Hugo like the Collage de Hauteville House, Guernesey, 1855 or Souvenir de Marine Terrace, 1855. The former picture—having the inscription "Jersey is composed of mysterious colours and details, and is reminiscent of the form of a monstrance. In the focal point of the artwork, a larger photograph taken of the cliff of the exile, can be seen surrounded by other photographs. Decorative, painted architectonic "frames" of the photographs were placed around the original image and though it were a "settings of precious stones." The colours in the picture of ultramarine, gold, and black, and the themes, which were void of the elements of everyday life, impressed upon the viewer a spiritual meaning. As a new member of the Künstler Sänger Verein, an amazing tableau created in 1858, served a similar function. The central element of this composition was an artfully planned text, decorated with graphical elements like illuminated initials. The text was surrounded by 12 ambrotypes, which appeared as ornaments of the frame as if they were "precious stones." This effect was enhanced by the frame and its gilded surface.

Family trees and tableaux of boards, which were made in the last decades of the 19th century, were made for exact purposes in predetermined forms by specialists. The genealogy of the Habsburg family, for instance, was completed in 1864. It basically used graphic elements

like heraldic symbols and traditional place-filling motives in a style typical of the era and applied illustrative elements of printed materials. However, unlike the formerly common family trees, photographs of half-length, three-quarter and full portraits of the family members appeared above the inscriptions of their names.

The second half of the 19th century photography aimed at conquering other spheres of everyday life. In 1854 photographers became interested in placing photographs on china and marble. Ceramic Photographs and Porcelain Photographs were placed on the sides and bottoms of coffee and tea sets, flowerpots, jugs, plates, fruit-dishes, bonbonnières, ashtrays, jewel-cases, vases, cups, decanters, pendants, brooches, pipe-heads, desk-sets, and. The spatial form itself and its presentation coupled with the photographs, and subsequently painted ornamental motives, created the specially shaped artistic mounting and the essence of custom work.

Additionally, mourning family members placed photographs on gravestones for quite some time. The primary function and purpose of photographs was realised here. The medium, which bore the photograph, was itself the installation and at the same time the material and place of use, being the last resting-place of the ancestor, all coalesced to capture the exact and most basic reason for photography. It was in this way that the photograph retained the image of the deceased person "to the end of times" and displayed it for all to see.

In the 1860's and 1870's visit cards, portraits of cabinet pictures, and also newspaper clips and other pictures were made with Albumen Print, Alboidin—Protalbin Paper, Matt Albumin—Albumat Paper, Solio Printing-out Paper, Ferroprussiate, Sepia Paper processes, and other different technologies and were placed in expensive and decorative photo albums of all sizes. These albums had wooden covers bound in elegant cordovan-leather, calfskin, or velvet decorated with embossment, intaglio printing with gilded metal inlays, or hand-painted or -embroidered flowers. These objects were important pieces of furnishing for drawing rooms. Their compilation and exhibition was a fashionable occupation of aristocratic women and studying them was a popular social activity.

At the end of the 1870's, photographs became parts of the interior decoration in decorative frames. They were placed on pianos or chests of drawers. The frames were still works of art, and their material, and elaborate design generally matched the culture, like that of Victorian England. These frames were made of ivory, solid glass with gilded or engraved edges, they were carved and/or engraved, painted wood, gilded or had silvered metals or nickel, and had plush velvet stamped with embroidered flower decorations, and complicated or even simple ornaments. Also "quasi" forms of frames were produced, like easels, doghouses, horseshoes, hearts pierced by an arrow, etc., but by this time, the Oxford-form already had a simple design.

Besides the prevailing modern style frames, picture mountings of former eras, generations, and periods of history remained in use not only because of their own values, but mainly because of the sentiments relating to the images, as was the case of portraits, which served as a visual historical image of a person that a particluar family wanted to respect. If a member of the family passed on, often his/her's image played an organic part in the furnishings of the home.

In the last decades of the 19th century, a procedure was developed which used a new solution, technology, and materials. The golden age of Opalotype was developed in the 1890's. Mainly landscape photographs were made for tourists in important places they wanted to remember. These photographs were applied into souvenirs, desk sets, porcelain trinkets, and into objects later worn as jewellery.

Due to the invention of quick photographs, more inexpensive materials, technological processes, more and more middle to lower class people could afford to buy photographs. Consequently, the usage of photographs in terms of materials, technologies, and decoration changed as did the formerly established norms of what photographs looked like in terms of tastes and style.

Less spectacular but more durable, were cheap pannotypes which were seldom installed, but in the case that they were, it contained a modest passe-partout, glass and a wooden frame. Penny photographs, ferrotypes were seldom placed under glass and were mainly not installed. Their more respected variations were accompanied by paper passe-partout, which were framed with gilded prints and edge ornaments, similarly to religious lithographs.

A special camera with more lenses, was developed for this purpose and very small Ferrotypes (1.5 × 2.2 cm in size), otherwise know as "gems" were made in America. They were applied into different types of jewellery like brooches, pins, pendants, or onto simple white cards, and into special, small-sized albums. One or two of these gems could be placed onto one page of an album ("Cambridge" Album, 1867), and later, even more appeared a page where one could see 3, 4, 5, or 6 at a time (Remick and Rice, Massachusetts). In the oval cut out around the picture an embossed ornament could be arranged, like a simple geometric or flower pattern with colouring. Albums with rich miniature decorations were also made for American aristocracy, while the family albums of the middle class had no decoration at all. The fashion of decorative, coloured cards and albums reached Europe and Australia from America as well. Europeans were familiar with many English, American and Australian photograph albums on which tintypes were built into visit cards. Similarly, in Europe, the edges of

the Ferrotype plates made in photograph booths of the slot automate named "Bosco automat" (Conrad Bernitt, Hamburg, 1895; Budapest, 1896) were folded up around the picture, and the inscriptions came on them such as "Millennial souvenir 1896 Budapest."

Demanding customers could enrich their collections with artworks made with more and more modern technologies, and the qualities of the pictures demanded spectacular installations. Matte Collodion Printing-Out Paper, Platinotype, Platinum print, Palladiotype, Palladium Print, Palladio Paper, Starkepapier were photographs rich in shades of tones with artful effects. The products of noble procedures—like Pigment Print, Carbon Print, Gum Print, Papyrographie, Oil, or Oil Transfer—were painting-like artistic photographs, therefore they were put in passe-partout much larger than the original picture, which was of course in accordance with the fashion of the era, and they received specially formed secessionist wooden frames.

In the last third of the 19th century the majority of photographic products were made by studios. At the same time, however, the cover or back of the photographs served as an excellent advertising surface for the photographer to list his name, site of operation, awards and prices of the studio's products. The typography on the back and at the edges followed the characteristic styles of other applied graphical products which entailed richly decorated firm logos, and medals awarded at exhibitions set into heraldic patterns and were displayed as such. Printed documents serving official and social purposes like letter headings, menu cards, invitations, ball-programmes, memorial certificates, advertisements, programmes, and boxes of photographic raw materials were all made in a manner following the similar eclectic tastes. Graphics and illustrated papers, multiplied by the ease of printing, flooded the main stream by the end of the century, and photographs were no exception.

Sometimes for personal use, pressed flowers were placed around the photograph in the corners of the passe-partout and it was thus framed. Print-clips, mostly of coloured flowers, were purchased in shops and often replaced real flowers, but some photographers copied or enlarged the photographs on designed cartons for unique designs.

The passe-partouts of enlarged photographs were mainly decorated by traditional ornaments, usually with one or more thin or thick line on the edge, while other printed materials like devotional pictures often had decorations in the corners. Embossed edges—gilded or not—were also common.

Three tendencies prevailed in the history of framing and installation of photographs. Formerly used and applied forms of high art and popular culture were inherited, which directly inspired methods of framing pictures through the use of various technologies throughout various eras, including the placement of picture so that it appeared in a mirror. Unique forms were developed particularly for the products of photography and were contigent upon the norms of the different time periods, which adapted to changing technologies. Specialists in serial production and standard forms often produced these forms. A great number of individual variations were also characteristic of framing and installing photographs however, and were conceived as the unique image creating process. These objects were not, or were only partial works of specialists. They were common in the second half of the 19th century, and were characteristic of the increasing number of photographs which were made to order, and for private use. Even if the photographs were placed in purchased prefabricated frames or ones ordered from specialists, often the one giving the present or the user added their own modifications to the frame, passe-partout, or even to the photograph itself.

The wooden frame was often modified with skin, velvet or other textile covering which was typically embroidered or covered with other various decorations. The passe-partout usually had real pressed flowers or later, flowers cut from prints or drawn flowers or leaves placed on it. The photograph itself often had a dedication or message on it. The most archaic variation is the rhyming portrait welcoming letter, which was well known by villagers of eastern towns and villages of the Carpathian Basin. The sender of photographs like these commonly wrote quasi-folklore poems on the photograph or its back, with the idea that the photograph acted on behalf of the person which served to welcome new members of the family, cite complaints, or to ask for accommodations. Photographs were created for individual use, and were most often portraits, group photographs, and sometimes photographs of a landscape or a building. These photographs adapted to the functions of decoration and to the idea of the object. In one or more places, and in different ways and forms, the photograph expressed personal contact. Different means of installation and framing of the photograph primarily fulfilled this function. The individual's tastes, skills, education, and the social status of the photographer automatically reflected this.

KLÁRA FOGARASI

See also: Calotype and Talbotype; Daguerreotypes; Wet Collodion Positive Processes; Collodion; Printing-Out Processes; Tableaux; Carte-de-Visite; Cabinet Cards; and Tintype (Ferrotype, Melainotype).

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MUCHA, ALPHONSE MARIE (1860–1939)
Professional photographer

The arrival of the young Moravian painter, Alphonse Mucha, in Paris in 1887 heralded the beginning of a career which would elevate him to the highest echelons of the Art Nouveau movement. Mucha's paintings, posters and typographic designs epitomise the extravagance of the period.

Mucha's interest in photography dates from about the time of his arrival in Paris, initially commissioning photographs as part of the preparations for his works, but his interest soon became a passion which would endure for the remainder of his life.

By the end of the 1880s he had started to take his own photographs but, according to his son Jiri Mucha, 'he remained the world's worst photographer'—an inaccurate remark as many of his photographs show remarkable visual perception (see Ovenden, *Alphonse Mucha Photographs*, Academy Editions, 1974).

Like many painters of the period, Mucha made extensive use of photographs of models posed in his studio, and many examples of these survive, several squared and ruled up ready to be used as sources for major works.

Mucha became interested in the psychic investigations of Albert de Rochas, the librarian at the Ecole polytechnique in Paris, and in conducting photographic experiments in his studio at rue de Val de Grace, he continued work which de Rochas had started with Nadar decades earlier.

JOHN HANNAVY

MUDD, JAMES (1821–1906)
English photographer

From his photographs it is possible to show that James Mudd was working as an amateur from around 1850. In the *Manchester Trades Directory* of 1852, James Mudd and his brother, Richard are referred to as calico printers' designers at 54 George Street. By 1854 they appear as calico printers' designers and photographers at 94 Cross Street, while the George Street address remains. In 1861, James Mudd appears as a photographer at 10 St. Ann's Square while Richard is still at George Street. In 1871 the firm is recorded as J. Mudd & Son. The son, James Willis Mudd, seems to be connected with the studio from about 1865 although no particular work can be attributed to him. George Grundy worked as an assistant from about 1880 and eventually bought the business in 1895. In the *Directory* of 1900 the firm still appears under the name of J. Mudd & Son although the ownership had passed to Grundy some years previous though the address was now recorded as 10 Police Street. James Mudd and James Willis Mudd continued to work in photography from Bowdon, Cheshire until 1905, after which date all activity ceased. It was only following the death of James Mudd in 1906 that the business was known as G. Grundy & Sons.

The landscape was Mudd's initial interest in photography. Early Mudd calotypes correspond very closely in location with calotypes taken by Joseph Sidebotham in Wales in 1851 or 1852. Both Mudd and Sidebotham were involved in calico printing in the Manchester area thus providing the link for their collaboration. Two landscapes on waxed paper, "Cottages at Trefriw" and "a Watermill" were hung in the *Exhibition of Art Treasures of the United Kingdom* held in Manchester in 1857. Also that year he gave a paper, "Artistic arrangement of photographic landscapes" to the Manchester Photographic Society. It would appear from reviews of various exhibitions in London, Dublin and Edinburgh in the period from 1857 to 1865 that Mudd was considered an equal with Francis Bedford, O. G. Rejlander, Henry Peach Robinson, and Camille Silvy.

In 1857, Mudd produced a series of photographs illustrating the effects on local flora allegedly caused by emissions from a chemical works at Irlam near Manchester. These images, which catalogued the effect of pollution from the works on trees downwind of the site, were taken in support of a celebrated court case, *Regina v. Spence*, which was heard in court in 1857. The court found against the owner of the alum works in question, but while the environmental pollution was proved, the court ruled that the noxious fumes had not had any detrimental effect on the local residents! While not apparently presented in court, these photographs stand

as one of the earliest uses of photography in support of such a legal action. They are preserved in an album in the collection of Salford Library.

Interaction between individuals interested in the emergence of photography played a major factor in its early development in the Manchester area. James Mudd was a member of the Manchester Literary and Philosophical Society being elected to membership in 1852. As a member he would have come in contact with J. B. Dancer; while primarily a scientific and optical instrument maker was a key figure in the early development of photography. Other members included Joseph Sidebotham; James Nasmyth, an engineer; James Mercer, a dye-stuffs chemist; Charles Beyer, the founder of the Beyer-Peacock Locomotive Works at Gorton, near Manchester; and J. P. Joule, the chemist. In August 1855, the Manchester Photographic Society was formed and the first Council included Joule, Sidebotham, Dancer and Nasmyth. James Mudd and Alfred Brothers, who was also a professional photographer, were members of the society and on the Council by the second year of its existence.

Mudd started photographing locomotives and other machinery for Charles Beyer of the Beyer-Peacock Locomotive Works in early 1856. Beyer would have considered his choice of photographer with care. He was meticulous in his control of the designs and production of his locomotives. The photographs by Mudd show his designs to be simple and effective both in aesthetic and functional terms. Initially using the wet collodion process without much success, Mudd reverted to the waxed paper process. By 1857 he was using the dry collodio-albumen process for this work with considerable success. The majority of the photographs were taken at the Gorton Works where he used a 12 × 15 inch camera for pictures of locomotives and whole plate for many of the machines. During the period 1870–75, and in addition to his work for Beyer-Peacock, Mudd was also photographing locomotives made by Nasmyth Wilsons and the Sharpe Brothers.

By 1861, Mudd was in business as a portrait photographer in Manchester's fashionable St. Ann's Square where he used collodion for his carte-de-visites and his cabinet portraits. Later, with the popularity of the CDV reaching its peak there were many "photographic artists" within a small radius of St Ann's Square. Mudd was in direct competition with Alfred Brothers, Silas Eastham and Lachlan McLachlan who all had businesses in the Square itself. Like many of his contemporaries, Mudd would have used the portrait business to form the basis of his income to offset against his speculative activities and also to keep his darkroom assistants in work when other parts of the business were slack.

Mudd's architectural photography shows a remarkable sensitivity for the subject. His early work for Francis Frith, of which "Deakins Entire" was a reject, shows an exceptional range of tonal values as well as a remarkable lens definition over the whole area of the image that is superior to that of his contemporaries. Again he used dry collodio-albumen negatives. For his 11 × 8 inch plates, he uses 4 inch "Lerebour" lens "well stopped down," and for 7 × 5 inch plates, a Dallmeyer Triplet.

Mudd also used the photographic process as a sketchbook for his paintings. Most known paintings date from the period 1875 and 1895. They include "River Liffey, Dublin," "Alderley Church in Snow," "Dunham Park," "Seascape," and "Nant Francon Pass." His ability as a painter can be gauged from the catalogues of the period where they are listed from £50 to £100. In 1977 a painting by Mudd of the opening of the Manchester Ship Canal in 1894 was discovered in Manchester. The painting is described as having "meticulous detail of the Barton Swing Bridge and patterns of the flags which could only be done with (resource) to photographs…. The painting shows all Mudd's misty background effect."

Many of Mudd's photographs and paintings survive as do his papers and writings on aspects of photography. It is evident that he was a fine professional and versatile photographer, a craftsman and painter who achieved considerable stature in the eyes of his contemporaries.

MICHAEL HALLETT

Biography

James Mudd was born in 1821 in Halifax, the son of Robert Mudd, whose occupation was described as a cheese and bacon factor. James Mudd died in Bowdon, Cheshire in 1906. In the *Manchester Trades Directory* of 1852, James Mudd and his brother, Richard, are referred to as calico printers' designers at 54 George Street. By 1854 they appear as calico printers' designers and photographers at 94 Cross Street, while the George Street address remains. In 1861, James Mudd appears as a photographer at 10 St. Ann's Square while Richard is still at George Street. In 1871 the firm is recorded as J. Mudd & Son. The son is James Willis Mudd who seems to be connected with the studio from about 1865 although no particular work can be attributed to him. George Grundy worked as an assistant from about 1880 and eventually bought the business in 1895. By 1900 the firm still appears under the name of J. Mudd & Son although the ownership had passed to Grundy some years previous though the address was now recorded as 10 Police Street. James Mudd and James Willis Mudd continued to work in photography from Bowdon, Cheshire until 1905, after which date all activity ceased.

See also: Art Treasures Exhibition (Manchester, 1857); Bedford, Francis; Rejlander, Oscar Gustav; Robinson, Henry Peach; Silvy, Camille; and Dancer, John Benjamin.

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MULOCK, BENJAMIN ROBERT (1829–1863)

British photographer and civil engineer

Ben Mulock grew up in a Newcastle and London. When he was sixteen, his mother died and his father, the Reverend Thomas S. Mulock, deserted his three children. Because their mother's legacy was held in trust until they came of age, Ben's sister Dinah began writing for a living, and brother Tom, a promising artist, went to sea. He was killed by falling from the mast when his ship was in dry-dock in 1847. In 1848 Ben enrolled at University College London, where he studied Latin, Mathematics and Natural Philosophy with a view to becoming a civil engineer. However, when he turned 21 in 1850 he received £400 from his mother's trust and emigrated to Australia, where he became a farmer and later joined in the gold rush. Four years later, he returned to Europe due to persistent eye troubles, and underwent treatment in Germany and Switzerland in 1854 and 1855. By June 1855 he had joined the Army Works Corps. He spent the first half of 1856 in the Crimea, working on railway provision during the war. Shortly after returning to England in July 1856, he joined the Liverpool Public Offices Engineers Department. During most of 1858 he worked in the office of James Newlands, the City Engineer, and is said to have expressed a desire for "more congenial work." It was while staying at Linacre Grange, a farmhouse north of Liverpool, that he became a self-taught photographer. Some of the pictures he took there have been published in *The Mellards and their Descendants*. He also produced stereographic photographs and panoramas. By December 1858 he was in London, working as a photographer for JJ Mayall, but he was already in contact with John Watson, the contractor for the Bahia and São Francisco Railway (BSFR), who hired him to photograph the first stage of the works in northeastern Brazil. Charles Blacker Vignoles, who designed and supervised the BSFR, was a strong advocate and pioneer of recording the construction progress of engineering works using drawings or photographs.

Mulock arrived in Bahia on November 1, 1859. He described his first impression of the city with an artist's eye: "I never saw a place that pleased me more at first-sight. It stretches round the Bay in the form of a crescent—the shore is high and the houses rise one height above another, intermixed except right in the centre of the town with Banana and Cocoa-nut trees all looking so green." He immediately set about photographing the railway works, beginning with the terminus under construction in Calçada, and continued sending batches of "views" back to the head office in England, often twice monthly via the English and French mails. Mulock worked in the field with a portable darkroom of his own design (a letter he wrote about a similar invention was published in the *Photographic Journal* in 1859). This would also have held his plates and the necessary chemicals for the day's work. Glass plates were coated with chemicals (collodion) immediately prior to use. After processing they were varnished to retain the image. Printing was done on albumen-coated paper, which was sensitized the night before printing. On one particular upcountry expedition, he took 150 photographic plates and the associated chemicals with him, transported on a pack-mule. Only one glass plate broke. Towards the end of the period, he experimented with the new dry process, which enabled him to coat the negative prior to leaving base, and obviated the need to take chemicals with him. It was his practice to take additional plates of his views while in the field, and to transfer or duplicate the resulting negatives when back at base. While Ben was in Bahia, two engravings based on his photographs of the BSFR were published in the *Illustrated London News* (1860).

Mulock returned home six months before his contract expired because he felt there was nothing more for him to do. He took hundreds of photographs during his two and a half years in Brazil, including stunning portraits of the "City of Bahia." The panoramic view of the city as he first saw it, taken from a fort surrounded by water, could be considered his masterpiece. Ferrez writes that its clarity and perfection are unrivalled (1989, 33). The BSFR presented an album of Mulock's photographs to Emperor Pedro II of Brazil, himself an amateur photo-

Mulock, Benjamin. Rosario Church. *Acervo da Fundação Biblioteca Nacional, Brasil.*

grapher, in July 1861. Ironically, it would bring Mulock the recognition he longed for, but only in Brazil. The pictures in the Emperor's album are now housed in the National Library at Rio de Janeiro (an undisclosed number were stolen in 2005) and the Moreira Salles Institute, and have been published by Gilberto Ferrez (1989). The photographs reflect a combination of a civil engineer's eye and artistic sensibility. While Mulock records the facts honestly and dispassionately, he always provides plenty of detail to be gleaned by the interested observer. His style has been compared with that of the "straight photography" movement of the 20th century.

While in Bahia, Mulock had spent more time upcountry than in the city, where he had come down with a serious bout of "intermittent fever" (probably malaria). When he returned to England in the spring of 1862, he was ill, complaining of liver problems. However, by October he was in Swansea, Wales, working as an engineer and surveyor for John Watson. While there, a few months before his death, he wrote to Dinah asking her to send him the photographs of the City of Bahia, which she did. The whereabouts of these pictures are unknown. The same is true of John Watson's collection of Mulock's complete photographs of Bahia. The Vignoles family—direct descendants of C.B. Vignoles and his son Hutton Vignoles, the resident engineer of the BSFR—have donated 137 progress photos to the Institution of Civil Engineers. The Bosch Foundation in Stuttgart, Germany owns a number of Mulock's photographs. There are also four prints at the Harry Ransom Research Center, The University of Texas at Austin.

John Vignoles and Sabrina Gledhill

Biography

Benjamin Robert Mulock was born in Newcastle-under-Lyme, England, on June 18, 1829, the youngest child of Thomas Samuel Mulock, a Dublin-born nonconformist preacher descended from minor Irish gentry, and Dinah Mellard, the daughter of a prosperous Newcastle tanner. Ben had two siblings: Thomas Mellard Mulock, and Dinah Maria Mulock, who attained international fame in her time as a novelist under her married name, Mrs. Craik. In 1840, the family moved to London. That year, Ben began learning music (he played the concertina and the piano) and by 1843 he was showing an interest in civil engineering. He was educated in London. After he came of age and received his inheritance, he traveled extensively. His most important work as a photographer was done in Bahia, Brazil, between November 1859 and April 1862. In early 1863, about a year after returning from Brazil, he began showing signs of "melancholia" and was "placed in Doctor Tuke's asylum in Hammersmith" on June 7, 1863. He managed to escape but was "knocked down and run over by a heavy van" (Reade 1915, 84–85). He died of his injuries five days later.

See also: Mayall, John Jabez Edwin; Vignoles, Charles Blacker; Dry Plate Negatives: Non-Gelatine, Including Dry Collodion; Albumen Print; and Wet Collodion Positive Processes.

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MULTIPLE PRINTING, COMBINATION PRINTING, AND MULTIPLE EXPOSURE

The groundwork of photographic multiple printing, the combining of two or more images to form a new representation, can be found in Johann Carl Enslen's *Face of Christ Superimposed Over Leaf*, 1839. This composite photogenic drawing was made from two photogenic negatives using William Henry Fox Talbot's negative/positive paper process. Between 1841 and 1842 Talbot experimented with soft edge, out of focus masking and pin registered overlay positives to control contrast in his prints of white busts and statues against darker backgrounds to retain highlight detail. This multiple printing method is now called highlight and shadow masking and was also practiced by the Countess of Ross in the early and mid-1850s, Gustave Le Gray, Camille Silvy, and others to print in clouds and skies.

Combination printing was the practice of combining two or more negatives to make a harmoniously, seamless photograph. The practice evolved in order to overcome a major technical obstacle that was blocking photography's recognition as art. This was the collodion wet-plate's insensitivity to all parts of the spectrum except blue and ultraviolet radiation, which gave colors an inaccurate translation into black-and-white tones. Red or green subjects were not properly recorded and appeared in prints as black. Exposures, calculated to record detail in the land, overexposed the sky. The amount of overexposure was not even and produced areas of low density in the negative. When the negative was printed these sections appeared gray and mottled, an effect not suitable for picturesque landscapes. Typically the sky was masked out so that it printed as white. When clouds were needed they were created using chemicals, India ink, and other coloring methods.

The artistic solution proposed by Hippolyte Bayard in 1852 involved making two separate negatives, one for the ground and a second for the sky. This response could have been derived from the earlier daguerreotype cloud studies by Albert Southworth and Josiah Hawes and calotypes by others. After processing the two negatives were masked, with the land's features printed in from the first negative and the sky's from the second. Landscape photographers often made a stock collection of sky negatives, which were used in printing future views. George Barnard used combination printing in his *Photographic Views of Sherman's Campaign* (1866) for clouds and a group portrait of Union general William Tecumseh Sherman and his generals—one general who missed the group photograph was put in later.

William Lake Price was one of the first photographers to exhibit work utilizing this dual-negative technique in 1855. However, it was Gustave Le Gray's spectacular seascapes of 1856–1858, achieved from separately-made cloud negatives, that attracted public attention for both stopping the action of waves and their dramatic cloud formations. Le Gray was not the first to make instantaneous seascapes, but his photographs challenged the notion that photography was an automatic process by clearly demonstrating that photographers could control the medium and translate their feelings into images.

The method caught fire with Oscar G. Rejlander's allegorical tableaux, *The Two Ways of Life, 1857* that plainly verified the artistic potential of combination printing and paved its way to becoming an accepted practice. Rejlander set out to create a photograph that was morally uplifting and instructive and required "the same operations of mind, the same artistic treatment and careful manipulation" as works done in crayon or paint. Rejlander produced an elaborate allegorical piece contrasting Philosophy and Science during a six-week period in which he made sketches, hired models, and produced thirty separate negatives which he masked, printed on two pieces of paper, and connected. This work was rephotographed, and editions were reproduced. The photograph's unusually large size, 16 x 31 inches, made people stop and notice, enabling it to hold its own on a gallery wall. *The Two Ways represents* "a venerable sage introducing two young men into life—the one, calm and placid, turns towards Religion, Charity and Industry, and the other virtues, while the other rushes madly from his guide into the pleasures of the world, typified by various figures, representing Gambling, Wine, Licentiousness, and other vices; ending in Suicide, Insanity and Death. The center of the picture, in front, between two parties, is a figure symbolizing Repentance, with the emblem of Hope." Queen Victoria gave Rejlander's vision a big boost by purchasing it for Prince Albert.

Two Ways did not sell well and provoked debate on the ethics of combining negatives to manufacture an image that never existed, marking an early instance

of critical thinking about the medium. The picture's detractors claimed it was a violation of the "true nature" of photography; works of "high art" could not be accomplished by "mechanical contrivances." In the Victorian age, when piano "legs" were dressed with pantaloons, the photographic nudity of *Two Ways* was shocking. The process of combination printing led to the first photographic montages designed for a public audience, providing an intriguing set of representational possibilities that allowed for the inclusion of subjective experiences and values. As the process questioned established viewing rules, many felt threatened and rejected the new way of picturemaking. The concept that art was a matter of ideas and not limited to specific practices was given voice by the French naturalist Louis Figuier, who believed photography could improve artistic eloquence and public taste, and that "what makes an artist is not the process but the feeling."

The rise of photography as an art form would transform art's function of portraying reality. Photography encouraged artists to explore new directions that eventually included abstraction, in which the concept of art as imitation of nature was abandoned. Rejlander's efforts have been criticized as being "imitations," but were an important and necessary step to expand the boundaries of photographic practice and inspire others to enlarge photography's dialogue within society. The artistic criticism and financial hardships took their toll on Rejlander, however, who only made a few more combination prints; none of them approached the polemic nature and scale of *The Two Ways.*

Rejlander's *The Two Ways of Life* inspired Henry Peach Robinson to undertake combination printing. In 1858, Robinson exhibited *Fading Away*, made from five negatives, showing a young girl on her deathbed with her grieving mother, sister, and fiancée. By Victorian standards this sorrowful scene was scandalously morbid, as it did not conform to accepted ideas about what a photograph should picture. More distressful scenes were painted, but because *Fading Away* was a photograph the public considered it inappropriately realistic and an indecent invasion of personal privacy. After Robinson revealed that his principal model "was a fine healthy girl of about fourteen, and the picture was done to see how near death she could be made to look," the work was criticized for being manufactured.

The combination prints of Rejlander and Robinson challenged the belief that painters alone had the right to "create" scenes while photographers were workmen operating mechanical equipment. For photography to succeed in the art world it had to debunk such confining ideas. Combination printing was given the Royal seal of approval when Prince Albert bought it and gave Robinson a standing order for every pictorial image he created. Once audiences overcame the shock of the combination print, they accepted it, realizing that Robinson's fundamental ideology embraced their notions of art. This made Robinson the most popular, emulated, and well-to-do photographer of the second half of the nineteenth century. Robinson's books and articles actively articulated his position and influenced the development of future photographers. His *Pictorial Effect in Photography* (1869), which advocated the basic canons of painting, "composition and chiaroscuro," as the "guiding laws" of an art photograph, was the most widely read photography textbook of the nineteenth century.

Robinson sought methods for uniting the rational with the subjective, to allow photographers to achieve the picturesque. He believed that combination printing gave "much greater liberty to the photographer and much greater facilities for representing the nature of nature." Critics were outraged by Robinson's constructed images for violating their sense of photographic veracity. Combination printing was acceptable in landscapes as the public was conditioned by painting to expect idealized renditions, but when it came to portraying human beings viewers associated photography with unarranged truth. Robinson was able to expand photography's reach and get the public to embrace his combinations as expressing the accepted allegorical ideals and standards of the day. Robinson's work possesses a duality common to educated practitioners born before the invention of photography who thought like painters. Although Robinson broke no new representational ground, he showed that photography could achieve the same artistic goals as painting, thus allowing the next generation to explore photography's own morphology.

In the short term Robinson's work had the opposite effect. His allegorical ideas, magical theatrical techniques, and moralizing sentiment were so successful that they dominated photographic discourse and stifled other ways of thinking photographically until the 1880s. Robinson's striving for a literary image, reminiscent of nineteenth-century painting, has been in critical eclipse for most of the twentieth century. Yet today Robinson's practices look like progenitors of the postmodern photographers who stage tableaux before the camera and digitally manipulate their materials.

The camera's ability to make multiple exposures was used to create the most common form of multiple imaging in the nineteenth-century that of ghost or spirit stereographs. Ghosts were created when a veiled figure entered the scene for a portion of the exposure, producing a transparent phantom. To maintain believability, less scrupulous operators concealed their methods from the public and used ploys such as: a plate with a previously recorded ghost image, a transparency of a ghost image placed in front of the lens, a miniature ghost transparency placed behind the lens, or a ghost image

Hobson, W.S. Amateurs playing ghost scene. *The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum,*

reflected into the lens during exposure. These representation were the result of *spiritualism*, a dubious spin-off movement of Transcendentalism that was founded in Rochester, New York, in 1848 by the medium Margaret Fox and her sisters, who later admitted their activities were fraudulent. Spiritualists believed that the human personality survived death and could communicate with the living through a medium that was sensitive to the spirit's vibrations. This gave rise to so-called spirit photography, which purported to make visual records of ectoplasmic manifestations of persons in a state beyond death. William Mumler, who ran the best-known spirit photograph studio in New York in the early 1860s, was eventually arrested as a swindler, though the charges were eventually dismissed because trickery was not proved. Nevertheless, spirit photographs attracted a large audience of predisposed believers who paid no attention when it was demonstrated that spirit photographs were produced by double exposure or multiple printing. Other photographers used these techniques and got into this commercially viable escapade without making any supernatural claims. To help sell his stereoscope, Sir David Brewster suggested making "ghost" stereo cards for fun; they quickly became a fad. Although Americans did not get involved with allegorical combination printing, spirit pictures encouraged experimentation with multiple exposure and acceptance of this style of depiction. Even though ghost cards were known to be fabricated, the fact that they were done photographically gave the appearance of truth. Spirit photography spread to Europe during the mid 1870s and again in the 1890s. These were times of recession for portrait studios, and ghosts were good for business.

For the intellectually inclined, John Thomson was the first to incorporate the multiple print concept in order to fashion two three-part panoramas in his limited edition book *The Antiquities of Cambodia; a series of photographs taken on the spot, with letterpress description*, 1867.

ROBERT HIRSCH

See also: Talbot, William Henry Fox; Le Gray, Gustave; Silvy, Camille; Wet Collodion Positive Processes; Wet Collodion Negative; Bayard, Hippolyte; Southworth, Albert Sands, and Josiah Johnson Hawes; Barnard, George N.; Price, William Lake; Rejlander, Oscar Gustav; Victoria, Queen and Albert, Prince Consort; Robinson, Henry Peach; Mumler, William H.; and Brewster, Sir David.

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MUMLER, WILLIAM (1832–1884)
The first spirit photographer

Originally an engraver in Boston, Mumler was learning the trade of portrait photography in 1861 when, by his own account, a spirit 'extra' suddenly appeared on one of his plates. His newly discovered powers as a photographic medium were eagerly reported in the local Spiritualist press and he soon had many clients coming to his studio who were grieving for lost loved ones. Grateful sitters included Moses Dow, who was photographed with the spirit of his adopted daughter seeming to offer him a white rose, and the widow of Abraham Lincoln, who was photographed with Lincoln appearing to rest his hands on her shoulders. Many cartes-de-visite such as these were produced and sold as proof of spirit survival throughout the world-wide Spirititualist movement. After moving his business to New York he was arrested for fraud in May 1869. At the sensational trial prominent Spiritualists testified to their belief in his powers, whereas witnesses from the photographic industry enumerated the various ways identical effects could be obtained through double exposure. The judge reluctantly dismissed the charges because Mumler hadn't been caught in the act. He returned to Boston where he continued his business for several more years. In 1875 he published his memoirs, which were full of the testimony of grateful clients.

Martyn Jolly

MUNDY, DANIEL LOUISE (c. 1826–1881)
English photographer

Daniel Louise Mundy (1826/7–1881) was born in Wiltshire, England, and arrived with sufficient capital (from the Australian goldfields perhaps) to buy into a well-established photographic business in Dunedin in 1864. At this time, the province of Otago, was experiencing a gold rush. So any previous experience he may have had in Victoria would have served him well in these turbulent times. Following on from this, Mundy staged a well timed move north to Christchurch in the mid to late 1860s. This was during the height of great public expectations about finding a route through New Zealand's Southern Alps to the West Coast Goldfields. Mundy seized upon this sense of high commercial expectation with a splendid set of scenic photographs showing the road as it existed between the two provinces. After Canterbury, Mundy moved to Wellington and then onto Auckland. Before he'd realised it, he'd practically photographed all of New Zealand's major settlements. As well he spent a lot of time in the Hot Lakes District photographing the Pink and White Terraces which were being billed as one of the Seven Wonders of the World. He returned to England in the mid 1870s and lectured on his photographic exploits, publishing two books, *Rotomahana and the Boiling Springs of New Zealand* (1875), and *The Wonderland of the Antipodes* (1873) that were illustrated with his photographs using the autotype process.

William Main

MURRAY, JOHN (1809–1898)
British surgeon and photographer in India

John Murray came to India in 1833 as a civil surgeon in the employ of the East India Company. Having settled into his post at Agra by the mid 1850s, Murray had already taken up photography, the value of which for documentary purposes was recognized in the military and civil establishment on the subcontinent. In 1856, Murray's fellow surgeon John McCosh had written in his *Advice to Officers in India*, "I would strongly recommend to every assistant-surgeon to make himself a master of photography in all its branches" (45–46). Murray focused his attentions particularly on architectural views of Mughal India and environs, which comprise some of the most intriguing imagery of the decade in a large corpus of plain and waxed paper negatives and corresponding salted paper and albumen prints.

Murray participated in the photographic culture of his day both in British India and in London. Twenty seven of his large salt prints were displayed at the first exhibition of the Bengal Photographic Society in March 1857; these were listed by title in the show's catalogue, and included landscapes of the hill station of Nynee Tal and the Mughal architecture of Agra. Like other photographic societies of the period, Bengal had formed to provide support for serious amateurs and commercial operators who shared a common passion for the medium—the best of photographs judged by their topicality or associative interest as well as artistry and technical execution. Murray continued to show his photographs at least until 1867, though they had been deemed earlier in the decade somewhat wanting in resolution compared with the results of the wet collodion on glass process. He remained a member of the Bengal Photographic Society until his departure from India at his retirement in 1871.

In November 1857 John Hogarth exhibited Murray's paper prints in London, reinforcing the political and cultural ties between the metropolitan center of the homeland and Britain's occupation of the subcontinent.

Murray, John. The Taj Mahal from the Bank of the River, Agra.
The Metropolitan Museum of Art, Gilman Collection, Purchase, Joseph M. Cohen Gift, 2005 (2005.100.71) Image © The Metropolitan Museum of Art.

Murray was in the city during this time, having taken leave of absence from his post in Agra from April 27, 1857 to February 5, 1858. As a seller of fine prints at Haymarket, Hogarth had understood the importance of photographs not only as aesthetic objects but as agents of pronounced sentiment associated with British colonialism. The pictures offered viewers a graphic opportunity for imaginative reflection on India's past and carried potent meaning with respect to the bloodshed that was presently occurring between native India and the British. This was the rebellion of sepoys—Indians pressed into the service of the British army—which had broken out in May 1857, and was soon to become a populist uprising. Known variously as the Indian Mutiny and Rebellion of 1857, the fighting, brutal and devastating to both factions, ultimately hardened British resolve to impose imperial authority over India under Queen Victoria. Hogarth exhibited thirty of Murray's 15 × 18 inch prints from calotype negatives. The December 1 issue of *Art Journal* posted a review of Murray's work, which the writer observed to be "a series of beautiful photographs, presenting localities that must hereafter be regarded with an interest far beyond that which ordinary historic events communicate." Murray's artistry notwithstanding, the reviewer was clearly making reference to the insurgency. In 1858 Hogarth published a volume of the doctor's views, *Photographic Views in Agra, and Its Vicinity*, with descriptions by J. Middleton, Principal of the Company's College at Agra. This was followed the next year by *Picturesque Views in the North-Western Provinces of India*, also a Hogarth production, with text by Major-General J.T. Boileau. Boileau appreciated the subtlety of craft and picturesque appeal of Murray's pictures, while drawing special attention to evidence of politically symbolic import within individual views—a Union jack, for instance, atop the famous Delhi Gate of Agra Fort, "the emblem of British supremacy in India." Among other noteworthy practitioners on the scene in the aftermath of 1857 were Felice Beato, Charles Shepherd, and the photographer couple Major Robert and Harriet Christina Tytler, who were assisted in their art by Beato and Murray himself.

As a doctor Murray found correlations between the land and diseases endemic to monsoon climates. He kept a valuable medical library (moved for protection during the peak of the rebellion), published studies on cholera, and on the topography of localities in north central India. Thus, while many of his photographs emphasize the architectural legacy of the Mughal empire, they include features that bear testimony to an intimate knowledge of the terrain beyond an eye looking for the picturesque. A series of pictures from Agra Fort overlooking the Jumna River, for instance, reveal seasonal changes, where the water level varies, sand bars shift, and foliage flourishes or diminishes. They suggest an awareness of how visual evidence might serve to demonstrate existing conditions of place that would complement any written report. These and many other prints whose

main subjects appear ostensibly as the grand edifices of Mughal palace precincts and fortifications yield to the persistent observer the contrast of vernacular habitations of indigenous peoples.

Murray's documentation of such places coincided with European scholarship toward the systematic grasp of India's place in world culture. Historians under the new Raj especially venerated the achievements of the great Mughal dynasties, sometimes at the expense of India's Hindu past. Murray himself was acknowledged in the English press of the period as contributing to efforts to preserve the Taj Mahal ("Mofussil letters, Agra Dec 31, 1863," *The Englishman*, Jan 7, 1864), and the evidence of restoration is visible in certain of his pictures of Akbar's Palace and Agra Fort. Hence, however compelling subsequent photographers found the red sandstone and marble forts, palaces, and mosques, and other edifices of Britain's powerful predecessors, Murray's pictorial interests were well informed by his commitment to service and abiding concern for securing the cultural heritage of his adopted home.

GARY D SAMPSON

Biography

John Murray was born in November 1809, to Alexander Murray, a farmer in Blackhouse, Aberdeen County, Scotland. He received his M.D. at Edinburgh in 1831, successfully passed his examination to become Assistant Surgeon with the United East India Company in 1832, arriving in India the following year. By 1848 he was full Surgeon at Agra, made Deputy Inspector General in 1858, following nearly a year's leave in London during the Indian Rebellion, rising to Inspector General in 1865. His peak period of photography began in the mid 1850s and lasted until the early 1860s, which resulted in hundreds of views of Delhi, Agra, Fatehpur Sikri, Cawnpore, Benares, and elsewhere, many associated with the 1857 hostilities and Mughal India, and at least in part made at the request of Lord Canning, Governor General of India at the time. His method of choice was an variation of LeGray's waxed process, where the negative was waxed twice for greater detail—once before sensitization and once after exposure. His pictures appeared in a number of exhibitions and publications through his associations with the Bengal Photographic Society and with John Hogarth in London (see bibliography), and some were translated to wood engraving as witnessed in the *Illustrated London News*. He retired in 1871, leaving India, and died at Sherringham, Norfolk, July, 1898.

GARY D. SAMPSON

See also Felice Beato; John McCosh; Societies, groups, institutions, and exhibitions in India; India and Afghanistan; Waxed paper negative processes; Architecture; History; Topographical photography; Harriet and Robert C. Tytler.

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MURRAY, RICHARD (UNKNOWN) AND HEATH, VERNON (1819–1895)

The career of Murray and Heath can be divided into two phases. In late 1855 or early 1856, Richard Murray and Vernon Heath began a firm of opticians, specialising in scientific and philosophical equipment. During the following five years, they built a reputation as one of the premier firms supplying photographic apparatus and material. As well as a their own design of stereoscope and carte-de-visite cameras, Murray and Heath's stock included a variety of accompanying lenses, camera stands and special field boxes for outside work. Other scientific equipment sold by the firm ranged from opera glasses and microscopes to galvanic batteries.

Little is known about Richard Murray aside from the fact that he worked for a period at Newman's opticians in Regent St, which supplied stereoscopic lenses to Sir Charles Wheatstone in 1832. Vernon Heath (1819–1895) was the nephew of Lord Vernon, the art philanthropist who bequeathed his extensive collection of paintings to the National Gallery. Heath's reminiscences were published in 1892. They detail his career and constitute one of the first book-length memoirs by a photographer.

Many notable photographers and institutions used Murray and Heath's optical equipment. The firm supplied apparatus to Queen Victoria and Prince Albert in 1857, a privileged position that they advertised through their catalogues, all of which carry the royal arms. Other customers included the Board of Trade, the Foreign Office, Admiralty, and the East India Company. The

reliability of their cameras under difficult climactic conditions is reflected in the fact that it was used during Lord Elgin's visit to China and on Livingstone's journey to the Zambesi in 1858.

The repute of Murray and Heath was such that their equipment was reviewed in the *Art Journal* in 1859. Their cameras were praised for both their durability and the numerous minor technical innovations they had introduced. The review concluded that Murray and Heath could have "but small necessity for our praise, yet it affords us real pleasure to add to our testimony upon their photographic apparatus to that of the most distinguished photographers."

At the beginning of 1862, Murray and Heath sold their business to Charles Heisch, Professor of Chemistry at Middlesex Hospital. Heisch was also a keen photographer and a regular contributor to the pages of the *Photographic News*. A new catalogue issued by Heisch promised to "maintain the high character already established by this house, more especially for Apparatus suited to the tropical climates." The firm continued to operate under the name of Murray and Heath at 43 Piccadilly. However, the following year, Vernon Heath started as a full time photographic studio from the same address.

Heath operated at 43 Piccadilly between 1863 and 1876, and as Vernon Heath & Co. between 1877 and 1885. He was made bankrupt in early 1886, but was working at the same studio again between 1887 and 1888. Heath's interest in photography began in January 1839 when he heard Faraday announce Daguerre and Fox Talbot's discoveries at the Royal Institution. Sometime after the death of Lord Vernon in 1849, Heath started work a professional photographer. His early pupils included Dr. Livingstone and the young Prince Alfred, the future Duke of Edinburgh. Royal commissions feature prominently in Heath's career. In 1862, he was involved in a court case with a publisher, Robert Mason of Paternoster Row, over a disputed negative of Prince Albert. The case, which Heath won, centred around the number of negatives Heath had agreed to take for Mason, who wanted to use them for *carte-de-visite*.

At the wedding of the Prince of Wales in March 1863, Heath enjoyed the honour of being invited by Queen Victoria to photograph the marriage ceremony in the Chapel Royal at Windsor. Heath subsequently became a friend of the Prince and Princess of Wales. He was invited to Sandringham on several occasions, and made £1,000 from a photograph of two of the Prince's Indian mastiffs. His work for the royal family continued as late as 1887, when he was asked by Queen Victoria to photograph her Golden Jubilee garden party at Buckingham Palace.

One important technical innovation introduced by Heath was a means of reproducing and enlarging negatives. The process came about through his attempts to ensure that he could produce enough pictures of Prince Albert from the single negative involved in the court case. Heath's process involved printing a positive transparency of the negative on glass instead of paper, and then using this transparency to make more negatives. The process, with some modifications, became the principal means of enlarging negatives. Heath gave a paper describing his technique at the Photographic Society of London in March 1862, which was also published in the *British Journal of Photography*.

Heath's pictures included both portrait photographs and landscapes, although he was more renowned for the latter. His work often stemmed from high profile social connections. These included a request from Lady Burdett Coutts in 1867 to picture a garden party; photographing the Landseer's lions at the base of Nelson's column; and being commissioned by the Admiralty in 1865 to record details of the French fleet visiting Portsmouth. Much of his best photography stemmed from picturing Scottish landscape, often through long visits to the estates of Scottish noblemen. After one typical visit to the Duke of Argyll's estate in Inverary, Heath took a photograph of Glen Shira, which he then enlarged to 43 × 53 inches. For this and other pictures he sent to the Paris Exhibition in 1878, he was awarded the only gold medal for landscape photography given to British photographers. In his latter years, Heath was a strong advocate of the autotype process and gave a paper at Royal Institution on the subject in February 1874.

One unexpected admirer of Heath's landscape work was John Ruskin. In 1882, Ruskin wrote in reply to an approach from Heath to view his work:

> If you could know how often I have paused, in my greatest hurries, at that recessed window in Piccadilly, and how often I have retired from it in a state of humiliation and wretchedness of mind, and accused first the sun, and then you, and then the nature of things, of making all one's past labours hopeless, you would understand the interest I shall have in really seeing you. (Quoted in *Vernon's Heath's Recollections*, 294)

Vernon Heath died on 25 October 1895, and an obituary in *The Times* singled out his pictures of Burnham Beeches for particular praise.

JOHN PLUNKETT

See also: Cartes-de-Visite; Stereoscopy; Victoria, Queen and Albert, Prince Consort; Faraday, Michael; Daguerre, Louis-Jacques-Mandé; Talbot, William Henry Fox; and Photographic Exchange Club and Photographic Society Club, London.

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MUYBRIDGE, EADWEARD JAMES (1830–1904)

Born Edward James Muggeridge, also known as Muggridge, Maygridge, Muygridge, Eduardo Santiago Muybridge. He was a photographer, inventor, and lecturer. One of the most influential and colourful photographers of the nineteenth century, Muybridge's achievements span three distinct categories: landscape photography, motion photography, and early cinema. The motion photographs, in particular, are among the most easily recognized photographs of the nineteenth century, comprised of grids of instantaneous photographs of humans and animals performing various behaviours and taken in rapid succession.

Although he was born in, and retired to, the London suburb of Kingston, his entire photographic career was spent in the United States. Muybridge was one of four sons born to Susannah and John Muggeridge, Kingston merchants recorded as selling coal and later grain. After attending Queen Elizabeth's Free Grammar School, Eadweard moved to London, apparently to receive vocational training. He may have been apprenticed in the city, but records from this period are scant, and his tendency to exaggerate biographical details renders information about his early training suspect. Around 1851–52 he settled in New York City, where he was an agent of the London Printing and Publishing Company, arranging the importation of unbound books from London for their binding and sale in the United States. He also worked for Johnson, Fry and Company, an American publishing company with offices in Boston, New York and Philadelphia. His work seems to have involved a considerable amount of travel. In his personal scrapbook, now in the collections of the Kingston Museum and Heritage Service, visits to numerous American cities are mentioned, including New Orleans and other shipping ports in the United States. Around 1855 Muybridge set out on his own, establishing a booksellers at 113 Montgomery Street in San Francisco. He also remained an agent for London Printing and Publishing. His interest in books persisted throughout his career, and many of Muybridge's photographic projects were conceived as bound volumes.

Around 1858 Muybridge's brother George joined him in the San Francisco book business, followed by his youngest brother Thomas. George is thought to have died of tuberculosis shortly thereafter. In 1860, Eadweard decided to return to New York and London, presumably on business. His decision to take a stagecoach rather than an ocean liner proved fateful. On July 2, 1860, his Overland Stage coach crashed in Northeast Texas, and Muybridge suffered a severe head injury. He was knocked unconscious and was said to have lost his senses of taste, smell, and hearing for several months. After two months convalescing in New York, he continued to London where he was under the care of Sir William Gull, Queen Victoria's private physician. In total he spent about a year recovering from the accident. Several scholars have attributed changes in Muybridge's personality to this injury, theorizing that he suffered brain damage. The veracity of this claim may never be proved, but his unorthodox and mercurial personality in his adult working life is undisputed.

Like much of his early life, Muybridge's whereabouts from 1861 to 1867 are mysterious. His return to the United States was almost certainly interrupted by the Civil War. However, by 1867 Muybridge was back in San Francisco where he quickly established himself as a successful landscape photographer. It is unclear whether he learned to photograph in England or the United States. An amateur photographer named Arthur Brown has been nominated as a possible teacher in England. In the United States, Muybridge befriended the Daguerreotypist Silas T. Selleck (active 1850s–70s), who is thought to have worked for Mathew Brady before moving to San Francisco. If Selleck provided photographic training, there is little evidence of this. Claims that Samuel Morse taught Muybridge appear to be spurious.

In late 1867 or early 1868, Muybridge and Selleck opened a studio in San Francisco specializing in photographs of California and the Pacific Coast. Landscape dominated his practice for about six years. He began with views of San Francisco, and then photographed the Yosemite Valley. By 1868 he had moved to Vancouver and Alaska; later he would photograph Pacific coast lighthouses, the Farallon Islands, geysers and railroad lines. He developed an astonishing virtuosity with the camera, producing mammoth plate albumen prints scarcely rivalled in their beauty. Soon his works challenged his principal rival in California landscape, Carleton Watkins (1829–1916). Many of Muybridge's images were published under the name "Helios," a reference to the sunlight used to expose them. He also dubbed his operation "the Flying Studio."

By 1872 Muybridge had become affiliated with the studio of Bradley and Rulofson in San Francisco, where he was recognized as the outdoor photography

specialist. When Leland Stanford, former Governor of California, United States Senator, and President of the Central Pacific Railroad, approached the studio with a commission to photograph galloping horses, Muybridge was assigned the case. Whether Stanford already knew Muybridge, possibly as a result of his railroad photographs or other contacts, is unknown. As a horse breeder and avid reader of equine literature, Stanford wished to obtain photographs of a horse's gait in order to ascertain whether it has all four hooves from the ground at any point in its stride. This necessitated an unprecedented degree of instantaneity as it required exposures faster than the naked eye could see. Initially, Muybridge set about the project using wet-plate collodion materials, which are inherently slow and awkward to use. The motivation for Stanford's commission has been the subject of much speculation, but was almost certainly prompted by a friendly disagreement with a rival. The oft-repeated claim that Muybridge was retained to settle a substantial wager does not appear to be true.

There are conflicting accounts about the date and location of Muybridge's first horse in motion experiments. The subject of the photographs is said to have been Stanford's fast horse Occident. Some reports place the first attempts to photograph him in May of 1872 at the Union Park Race Course in Sacramento, but if such experiments occurred they do not appear to have been successful. Subsequent attempts may have occurred in Sacramento the following year, but a young assistant, Sherman Blake, recalled them being conducted at the Old Bay District Track in San Francisco, which Stanford helped construct. Most probably they were begun unsuccessfully in Sacramento during one of Muybridge's trips to Yosemite (Muybridge photographed there in 1867 and 1872), and moved to San Francisco to be nearer to his base of operations. In any case, photographs from this period have not been preserved. Both Muybridge and Stanford said they were too fuzzy and indistinct to merit publication, but were adequate to judge the position of the horse's hooves. The only visual record of these earliest experiments exists in the form of drawings, possibly copied from lantern slide projections, currently in the collections of the Iris and B. Gerald Cantor Center for Visual Arts at Stanford University, and a Currier & Ives lithograph of Occident trotting published in 1873.

In 1873 Muybridge created a series of photographs documenting the Modoc Indian War. Muybridge was sympathetic to the Native American fighters, who were resisting violent forced resettlement and took refuge in the rocky chasms outside the Lava Beds, near the Oregon border. He produced some thirty-one stereo views of the campaign, which were published by Bradley & Rulofson. Muybridge claimed to have photographed both sides of the conflict, but scholars have identified his photograph of 'A Modoc Brave' as a member of a rival tribe, and his other photographs of Modocs seem to have been made exclusively from prisoners.

In 1874 Muybridge's career was interrupted by an infamous series of events culminating in the murder of his wife's lover. In 1872, at age forty-three, Muybridge had married a twenty-one year old divorcé named Flora Stone. The next year Flora began an affair with a dandyish socialite named Major Harry Larkyns. Muybridge warned them apart, and when Flora became pregnant in 1873, he had no reason to suspect the child was not his own. The truth was revealed when Muybridge found a photograph of the child, whom he and his wife had named Floredo, with an annotation on the back reading "Little Harry." Muybridge had never seen the picture before, which had evidently been sent to Flora by Larkyns. With the parentage of the child deeply in doubt, Muybridge flew into a rage and determined to avenge himself. He travelled roughly eighty miles to the city of Calistoga in northern Napa County, where Larkyns was staying. He traced him to a house on the grounds of the Yellow Jacket Mine, and called him to the door. Witnesses record him as saying, "Good evening, Major. My name is Muybridge. Here is the answer to the message you sent my wife." He then shot Larkyns once near the heart. Larkyns died instantly. Muybridge was arrested and tried, but acquitted on grounds that the killing was a justified defense of his family.

Released from jail Muybridge travelled to Central America, where he spent the next year photographing the landscapes of Guatemala and Panama, and particularly the workings of coffee plantations. The brooding, atmospheric quality of these photographs gives some indication of his turbulent mental state at the time. After his return, in January of 1877 Muybridge produced two dramatic panoramas of San Francisco from the hill at California Street: a "small" panorama of twenty-two panels each approximately 7 × 8 inches, and a "large" panorama of thirteen panels, each approximately 21 × 16 inches. When fully extended the large panorama is 17'4" long. The panoramas represent Muybridge's last concerted effort at landscape photography before fully immersing himself in the motion photography for which he became world famous.

After a hiatus of some four years, Muybridge resumed his project photographing horses for Stanford in 1877. This time, the photographs were made at Stanford's farm in Palo Alto, which would later become the campus of Stanford University. An ambitious scheme was devised not just to photograph a single moment in a horse's stride, but also to make a succession of photographs at regular intervals, each isolating a particular moment in an animal's stride. State-of-the-art lenses were ordered from Dallmeyer in London, and cameras were commissioned from Scoville in New York. Muybridge also claimed to have developed a speedier chemistry, which

enabled more rapid exposures. To maximize available light and further shorten exposure, Muybridge built a track with an angled whitewashed wall on one side to reflect light, and scattered the ground with lime. Working with Stanford's engineers (who included telegraph designers), Muybridge and his team rigged the cameras with automatic shutters—at first these were purely mechanical but later they were electrically fired. Two basic systems were employed. For free-running horses, thin threads were drawn across the track which the horses would break as they ran, each successive thread activating a shutter. For horses pulling sulkies, the threads were buried underneath the track and pressure activated by the weight of the carriage's wheels.

The new system was fully operational in 1878. Its sophistication outstripped anything attempted previously, and is hardly foreshadowed in his earlier motion experiments. Not only did it enable Muybridge to photograph animals moving at speeds never before photographed, it also resulted in distinctive sequences of imagery delineating the transitions from one posture to another. Muybridge published them in grids, initially of twelve frames. To launch the new venture Muybridge held a press conference on June 15, 1878, in Palo Alto. Newspaper and magazine representatives in attendance, and photographs were made using the new system. Two horses were photographed, Abe Edgington (trotting) and Sallie Gardner (running). The Abe Edgington photographs were published as the first in a set of six cabinet cards titled *The Horse in Motion;* the Abe Edgington image became known as *Abe Edgington trotting at a 2:24 Gait*. Abe Edgington was the subject of three sequences in the set. The others depicted Mahomet, Sallie Gardner, and Occident.

Reproduced and disseminated throughout the world, Muybridge's *Horse in Motion* grids were the most sensational photographs of their day. Contemporaneous accounts describe crowds gathering outside shop windows in which they were displayed, and Muybridge received correspondence from admirers internationally. On his mounts, Muybridge changed his title to "Landscape and Animal Photographer." The rapturous attention given the photographs prompted Muybridge to continue his experiments through 1879. However, the publicity garnered by the photographs created tensions between Muybridge and Stanford over who should receive credit for them which led to the dissolution of their partnership.

Muybridge and Stanford published competing compendiums of Muybridge's photographs. Muybridge widened the scope of his project to include other animals, including deer, dogs, cats, oxen and even humans performing various tasks. He assembled 203 of these in a handmade album he called *The Attitudes of Animals in Motion. A Series Illustrating the Consecutive Positions Assumed by Animals in Performing Various Movements Executed at Palo Alto , California, in 1878 and 1879*; it was published in 1881. The plates in this album exist in both albumen and printing-out paper versions. Stanford asked his friend the physician J.D.B. Stillman to write about the pictures, which resulted in the book *The Horse in Motion as Shown by Instantaneous Photography with a Study on Animal Mechanics* in 1882. In Stanford's book the original photographs were copied as lithographs, and Muybridge was not listed on the title page. He was mentioned merely as a skillful photographer. The publication of the book prompted Muybridge to sue Stanford, ending any hopes of continuing the project in Palo Alto. Stanford prevailed in court, mainly on the grounds that Muybridge could not lay claim to authorship as his work depended heavily on an electrical trigger mechanism designed by Stanford's engineer, John D. Isaacs.

Starting in the 1880s Muybridge spread his reputation by lecturing about his photographs in the United States and Europe. His presentations involved lantern slides made from his motion photographs, alternated with slides of historical representations (paintings, sculptures etc.) of animal motion. Muybridge pointed out inaccuracies in historical representations and the superiority of his technique. An important innovation he employed in his presentations was the zoopraxiscope, a projection device he invented in 1879 to show short animated loops of motion photographs. Because his photographs had been made in sequence, Muybridge reasoned that when shown in rapid succession they could easily be animated. This was a well-established principle of optical toys such as the phenakistiscope, but had not been perfected using photography. The zoopraxiscope combined a projecting lantern, rotating glass discs on which reproductions of Muybridge photographs were painted, and a counter-rotating slotted metal disk which spun at the same speed, acting as a kind of shutter. Contrary to popular belief, actual photographs were not used in the zoopraxiscope. Because it relied on a spinning disk with a counter-rotating aperture, the zoopraxiscope projected images that looked unnaturally short and squat. To compensate for this, skilled copyists were employed to paint the images on the disks in an elongated, stretched form so that when they were projected they returned to normal proportions. Nevertheless the illusion of animated photographs was convincing and inspired numerous other attempts to animate photography using a projector. For this reason Muybridge is often credited as one of the inventors of the motion picture.

Having severed all ties with Stanford, Muybridge approached numerous potential patrons to sponsor his continued investigations. The University of Pennsylvania finally agreed, giving him equipment and laboratory space on campus. From 1884 to 1886

Muybridge produced 781 motion studies under the partial supervision of Thomas Eakins, which he published in 1887 under the title *Animal Locomotion.* It became Muybridge's best-known work. The plates in *Animal Locomotion* were printed using the collotype photomechanical technique, although a nearly complete set of cyanotype proofs for the project is currently held at the Smithsonian Institution, National Museum of American History. Whereas in California Muybridge used trip wires to activate his shutters, in Pennsylvania he used a timer mechanism. This permitted him to photograph behaviours in which the subject does not proceed straight ahead at a constant rate. His equipment was markedly better than it had been in California. Equipped with thirty cameras which could be directed simultaneously at different angles, he was also able to take advantage of gelatine dry-plate chemistry, which was both faster and more convenient than the wet-plate materials used earlier. Although *Animal Locomotion* contains further photographs of horses and other animals borrowed from the Philadelphia Zoo, the primary focus was on humans. Men and women, nude or partially clad, are shown engaged in activities ranging from the banal to the highly esoteric: walking, running, and jumping are interspersed with dancing, smoking, and women pouring water over each others' heads. Of special interest are images made of people with physiological disorders, including an amputee, a pathologically obese woman, and a girl with multiple sclerosis. These photographs presage the diagnostic role photography would assume in scientific investigations, particularly under the influence of Etienne-Jules Marey and his colleagues in France. The volume was also highly influential among artists: subscribers to *Animal Locomotion* included the painters Lawrence Alma-Tadema, Ernest Meissonier, John Everett Millais, William Bouguereau, August Rodin, and James Abbott McNeill Whistler.

After *Animal Locomotion* Muybridge retired from photography and focused instead on lecturing and writing about his work. In 1893 he staged a zoopraxiscope theatre show at the World's Columbian Exposition in Chicago. It closed early due to tepid interest.

PHILLIP PRODGER

See also: Instantaneous Photography; Brady, Mathew B.; Morse, Samuel Finley Breese; Watkins, Carleton Eugene; Wet Collodion Negative; Dallmeyer, John Henry & Thomas Ross; Eakins, Thomas; Collotype; Cyanotype; and Marey, Etienne Jules.

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MYERS, EVELEEN (1856–1937)

English photographer

Eveleen Myers, née Tennant, was born in 1856 to Charles Tennant, an M.P. of Cadoxton, Glamorganshire, Wales, and his wife Gertrude, née Collier. In London, the Tennants were part of prominent artistic and literary circles. In 1880, Myers married F.W.H. Myers (1843–1901), psychical researcher and co-founding member of the Society for Psychical Research as well as writer and inspector of schools in Cambridge. The couple lived in Cambridge and had three children. Myers first began photographing to take portraits of her children in 1888, and she practiced photography, working in platinum, in the late 1880s through the early twentieth century. Her work consists of portraiture, artistic studies, and allegorical works. She photographed notable men and women, including Robert Browning and William Ewart Gladstone. These two portraits, along with *Rebekah at the Well* and *The Summer Garden*, are probably her best-known works and were reproduced in *Sun Artists*, Number 7, April 1891. Myers's photographs are in the collections of, among others, the National Portrait Gallery, London, and the Getty Museum. She died in 1937.

DIANE WAGGONER

N

NADAR (GASPARD-FÉLIX TOURNACHON) (1820–1910)

French photographer, writer, and caricaturist

To the question—"Who do you think is the world's greatest photographer?"—French essayist Roland Barthes provided a simple, one-word answer: "Nadar." And in the history of French photography in the nineteenth century, there are few who rival the artistry and output of this man who lived for eighty years of the nineteenth century and ten of the twentieth century.

Nadar's notoriety in photography came after successful careers first in writing and publishing and then in caricature. Based in Paris, Nadar met and communed with a large circle of late-Romantic artists and writers, as well as the radical social thinkers of the time. This circle considered itself bohemian and in opposition to anything bourgeois; it was politically and socially liberal and believed in the importance of art, personal integrity, and freedom of self-expression.

Photographic Beginnings

In 1854, although working at the time on his lithographic pantheon of contemporary "poets, novelists, historians, publicists, and journalists," Nadar offered to assist his younger brother Adrien in developing a new career. Nadar not only paid for his brother's lessons with Gustave le Gray, but he also managed to establish Adrien in his own portrait studio in Paris. It appears that it was always Nadar's intention to join Adrien in taking up photography; later that year Nadar commenced photography lessons with the firm of Adolphe Bertsch and Camille d'Arnoud. By September of 1854, however, Adrien's studio was failing to the point that Nadar felt compelled to step in and take control. Together the brothers made a small series of portraits, some of which were used to complete the portraits used in the *Panthéon Nadar*. Nadar also arranged for the studio's work to be exhibited at the Exposition Universelle of 1855.

By January of 1855 Adrien requested that the brothers separate, leaving Nadar to set up shop in his own residence at 113, rue Saint-Lazure. Adrien also adopted the name "Nadar jeune." Nadar had created his own name in 1838—a pen name (with a few variations) by which he was known his entire professional life. Beginning in 1855 (with appeals ending only in June 1859), a lawsuit was filed by Nadar to make Adrien cease and desist his use of the appellation "Nadar jeune." During those years Adrien did have some success as a photographer, while Nadar also established himself as a portrait photographer, becoming a member of the Société française de photographie in 1856 and winning a gold medal at the Exposition Photographie in Brussels in the same year.

Photographic Technique

In line with what he would have learned from Adolphe-Auguste Bertsch (who invented a faster and aesthetically finer collodion process for negative plates), Nadar's first prints were made from wet-collodion negatives on high-quality salted paper. By 1855 Nadar produced signed, mounted, salted paper prints: they measured 11 × 8¼ inches. Although disparaging of Disdéri's *carte de visite* format (Nadar considered it unaesthetic), by 1860 he had "submitted" to the raging fashion and was producing both full-size and *carte* prints (both salted paper and albumen, although the low-cost, commercially produced albumen papers would eventually prevail). From his earliest days as a photographer, it appears that Nadar manipulated his negatives in the darkroom; by the 1860s it is clear that he was retouching his negatives, making the retouching of prints rare. Nadar also experimented with artificial lighting not only for his portraits but also for his work photographing the Paris catacombs and sewers. He had always been a master at manipulating

natural light to aesthetic effect in his studio and soon abandoned electric light for his portraits.

Portrait Photographer

Nadar's turn to portrait photography appears to be a natural progression from his work in caricature. Already focused on capturing the essence of individuals' physiognomy through drawing and then mass producing the caricatures through lithography, Nadar possessed the aesthetic and interpersonal skills to use the medium of photography to its best advantage. Not only did he study with a photographer producing the finest-quality prints in Paris in 1854, but he also had a ready-made clientele, as well as name recognition. His circle of acquaintances was very broad, and many up-and-coming and established artists, writers, and social activists had already sat for Nadar. One of two extant albums that Nadar used for guests to sign when sitting for their portraits comprises over 400 names (with accompanying commentaries or samples of drawing, music, or poetry) of the most famous individuals working in music, art, poetry, fiction, politics, and the military in a twenty-year period between the mid-1850s and the early 1870s.

In 1876 Ernest Lacan—editor-in-chief of France's first photography magazine, *La Lumière*—evaluated Nadar's eminence in portrait photography: "His prints, their formats large for that period, had an entirely new look about them. Nadar generally worked in broad sunshine or at least lit his sitter in such a way that one side of the face was very bright and the other very dark. The pictures generally resembled what are today called 'portraits à la Rembrandt.' They were very artistic and enjoyed a great success" (quoted in Françoise Heilburn, "Nadar and the Art of Portrait Photography," *Nadar*, New York: Metropolitan Museum of Art, 1995, 36). Many scholars consider a mere six-year period from 1855 to 1860 to be Nadar's era of greatness in portrait photography. In 1860 Nadar undertook the construction of a new, large photographic studio at 35 boulevard des Capucines. Completed in 1861, it cost 230,000 francs, all of which Nadar borrowed. Financial considerations, therefore, and the popularity and economy of the *carte de visite* format forced Nadar to alter his original method of photographic portraiture. The results included smaller, less detailed prints as well as the miniaturization of his existing archive of prints (he re-shot original prints to create smaller negatives that would accommodate the *carte* format).

Typical of a Nadar photographic portrait is the lack of props or elaborate backgrounds. He also patented a technique in which the edges of the prints are faded. All attention centers on the subject, and most prints comprise only one individual. Nadar's subjects are never harshly cast, but they are not idealized either. In general, he de-emphasizes clothing, requesting that his subjects choose dark garments for their sitting. Nadar also de-emphasizes the subject's hands—frequently eliminating them from the shot or hiding them inside clothes or the folds of cloth. There is no one pose that Nadar adopts for his sitters. Some look left, some right—with eyes looking forward or with eyes looking down; some sit or stand and look directly at the camera, although most are posed standing or sitting at an angle from the camera. But as one scholar comments: "As Nadar is forced into rapid, high-volume production in the early 1860s [. . .] a bland, stereotyped portrait emerges [. . .] which relies on conventional dress and body language, flat lighting, and traditional studio props" (Ulrich Keller, "Sorting Out Nadar," *Nadar*, New York: Metropolitan Museum of Art, 1995, 86).

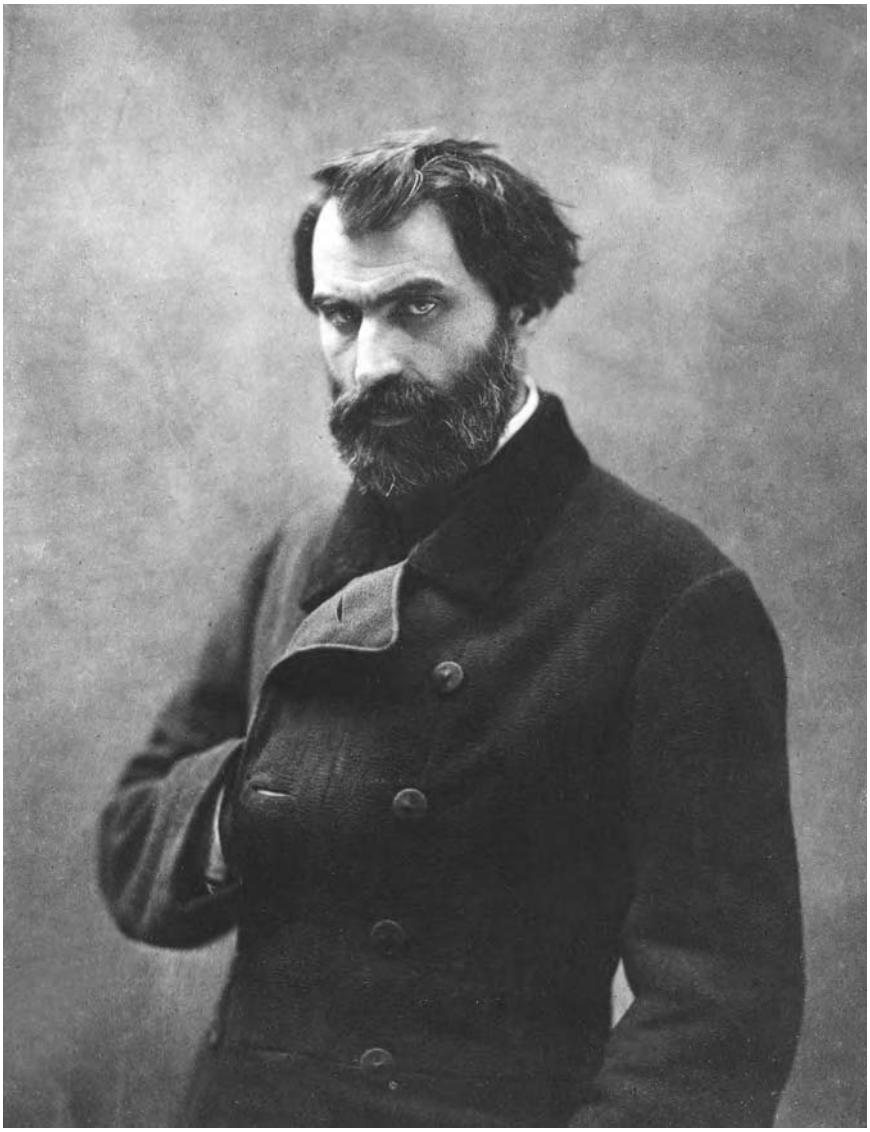
Among those photographed by Nadar are: Mikhail Bakunin, Théodore de Banville, Charles Baudelaire, Hector Berlioz, Sarah Bernhardt, Jules Champfleury, Gustave Courbet, Honoré Daumier, Eugène Delacroix, Gustave Doré, Alexandre Dumas (père and fils), Théophile Gautier, Edmond and Jules de Goncourt, Constantin Guys, Victor Hugo, Edouard Manet, Jules Michelet, Jean Français Millet, Henri Mürger, Gérard de Nerval, Jacques Offenbach, Pierre Joseph Proudhon, Gioacchino Rossini Rossini, George Sand, Giuseppe Verdi, and Alfred de Vigny.

Aerial Photography

In 1858 Nadar took his first aerial photographs from a balloon tethered near the Arc de Triomphe. He had actually attempted this endeavor the year before but was unsuccessful in making photographs, because the gases used in the balloon chemically interacted with his negatives. Nadar was a firm believer that the path to human flight lay with machines heavier than air, so he had his own balloon, called *le Géant* [Giant], built in 1863 in anticipation that the profits from its rides would generate enough income to build a helicopter. Between 1863 and 1867 he made five ascents in *le Géant* and remarkably increased his notoriety, but this adventure ultimately proved to be a financial disaster.

Subterranean Photography

In his quest for technological innovation and new pursuits, Nadar negotiated the right to photograph underground in Paris—first the catacombs in 1861–62, then the sewers in 1864–65. Victor Hugo had made the sewers famous in *Les Misérables*, and the catacombs fascinated such compatriots as Gustave Flaubert and the Goncourt brothers, all of whom toured the burial sites in 1862. Of course, the idea of going underground after having soared above ground seems only fitting. Although less



Nadar. Eugène Pelletan.
The Metropolitan Museum of Art, Purchase, The Howard Gilman Foundation Gift and Rogers Fund, 1991 (1991.1198) Image © The Metropolitan Museum of Art.

than pleased with the results of using artificial light in his portrait sittings, Nadar understood that electric light was absolutely necessary for underground photography; he represents the first photographer ever to attempt such a task. Using magnesium flares for light in the catacombs, Nadar needed to expose the negatives for upwards of 18 minutes. As a result, he decided to use mannequins rather than living humans to simulate workers (although at least one image exists in which Nadar himself appears). These staged images with their harsh lighting, nevertheless, represent a progressive experiment to push the boundaries of the medium and increase Nadar's fame as well. His work in the sewers a few years later was more problematic technically and yielded approximately two dozen images. They failed to capture the full extent of recent renovations, nor did they depict the ancient sewers described by Hugo. His power source entailed long wires attached to batteries that remained above ground.

Retirement

In 1873 Nadar purchased a home in the countryside outside of Paris where he and his wife Ernestine then spent most of their time. Political upheavals that included the fall of Napoléon III, the siege of Paris, and the subsequent Commune (itself overturned by the second siege of Paris) left Nadar physically, emotionally, and financially spent. He vacated his large studio on the boulevard des Capucines and relocated to small quarters in the rue d'Anjou. Interesting to note, however, is that Nadar allowed the Impressionist artists to mount their first exhibition in his old establishment on the boulevard for which he still held the lease. His son Paul now managed the business, although it was not until 1895 that Nadar formally turned over all rights to the name and all remaining partnership in the business. In his retirement Nadar began yet another career as a memoirist, which included the 1900 publication, *Quand j'étais un photographe* [*When I Was a Photographer*].

Nadar's final work as a photographer occurred in 1897 after his son failed to pay him his annuity: he opened a portrait studio in Marseilles but sold it in 1899. In 1900 Nadar was honored with a retrospective exposition of his work at the Exposition Universelle. The last decade of his life found him in failing health, although he survived both his younger brother Adrien and his wife Ernestine. Upon Paul Nadar's death in 1939, the Nadar studio ceased to exist.

NANCY M. SHAWCROSS

Biography

Born Gaspard-Félix Tournachon on 6 April 1820 in Paris, Nadar was the first child of printer/publisher Victor Tournachon and Thérèse Maillet. Originally educated in and around Paris, Nadar began but never completed the study of medicine in Lyons, where his father had relocated the family. In 1838 Nadar returned to Paris on his own and adopted "Nadar" (sometimes "Nadard") as his pen name. In Paris in the 1840s, Nadar allied himself with a band of vagabond artists that Henri Mürger immortalized in *Scènes de la vie Bohème* [Scenes from the Life of Bohemia]; among them was Charles Baudelaire. Nadar's first career was as a writer, but by 1846 he had embarked on a second career as a caricaturist, culminating in his 1854 tour de force, *Panthéon Nadar* (a revised version appeared in 1858), a set of two enormous lithographs comprising caricatures of noted Parisians. In 1854 Nadar also married Ernestine-Constance Lefèvre and assisted his brother Adrien by financing photography lessons for him with Gustave Le Gray and setting up a photographic studio, first for Adrien and then for himself. Though he continued to do caricatures throughout the 1850s, by the 1860s Nadar was an established portrait photographer in Paris, becoming a member of the Société française de photographie in 1856, exhibiting in its Salon in 1859, and pioneering a number of photographic techniques and locations, such as the first aerial photography and artificial lighting in 1858, equestrian photography in 1861, and photographing the catacombs and sewers of Paris in 1861–62 and 1864–65, respectively. In addition to these careers Nadar was also an aeronaut and financed a hot-air balloon called *le Géant* [*Giant*]. Nadar retired from photography in 1873, leaving his studio to his son Paul (1856–1939) to run. During his retirement Nadar continued to write and publish memoirs; he briefly re-emerged as a photographer in 1897 in Marseilles. Nadar died in Paris on 20 March 1910, fourteen months after the death of his wife.

See also: Le Gray, Gustave; Bertsch, Auguste-Adolphe; Wet Collodion Negative; Lacan, Ernst; *Cartes-de-Visite;* and Aerial Photography.

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NADAR, PAUL (1856–1939)

French photographer, entrepreneur, and son of Nadar

Paul Nadar was born February 8, 1856, in Paris, the only son of Ernestine and Félix Tournachon, better known as Nadar. Considered one of the premier portraitists of his time, Félix Nadar was celebrated for his *Panthéon Nadar,* caricatures of mid-to late 19th century Parisian cultural players, and his informal photographic portraits of these artists, writers, and performers.

Nadar's collodion-on-glass portraits were renown for their intimacy and details. As opposed to the work of contemporaries such as Disdéri, Nadar used minimal props. In lieu of elaborate backdrops and costumes, his subjects were shown in everyday clothing, either in frontal or three-quarter angle views. Mirrors, combined with natural and artificial lights, created dramatic shadows and framed his subjects in light, an effect intended to mirror their personal aura. Amongst the most intimate of Nadar's works were his photographs of Paul. In a celebrated work of 1856, the infant Paul is shown being fed by his wet nurse. Two years later, Paul is shown resting against the body of Madame Lefranc in a work that recalls late Italian Renaissance and Baroque images of the Madonna and Child.

By 1862, Nadar lost interest in studio photography, yet was forced to accept commissions from politicians and prosperous bourgeoisie. As a result, his celebrated aesthetic was often compromised as he, like most studio photographers, focused on lucrative *carte-de-visites*.

Nadar increasingly relied on studio assistants, who sometimes worked without him, to create his photographs. Despite the commissions, Nadar closed his studio on the fashionable boulevard des Capucines in 1871. That same year, he established a smaller practice at 51 rue d'Anjou. Run by his wife, Ernestine, this studio catered to a more affluent clientele and prospered. Paul, who had been trained by his father, acted as the artistic director, while Nadar pursued other interests. Paul became manager in 1874 and led the Nadar Studio in a different direction. While Nadar photographed wealthy clients in order to fund other projects, Paul actively sought such commissions, even photographing theater troupes and producing the occasional nude postcard to make the studio profitable.

Paul changed the celebrated Nadar aesthetic in order to accommodate this new clientele. Paul and Ernestine embraced conventional studio photographic props that Nadar despised, such as artificial backdrops, contrived poses, and elaborate furniture to create a more decorative style. Although the photographs show more generic expressions and less personality than in his father's portraits of his friends, this fashionable aesthetic catered to the new style and allowed the studio to financially prosper.

Between 1880 and 1885, Paul ran the Nadar studio. Because of his aesthetic and production methods, critics have portrayed Paul as less concerned with craftmanship than his father. Paul worked with gelatin instead of collodion negatives to increase the number of negatives and did not use salted paper or albumen for printing as Nadar had done. Therefore, when he reworked his father's glass negatives, his prints lacked the delicacy and degrees of tonality of the originals. In addition, he often altered Nadar's negatives, minimizing the rich backgrounds to make more pictorialist, and hence more fashionable, images. Although not actively involved in the studio, Nadar disapproved of these changes and, after years of fighting, father and son were estranged around 1885.

This estrangement proved to be brief as in 1886 the Nadars worked together on the celebrated *Entretien de M. Nadar avec M. Chevreul, le jour de son centenaire (M. Nadar Interviews M. Chevreul on his Hundredth Birthday).* Intended to illustrate scientific and technological progress, the photographs anticipated the photographic series and photojournalism. Originally made for the newspaper *L'Illustration*, eight of the twenty-seven photographs had a delayed debut on September 5, 1886, in *Le Journal Illustré*. Termed the first photo-interview, it was to be a conversation between the noted chemist and color theorist Eugène Chevreul and Félix Nadar on the former's birthday recorded by Nadar on a photophone and photographed by Paul using a camera with a roll-film attachment, which due to technical problems had to later be rewritten by Nadar.

In 1886, Paul Nadar took control of the Nadar Studio and began photographing from a hot-air balloon as his father had earlier, even photographing the infamous fire at the at l'Opéra Comique in 1887. He exhibited these works at the Société française de la photographie and was caricatured in the press as "The Fearless Paul Nadar" for his courage and his photographic experimentation. In 1890, Paul embarked on a trip across Europe and Asia to Turkestan following the ancient silk route. Paul acted as an early photojournalist, documenting his travels and photographing sites as diverse as bazaars, mosques, and desert landscapes. During his voyage, he worked with experimental new equipment from Eastman Kodak that used flexible films, which proved more portable and instantaneous than the standard glass plates. In 1893, he became the French agent for George Eastman and Eastman Dry Plate & Film Company, known as Eastman Kodak, and opened the first Parisian Office of Photography, which sold photographic equipment, including hand cameras, designed for amateur photographers.

Paul presented his work to prominent photography associations, including la Société Française de la Photographie and la Société des Hautes Etudes Commerciales. In 1891, he founded the journal *Paris-Photographe*, which, despite publishing prominent pictorials, was in financial trouble by 1894. The same year, he married Marie Degrandi, an actress at the Opéra Comique. In 1895, Félix Nadar officially transferred legal ownership of the Nadar Studio to his son, which he ran until his death on September 1, 1939. The Nadar studio, run by Paul's daughter, Marthe closed a few years after Paul's death. In 1950, Paul's second wife, Anne Nadar, sold the photographic collection, archives, and documents from the Nadar studio to the French government. The Caisse Nationale des Monuments Historiques et des Sites acquired about 60,000 negatives while the Bibliothèque Nationale acquired all prints, archives, and documents made by and concerning Félix and Paul Nadar. Discovered amongst the 400,000 glass negatives acquired by the Ministry of Education were Paul's photographs of Marcel Proust and his circle of friends and family members. In 2001, Anne-Marie Bernard edited a critically acclaimed book, *The World of Proust, as seen by Paul Nadar,* which featured a selection of these images.

Jennifer Farrell

Biography

Paul Nadar was born on February 8, 1856, in Paris. He was the only son of Ernestine and Félix Tournachon, better known as Nadar. Paul Nadar was trained in photography by his father, the celebrated portraitist. First as artistic director and later as manager, he ran his father's

third and final studio at 51 rue d'Anjou. Under Paul, the new studio catered to a more affluent clientele and prospered. As a photographer, Paul made fashionable images of the bourgeois and aristocratic clientele. In 1890, he began shooting from a hot-air balloon as his father had earlier. After these works were exhibited, he was caricatured in the press as "The Fearless Paul Nadar" for his courage and his experimentation with photography. In 1890, Paul photographed sites in Europe and Asia along the ancient silk route. He worked with new equipment from Eastman Kodak and, in 1893, he became an agent for George Eastman in France. He inherited the Nadar Studio after his father's death in 1910. The studio survived only a few years after Paul's death on September 1, 1939.

See also: Cartes-de-Visite; Collodion; Pictorialism; and Société française de photographie.

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NARCISO DA SILVA, JOAQUIM POSSIDÓNIO (1806–1896)

Joaquim Possidónio Narciso da Silva was one of the main 19th century Portuguese photographers. Particularly during the 1860s, he produced beautiful salt paper prints of Portuguese monuments, however he is best known as an architect and archeologist. His photography was, as a matter of fact instrumental to his research in architecture and archeology. Very young he went with the Portuguese Royal Family escaping from the Napoleonic invasions to Brazil. Latter, between 1821 and 1834, he studied and worked in France and Italy. He was a founding member of the Real Associação dos Arquitectos Civis e Arqueólogos Portugueses in 1863 and latter of the Museu Nacional de Arquelogia. Before that, in 1862–63 he published the illustrated magazine *Revista Pitoresca e Descritiva,* which, in several issues, presented 26 photographs as salted paper prints of some of the most important Portuguese monuments. As a photographer, as well as an architect and archeologist he promoted nationalism by means of knowledge of monuments and history. In 1875 he was a member of the commission charged of the reform of fine arts where he proposed the inclusion of photography in museums.

Nuno Pinheiro

NASMYTH, JAMES HALL (1809–1890) AND CARPENTER, JAMES (1840–1899)

James Nasmyth's place in the history of photography lies in the area of scientific illustration. He was a successful inventor who was able to retire in 1856 to pursue his interests as an amateur astronomer. Nasmyth had built his first telescope in 1827 and began to study the surface of the moon in 1846. He made a series of drawings recording his observations as photography was not yet able to record images under these conditions. These drawings received a medal when they were exhibited at the Great Exhibition in London in 1851. Nasmyth then constructed three dimensional models of the surface of the moon based on these drawings. These models were then photographed under conditions of bright sunlight to emphasis the contours of the terrain.

These photographs were of the special type used in the Woodburytype process. In the process of developing these special photographs, the lighter areas were rinsed away, leaving intaglio matrices. Lead was pressed into these matrices to form a relief and this relief was used to print the illustration in the book. The result was an image that more faithfully reproduced the continuous value gradations within the emulsion of a photographic print than the hatching technique of engravings. These Woodburytypes were published in a book titled *The Moon as a Planet, a World, and a Satellite* in 1874 in collaboration with James Carpenter, Nasmyth's friend and a professional astronomer associated with the Royal Observatory at Greenwich.

The creation of Woodburytypes was a cumbersome and time-consuming procedure. At the time, however, it was a practical medium for printing a photograph with a text. Tipping actual photographs into a text strained the limits of producing large amounts of positive prints from a single negative. The economic alternative of an engraving made from an original photograph allowed the intervention of the hand to subvert the objective value of photography as a mechanical imaging process which had been one of photography's most valued attributes from its earliest development.

The Woodburytypes maintained the integrity associated with mechanical imaging technology as objectivity was a central concern for science and scientific illustration. Thus the Woodburytype would have seemed to be the perfect medium for scientific illustration despite being cumbersome and expensive. It is ironic that Nasmyth's use of drawings and the construction of models, accepted practice in scientific research and publication, may be seen as subverting the very truth value of the photograph that made photography a valued tool for science. Nasmyth's models of the moon's surface reflected his desire to present "a rational explanation of the surface details of the moon which should be in accordance with the generally received theory of planetary

Nasmyth, James and James Hill Carpenter. Glass Globe. Cracked by internal pressure illustrating the cause of bright streaks radiating from Tyoho.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

formation." Some of the models were even designed to simulate volcanic activity, including eruptions. Theories of planetary formation were based on contemporary knowledge of the earth's geology and Nasmyth himself had observed volcanic activity during his travels. Yet the models involved the use of the hand in their construction, defying the advantages believed to be an inherent quality of mechanical reproduction.

The value of scientific illustration is based on an implicit faith in the processes of observation, reason, and representation. Theories of planetary formation were dependent on the reliability of the knowledge of the geology of the earth. This reasoning by analogy was based on the belief that similar effects had similar causes. Nasmyth applied this conceptual algorithm to a comparison of a dried apple and the back of a human hand. His reasoning was simple: similarities between the skin of the apple and the skin on the back of a human hand could be the product of similar subcutaneous phenomena. The evidence was supplied by the juxtaposition of photographic reproductions.

Naysmyth's faith in the objectivity of his drawings and his models was consistent with the scientific practice of the time. It was also consistent with his use of drawings and models when developing a new idea for a machine. Naysmyth was a very successful inventor. He was constructing miniature steam engines at the age of 17 and was commissioned by the Scottish Society of the Arts to create a steam powered vehicle capable of carrying up to six people in 1827. Nasmyth started his own business in 1834 at the age of 26 in which he successfully built steam engines and machine tools and, in 1839, drew sketches for the design of a steam hammer which he eventually patented in 1842.

Nasmyth's sketches and drawings represent the first stage in the concrete realization of an idea. The working models he constructed represent the second stage and demonstrate that his ideas do indeed work. The third stage is the manufacturing of the full-scale machine. In a move that was prescient for the time, he recorded these sketches in photographs as early as 1839 as record of and as proof that he had worked out the idea. There are no records of photographs having been made of the models or full-scale machines as if they themselves were the concrete documentation for the idea. In the case of the photographs of Nasmyth's models of the moon's surfaces, complete with simulated volcanic activity, one might conclude that the models themselves were the demonstration and proof of his ideas. The photographs and resulting Woodburytype illustrations were a means of making his ideas available to a wider public.

Nasmyth credited his ability to develop his ideas through drawings to the art instruction he had received from his father, Alexander Nasmyth. We can also trace his interest in mechanical reproduction, illustration and model making to the same source. Alexander Nasmyth used a *camera obscura* in his art instruction and created models when redesigning estates. The owners of the estates he painted often asked him to redesign their estates to more closely resemble the imaginative landscape paintings. Alexander Nasmyth was also considered the founder of the Scottish school of landscape painting and was also known as an artist.

KARL F. VOLKMAR

See also: Woodburytype, Woodburygravure.

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NASTYUKOV, MIKCHAIL PETROVICH (active 1860s–1880s)

Professional photographer

Mikchail Petrovich Nastyukov had his own studio in Moscow since 1862, and from 1869, he worked in the Nizshni Novgorod fair. His studio photo-portraits were always performed on a high technical and artistic level. Sometimes they were *cartes-de-visite*, and sometimes when rather large they were framed and served as a decoration. His studio was quite popular among the people of various social statuses and wealth. Nastyukov photographed painters, writers, actors, and others, and is proved by the considerable number of photographic portraits in existence. Unfortunately we know nothing about his private life, his friends or his environment. It is only known that in the 1860s he was under the patronage of His Highness Crown Prince Alexander (the future czar Alexander III). In 1869 Nastyukov created a group portrait depicting Prince Alexander with his wife and his retinue

The most outstanding of his works was the series of photographs of Volga towns. The series was in 1866–67 and then comprised an album under the title "Views of Volga from Tver' to Kazan'." The photographs glued upon passe-partouts were made by contact method from negatives sized 30–40 cm. It was one of the first important photographic series showing Volga's area.

Nastyukov was one of the first photographers to work outdoors on a large scale. This outdoor work was naturally hindered by considerable technical problems due to the fact that photographers of the time had only wet-collodion method at their disposal. The cumbersome camera, low sensitivity of photo-plate—all these limited the choice of scenes for photography. But the primary objective of any photographer was to break away from the concepts of painting forced upon the artistic value of photographs. For quite a long time photography had been viewed only as an auxiliary means for painting with the main function of recording reality.

Nastyukov made photographs of the monuments of architecture paying special attention to orthodox cathedrals—and they looked grand in his photographs. He was one of the first to start taking photographic chronicles of the Russian architectural monuments. This theme later attracted the attention of the Russian photographers. Nastyukov was in constant search of new images and objects, which is how he started making photographs of peasants from the neighbouring villages.

In the second half of the 19th century, the lives of peasants (with serfdom abolished only in 1861) was a burning issue, which found its reflection in the democratic art. The photographer combined architectural images with images of common people and their life. However technical problems prevented him from rendering life the way he wanted. So that his photographs would remain descriptive he built their composition through the use of the laws of painting.

In 1867, Nastyukov worked in Simbirsk, the town that attracted another outstanding photographer working in Russia, the Scots-born William Carrick, known in Russia as Vasiliy Andreevich Carrick.

In 1869, having accumulated enough experience in outdoor photography, Nastyukov accompanied the Great Prince Alexander Alexandrovich and his wife in their trip throughout Russia. This trip included a visit to the fair in Nizshni Novgorod and Nastyukov accompanied them as their photographer. For these photographs Nastyukov was awarded a bronze medal at All-Russia Polytechnic exhibition in Moscow in 1872.

Nastyukov, Mikchail Petrovich. The Church in Yaroslavl 1867.
Private Collection: Alexei Loginov.

Nastyukov also received the title of the photographer of His Highness Crown Prince Alexander (the future czar Alexander III).

In the 1870s, Nastyukov photographed the views of Moscow and its suburbs. In the village of Borodino, where in 1812 the great battle of the Russian troops against the army of Napoleon took place, the photographer captured images of the peasant life. In 1879, Nastyukov photographed the flood which took place in Moscow in April. The album of these photographs was given to the Moscow general-governor V. Dolgorukov. At the moment the album is in the collection of the State Russian Library.

In 1883, he made a series of photographs under the following title "Groups of foremen from all over Russia taking part in the celebration of crowning of the Royal Highness in May of 1883." This album is comprised of 512 portraits. It was purchased into the collection of the Emperor's Public library. Photographic ideas introduced by Nastyukov were taken up and developed by some other prominent Russian photographers, such as Andrey Karelin and Maksim Dmitriev.

Since 1865, Karelin worked in Nastyukov's studio. By that time Karelin was already fond of photography and had retouching experience. In Nastyukov's studio he learned the technology of the photographic processes during the time when Nastyukov was busy making photographs of Volga views. Karelin's works on Volga comprised his famous "Nizshni Novgorod" album. This experience would provide Karelin the knowledge to open his own studio in future.

In 1873 Maksim Dmitriev, who was then fifteen years old, became Nastyukov's apprentice. In Russia the adolescents were often taken to various workshops to study crafts. There they usually did hard work. In Nastyukov's studio, Dmitriev became exceptional familiar with the technology of the photographic processes. Once he became a well-known photographer, he developed his teacher's ideas in the album called "Volga series."

Nastyukov was a prominent figure in Russian photography at its start, but there are unfortunately very few reference sources on his life and work, most of them nowadays are lost. In the photographic circles of his time Nastyukow was considered an important photographer. Thus his failures were always noticed. In the beginning of the 1880s there came a new generation of Russian photographers. It was probably difficult for Nastyukov to compete with them. The last mentioning of his studio work to be found in literature is dated from the year 1883.

He was one of the pioneers of the full-scale outdoor photography. It is also worth mentioning that in his work he used and developed purely photographic expressive means.

Alexei Loginov

Biography

Mikchail Petrovich Nastyukov had a studio in Moscow since 1862. He worked at the Nizshni Novgorod fair since 1869. In 1866—67s he made an album of photographs called "Views of Volga from Tver' to Kazan'." Nastyukov worked in Simbirsk and Nizshni Novgorod, and acted as an accompanying photographer to the Great Prince Alexander Alexandrovich and his wife during their trip throughout Russia. Nastyukov received the title of the photographer of His Highness Crown Prince Alexander (the future czar Alexander III). Nastyukov was one of the first in Russia to successfully complete a full-scale outdoor photo-session employing purely photographic expressive means.

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NATTERER, JOSEPH (1819–1862) AND JOHANN (1821–1900)

The Natterer brothers belonged to a dynasty of Museums curators, which fostered their scientific activity, particularly in the Dienst der Naturalien-Kabinette des kaiserlichen Hofes, now the Naturhistorisches Museum in Vienna. Their grandfather had worked there, and their father Josef Natterer as well as his brother Johann Natterer (1787–1843), who traveled to Brazil.

Joseph and Johann Natterer began their career at the Institut as Assistenzkuratoren. Joseph and Johan were involved with photography for a short time, but during that time, they created a new photochemical sensitization process for the daguerreotype (iodine bromine chlorine mixture) around 1841. Their accelerated process, and a camera using the fast lens computed by Josef Petzval in 1840, resulted some of the earliest known "instantaneous" pictures (street scene with figures) with exposures of possibly less than one second. This innovation took place in the Fürstenhofrunde in Vienna, a club established by scientists, technicians, the medical profession, artists, and pioneers of photography. This club enabled the progressive orientation of photographic culture in Austria during the nineteenth century, which was extraordinarily important.

Maren Gröning

Biography

Joseph Natterer was born on 23 May 1819 in Vienna.

He did not receive special academic training. He began as Kustos Adjunkt" (Assistenz curator) at the Dienst der Naturalien-Kabinette des kaiserlichen Hofes (today the museum of Natural History in Vienna). From 1855 to 1858, he traveled Nubien (today the majority area of the Sudan) and Central Africa, where he acquired, among other things, animals for the imperial Menagerie in the park of Schoenbrunn, Vienna. He returned to Africa as an Austrian consulate representative to Khartum. He died on December 17, 1862 of malaria. Johann Natterer was born on October 13, 1821, in Vienna. He received his medical degree, but worked like his brother Joseph as an assistent curator) at the Dienst der Naturalien-Kabinette des kaiserlichen Hofes. Apart from his main profession as a physician (until 1874) and politician in the Viennese local council (1861 to 1879), he also worked as an inventor. In addition to the advancement of the Daguerreotype to instananeous photography, with the help of his brother, he created the construction of a compressor pump involving the liquefaction of carbonic acid, which set a new standard for the industry. He died on December 25, 1900, in Vienna.

See also: Austro Hungarian Empire, excluding Hungary; Societies, groups, institution, and exhibitions in Austria; Daguerreotypie; Moment photography

MAREN GROENING

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NATURALISTIC PHOTOGRAPHY

Naturalistic Photography was the term introduced by Peter Henry Emerson to describe both the aspiration for and practice of photography as a distinct form of art. Initially articulated in "Photography as a Pictorial Art," first in a lecture offered at the Camera Club of London on March 11, 1886, and later printed in *The Amateur Photographer* (March 19, 1886), it received full treatment in the manual, *Naturalistic Photography for Students of Art* (1889). Emerson offered a theory of art grounded in the principle that the finest art was that which was true to nature, and, more specifically, true to nature as perceived by the human eye. "Wherever the artist has been true to nature, art has been good. Whenever the artist has neglected nature and followed his imagination, there has resulted bad art" (Emerson, 1886). Further, the element that distinguished photography from other visual systems was its inherent truthfulness. From this core principle, he advised that for photography to be an art form it must be independent, not imitative, of other artistic forms, such as painting. "Truth to Nature" was achieved under his system of "Naturalistic Photography" when the photographer turned to nature for his subjects, rather than created tableaux that mimicked the subjects and compositional strategies of painting But more than the stipulation to photograph the subjects found in nature, Emerson decreed that in order for a photograph to be "truthful" it must faithfully incorporate the way in which the human eye apprehended the scene. In a long prologue, Emerson had argued for the congruence of art and science; one did not contradict the other and art must incorporate the knowledge derived from science. This had special relevance for photography and a theory of human vision. As a medical student, Emerson had followed the developments in achieving a scientific model of human vision and he was particularly persuaded by the physiologic mechanism of vision proposed by German physicist Hermann von Helmholtz in *Handbook of Physiologic Optics* (1867). Helmholtz described a visual mechanism in which the human eye registers in sharp detail only the limited portion of the visual field that it is directly focused on and attentive to, and that elements that are not within the area of focal interest are unsharp to a greater or lesser degree depending on their position relatively to the central area of focus. For Emerson, Helmholtz's theory of selective vision explained the lack of artistry he found in photographs that were disconcertingly sharply focused across the entire image. They did not represent truthfully the world as seen by the human visual apparatus.

Emerson translated Helmholtz's model into the practice he described as "differential focus," the intervention by the photographer, through choice of lens, to limit sharpness to a single point in the image while suppressing details in surrounding areas. The resultant photograph more closely accorded with the way that nature directly perceived would register in the eye.

> Nothing in nature has a hard outline, but everything is seen against something else, and its outlines fade gently into that something else, often so subtlely that you cannot quite distinguish where one ends and the other begins. In this mingled decision and indecision, this lost and found, lies all the charm and mystery of nature. (Emerson 1889, 150)

Emerson defined the equipment and procedures for achieving naturalistic photographs: a whole plate size view camera, a tripod, and most importantly, longer focal length lenses with the correct "drawing power" to render the scene in "natural" perspective with detail correctly distributed throughout the scene in accord with

natural human vision. He declared hand cameras a tool for amateurs and condemned enlarging, retouching, and, most vehemently, combination printing. He recommended printing in platinum—the Platinotype Company had introduced commercially prepared platinum papers in 1880—or in photogravure—an ink-based printing process. Both had the potential to produce a very long scale of contrast and soft tones with a delicacy of effect that was particularly suited to natural vision and differential focus.

Emerson positioned his theory of a photographic art based in science and true to the inherent qualities of both the photographic process and nature in opposition to the practice of art photography proposed by Henry Peach Robinson in *Pictorial Effect in Photography* (1869). Robinson stated that photography in order to attain the status of an art must combine both the real and the ideal, and that in the pursuit of this standard the photographer must compose as did painters. In practice, this meant planning and organizing the picture through sketches and studies, and translating the pictorial ideas into photographs through the use of subjects posed and lighted to emulate paintings. Frequently the results were large, complex prints built up from a number of negatives. Robinson's vision of photographic art was highly constructed and artificial. Emerson articulated his theory—in lectures, articles, and his book, and in a series of combative letters to photographic journals—as diametrically opposed to a bankrupt and ill-considered practice that had no artistic merit. Although Emerson's position on photographic art is generally presented as oppositional to Robinson's, it should be recognized as a continuation of contemporary discourse on naturalism in art. Ideas of naturalism in painting had been articulated by Francis Bates, "The Naturalistic School of Painting," in 1886 and by Thomas Goodall with whom Emerson collaborated on *Life and Landscape on the Norfolk Broads*.

Illustrating his theory of naturalistic photography, Emerson produced a number of photographically illustrated books and folios in platinum and photogravure: *Life and Landscape on the Norfolk Broads* (1886); *Pictures from Life in Field and Fen* (1887); *Idyls of the Norfolk Broads* (1888); *Pictures of East Anglian Life* (1888); *Wild Life on a Tidal Water* (1890); *On English Lagoons* (1893); and *Marsh Leaves* (1895). In his work, he returned again and again to the watery fens of eastern England, recording scenes of ancient rural rhythms. Emerson's use of differential focus in photographs printed in soft Platinotype or as photogravures captured a very personal visual experience of a natural order uniting land and people. In point of fact the fens were changing under the pressures of drainage and land recovery schemes and the onslaught of modern tourism. The self-professed proponent of an equivalently scientific and artistic view of nature in photography created a romantic and nostalgic record of a vanishing way of life.

In 1891 Emerson reversed himself and acknowledged that one could not attain in photography the degree of expressive control necessary for it to be defined as an art. In 1895 he published a pamphlet the title of which, set on a black bordered page, proclaimed *The Death of Naturalistic Photography: A Renunciation*. His reading of recent scientific studies on the chemical processes in photographic development had convinced Emerson that the photographer could not control the tonal values of a print through the development process to the extent that he had assumed. He concluded that the degree of chemical determinism meant that photography could not be an art.

> The limitations of photography are so great that, though the results may and sometimes do give a certain aesthetic pleasure, the medium must always rank the lowest of all arts.…Control of the picture is possible to a *slight* degree, by varied focusing, by varying the exposure (but this is working in the dark), by development, I doubt (I agree with Hurter and Driffield, after three-and-a-half months careful study of the subject), and lastly by a certain choice in printing methods. But the all vital powers of selection and rejection are *fatally* limited, bound in and fixed by narrow barriers. (Emerson 1895, n.p)

Despite his rejection of the scientific basis of photography as an art, he continued to make and publish photographs. *On English Lagoons* and *Marsh Leaves* were both released after his repudiation of photography as an art. In 1898 he published a third and revised edition of *Naturalistic Photography* which was substantially the same as earlier editions—the same description of the technique for and justification of differential focus, the same stipulations regarding equipment, the same prohibition on enlarging and darkroom manipulation, the same guidelines for photographic printing. The most significant change was in the final chapter now titled, "Photography—Not an Art."

Despite Emerson's rejection of his position, Naturalistic Photography had a lasting effect. He had articulated a position for photography as an art form based on the inherent attributes of photography and its intimate connection with the natural world. If he had disavowed his insistence on the scientific basis of his theory of photographic practice, he had not disavowed his pugnacious criticism of previous practitioners of art photography. His stipulation to adhere to photographic principles and to use the camera in the natural world influenced succeeding generations. His luminous prints stood as exemplars of what could be achieved with the direct depiction of visual experience.

KATHLEEN STEWART HOWE

See also: Robinson, Henry Peach; and Hurter, Ferdinand, and Driffield, Vero Charles.

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NAYA, CARLO (1816–1882)

Italian photographer and studio owner

Carlo Naya was born at Tronzano di Vercelli in 1816. He studied law at the University of Pisa. Thanks to an inheritance, he travelled extensively, visiting the most important cities in Europe, Asia and Northern Africa. In 1857 he settled in Venice where he opened a studio as a photographer. He became very well—known for his views of the city's monuments and works of art. His photographs were sold by Carlo Ponti, a photographer and seller of engravings and optical instruments. Naya collaborated with other Venetian photographers to produce an album of views of Venice in 1866, when the Venetian Republic was annexed to Italy. He then opened a studio at Procuratie Nuove which was visited by artists, scholars and tourists. He took photographs of Giotto's frescoes in the Scrovegni Chapel in Padua, in 1864—1865 and in 1867, to document the restoration works. He won many awards: the Great Medal at the Universal Exhibition of London (1862); gold medals at the Exhibitions of Groningen (1869), Trieste and Dublin (1872). He died in Venice in 1882. His wife, Ida Lessiak, was left in charge of the studio. She died in 1893 and her second husband, Antonio Dal Zotto, took over the atelier. On his death, in 1918, the studio was closed and the main part of the photographic archive was bought by the publisher Osvaldo Böhm.

SILVIA PAOLI

NÈGRE, CHARLES (1820–1880)

French photographer and painter

A successful academic painter, Charles Nègre turned to photography in the 1840s and elaborated an aesthetic of intimate, highly subjective compositions that suggested moments seized from everyday life. He produced some of the first photographic genre studies and street scenes and sought to imbue the photograph with an emotional immediacy that contradicted its reputation as a dispassionate product of science. "Photography is not a remote and barren art," he explained. "[It] does not destroy the personal feelings of the artist" (Rouillé, 133).

Nègre was born in Grasse, France on 9 May 1820, the first of four children to the owners of a confectionery business. Rather than join the family enterprise, Nègre embarked on an artistic career, taking drawing lessons

Naya, Carlo. Acquedetto di Venezia (nuova condotta). Cantiere dell' Argine. Arrangement of the aqueduct of Venezia.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

from Sébastien Pezetti of Aix-en-Provence while in high school. His father encouraged Nègre's ambitions, helping send him to Paris in 1839 to apprentice in the studio of Paul Delaroche. Delaroche was one of France's most distinguished painters and an early advocate of photography, counting among his apprentices the the budding photographers Gustave Le Gray, Roger Fenton, and Henri Le Secq.

In 1841 Nègre entered the Ecole de Beaux-Arts and in 1843 he briefly worked in the studio of Michel-Martin Drolling before moving to the studio of Jean-Auguste-Dominique Ingres, where he remained for several years. Beginning in 1843, he exhibited historical and mythological paintings at the annual Salon in Paris, and continued to exhibit there on and off until 1864**,** well after he had become better known as a photographer.

Nègre first attempted photography by making daguerreotypes in 1844 as an aid to his painting, but by 1848 he had moved to the calotype process for the greater aesthetic flexibility offered by its paper negative. Nègre would modify the negative with ink or pencil as well as adjust printing methods to meet his artistic intentions. While his first photographs were primarily model studies and studio portraits, he soon broadened his scope to produce action scenes of working people taken from the streets of Paris. From chimney sweeps to itinerant musicians or vendors at the market, Nègre sought formally challenging but unified images of harmonious effect, reminiscent of the Flemish and Dutch Masters he much admired.

These genre scenes had an immediate impact on the emerging photographic community. "The Little Rag-Picker" (1851), an image of an exhausted boy resting beside his heavy basket, was deemed "no longer a photograph" but rather "a thoughtful and intentional composition" by contemporary critic Francis Wey. Although those terms do not seem mutually exclusive, the comment underscores the early perception of the photograph as merely a mechanical exercise inconducive to producing pictorial harmony.

Nègre devised a series of lenses to allow for the very short exposure times required to capture these scenes, and while the bustling participants in his market scenes blurred slightly, each is readily distinguishable at his or her task. It was his "Chimney-Sweeps Walking" (1852), however, that attracted the most praise for delivering a sense of arrested movement. As Nègre carefully posed his three subjects in simulated stride it was not an image of motion as such, but of an effect that testified to the artist's technical and compositional capabilities. While he occasionally incorporated elements from these photographs in his Salon paintings, he also mounted and signed the prints as finished works in their own right.

By the early 1850s, Nègre was searching for ways to live as a professional at his photography without resorting to the common, stultifying choice of studio portraiture. Encouraged by the government's 1851 Mission Héliographique [Heliographic Mission], which had employed his friend Le Secq and others to photograph historic monuments, Nègre spent the summer of 1852 documenting the landmarks of his native Midi region. Although he had hoped to publish a comprehensive album of these photographs, he managed only two installments in 1854 before the project ran aground. A project to photograph all of Paris' landmarks, which occupied him for three to four years in the mid-1850s, met a similar fate. However, one image from that series, popularly known as "Le Stryge" [The Vampire] (c.1853), was a success upon exhibition and has become an icon of 19th-century photography. A striking hybrid of Romanticism and modernity, it depicts Le Secq haughtily posed in his top hat among the grotesque sculptures decorating the parapet of the cathedral of Notre Dame, from which he surveys the urban sprawl like a cosmopolitan demigod.

Nègre's two excursions to Chartres—in 1851 and around 1854—illustrate the evolution of his landscape and architectural work. During his first visit with Le Secq, Nègre produced idyllic, pastoral village scenes embodying the picturesque style he had learned while an art student. The photographs from his second visit, however, are much larger and concentrate on the city's famous cathedral, emphasizing symmetry and monumentality. Influenced by the photography of Le Secq and Edouard Baldus, Nègre approached the building like a sculptural text to be read in parts, privileging clear information over sentiment and mood. Despite his stylistic adjustments, Nègre struggled to win government commissions and, perhaps out of desperation, wildly proposed making a photographic catalog of the history of man, a suggestion that earned him only a modest contract photographing selected works in the Louvre.

It was in 1858, on one of his final projects, that Nègre reconciled his talent for capturing small genre scenes with the more grandiose demands of public photography projects. Asked to document a new imperial asylum erected in Vincennes to house disabled workers, Nègre favored large plates to depict the complex's exterior, but reverted to smaller plates (requiring shorter exposure times) to capture the interior scenes of employees at their tasks. These contemplative compositions of cooks, pharmacists and nurses present labor as simple yet ennobling and reflect Nègre's belief that a combination of "observation, sentiment and reason reproduces effects that make us dream, and simple motifs that move us." In "Vincennes Imperial Asylum: The Linen Room" (c.1858), sunlight falling gracefully on a nun folding sheets turns her endeavor into a gesture of quiet splendor worthy of Vermeer.

A founding member of the Société héliographique

Nègre, Charles. A Street in Grasse, Montée de Fontlaugière.
The Metropolitan Museum of Art, Purchase, Jennifer and Joseph Duke Gift and Chairman's Council Acquisitions Fund, 2000 (2000.286) Image © The Metropolitan Museum of Art.

[Heliographic Society] and the Société française de la photographie [French Photography Society], from his first daguerreotype experiments Nègre was deeply involved in promoting photography and contributing to its technical improvement. From 1854 to 1867, in an attempt to capture the generous De Luynes prize for the advancement of photogravure, he perfected a process that used gilding via galvinoplasty to increase tonal ranges in prints. Though he lost the competition, he was invited to present his results—first patented in 1856—at industrial exhibitions throughout Europe.

His health failing, Nègre returned to his native Midi in 1863, finding work as a high school drawing instructor and opening a commercial studio in Nice. He continued to promote his photogravure process through writings, lectures and exhibitions, but was never able to parlay his efforts into commercial success beyond a small series of photogravures of Chartres cathedral assembled for the government in 1858 and a contract to produce the plates for the Duc de Luynes' book, *Voyage à la Mer Morte* [Voyage to the Dead Sea] in 1871.

Nègre's photographs from his Nice years were limited to standard carte-de-visite portraits and Riviera views intended for the tourist trade. When he died in Grasse on 16 January 1880, his career had fallen into obscurity, his photogravure process having long been forgotten and the emerging dry-plate process making motion photography a banal affair available to all with a camera. It was only with the exhibition of selections from his personal archives in the 1960s and 1970s that his reputation was reestablished.

STEPHEN MONTIERO

Biography

Charles Nègre was born on 9 May 1820 in Grasse, France. He studied at the Ecole des Beaux-Arts in Paris, apprenticing in the studios of Delaroche, Drolling and Ingres. He exhibited paintings at the annual Salon in Paris on several occasions between 1843 and 1864 and was appointed drawing instructor at the Ecole Supérieure du Commerce [Higher School of Business] in Paris in 1852. He took up photography in 1844 as an aid to his painting. Particularly known for his genre studies, he also made extensive photographic surveys of the Midi region in 1852 and of Paris landmarks during the mid-1850s. In 1858 he undertook a government commission to photograph selections from the Louvre collection, followed by a commission to photograph the Imperial Asylum in Vincennes in 1859. He exhibited his photographic work in over two dozen exhibitions throughout Europe, including the exhibition of the International Society of Industry in Amsterdam in 1855, the Universal Exhibition in Paris in 1855, 1863, 1867, 1868 and 1878, the French Photography Society exhibition in 1855, 1859, 1861 and 1864, the International Exhibition of Industrial Arts in Brussels in 1857 and 1861 and the Universal Exhibition in London in 1862. He patented an improved photogravure process in 1856. In 1863 he moved to Nice, where he opened a commercial studio and taught drawing at the Lycée Imperial [Imperial High School] until 1878. He died in Grasse, France, on 16 January 1880.

See also: Delaroche, Paul; Le Gray, Gustave; Fenton, Roger; Le Secq, Henri; Daguerreotype; Calotype and Talbotype; Mission héliographique; Baldus, Édouard; Société héliographique Française; Société française de photographie; and Photogravure.

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NEGRETTI AND ZAMBRA (1850–1899)

Optical instrument firm

Negretti & Zambra was established in 1850. Of the two partners, Henry Negretti and Joseph Warren Zambra, the former is by far the better documented and became known as "one of the pioneers" of British photography through his improvements to apparatuses and through his marketing of high-quality stereoscopic views.

Enrico Angelo Negretti was born on 13 November 1818 in Como, Italy. Leaving home at an early age, he had arrived in England by the time he was twelve years old and became apprenticed to Francis Augustus Pizzala at nineteen. By 1839 he set up his own establishment as a glass blower; after a brief partnership with the widow of another glass blower and barometer maker, by 1845 he was again in business for himself, soon expanding to include a range of philosophical instruments and running two branches, at 19 Leather Lane and 9 Hatton Garden. On 1 July 1845 he married Mary Peet, who subsequently worked in the firm; the couple had five children, of whom three survived their infancy.

On 24 April 1850, Negretti entered into partnership with Joseph Warren Zambra, born at Saffron Waldon in 1822 to an English father and an Italian mother. Negretti & Zambra seized the opportunity to promote their wares at the Great Exhibition of 1851, where they won a prize medal for glass instruments shown in Class 10, "Philosophical instruments and their dependent processes," the same category that featured several photographic apparatuses, such as an early stereoscope constructed by Louis Jules Duboscq. Following their success at the Crystal Palace, Negretti & Zambra were named meteorological instrument makers to the Queen, but they soon became better known for their stock of equipment relating to the daguerreotype, calotype, and collodion processes—cameras, glass plates, head rests, tripods, dark tents, frames, and chemicals. When the Crystal Palace re-opened in Sydenham in 1854, Negretti & Zambra were appointed official photographers and a year later sent a team of operators, including Philip Henry Delamotte, to produce a number of instantly popular images of Queen Victoria's reception of Napoleon III and the Empress Eugénie.

As business grew, the company moved to larger and more numerous facilities: 59 Cornhill (1860–72), 1 Hatton Gardens (1860–69), 107 Holborn Hill (1860–61), 122 Regent Street (1862–76), 153 Fleet Street (1865–73), Holborn Circus (1870–76), Charterhouse Street (1870–76), 45 Cornhill (1873–76), Crystal Palace, Sydenham (1883–99). The last-named establishment

was among London's first portrait studios to feature electric lighting.

Negretti & Zambra became best known as publishers of stereoscopic views. By the 1860s their catalogue included interiors of the Crystal Palace; genre scenes; views of Europe, America, and India; and Claude-Marie Ferrier's instantaneous transparencies on glass. The landmark series depicting the Near and Far East were eagerly anticipated and exceptionally well reviewed. The first of these, *Stereoscopic Views in the Holy Land, Egypt, Nubia, &c.*, with negatives by Francis Frith, appeared in 1858; followed by *Stereoscopic Views in China* in 1859 and *Scenes and Scenery in Java* in 1861, photographed by P. Rossier and Walter Bentley Woodbury, respectively. Contrary to contemporary reports, Negretti & Zambra did not typically commission and finance a photographer to undertake an expedition, but would purchase the negatives and assume all costs of production and distribution. These could be considerable, as in the case of the views of Japan, which featured high-quality mounting and packaging in a Japanese style, as well as special stereoscopes made to the firm's order in Japan and bearing Japanese-style decorations. Sales were very brisk, although undercut by poor-quality pirated versions.

Negretti & Zambra were responsible for innovations in several other areas of photography. In 1855 they sold packets of albumen glass plates guaranteed for one month in the attempt to popularize this process (though ultimately albumen-on-glass did not compete with collodion wet plates); in 1858 they marketed an advanced oxy-hydrogen (or limelight) magic lantern capable of magnifying a projected image to 40 feet in diameter; and in 1868 they sold an early bellows-style pocket camera designed by C.D. Smith. The firm were also pioneers in the field of photographically illustrated books and the reproduction of works of art: they produced the prints, reduced from 3-foot-square negatives, were tipped into Richard Henry Smith's *Expositions of the Cartoons of Raphael* (London: J. Nisbet, 1860) and *Expositions of Great Pictures* (London: J. Nisbet, 1863). Negretti & Zambra won a prize at the International Exhibition of 1862 for the series of 100 stereographs Frith made during a second trip to the Holy Land, published as *Egypt, Nubia, and Ethiophia* (1862), with a text by Joseph Bonomi and Samuel Sharpe, and sold with a folding stereoscope for 3 guineas. A photographic venture of Negretti's that seems not to have a commercial motivation was his flight in a balloon to take aerial photographs, accomplished on 28 May 1863, five years after Nadar's famous flight ascent in France.

A charismatic and energetic man, Negretti enjoyed a public profile, especially among the Italian community. He hosted Garibaldi when he visited London in 1854 and ten years later served as chief of the reception committee that greeted the now-famous Italian patriot. In 1864 Negretti intervened in a high-profile murder investigation, saving the innocent Serafino Pelissoni from the gallows by proving that Pelissoni's cousin Gregorio Mogni was in fact guilty of the crime. For this he received a knighthood from King Victor Emmanuel. In his last years Negretti spent time in Como, but he died at his Cricklewood home on 29 September 1879. Zambra survived him by eighteen years, dying at his home in Hampstead on 23 December 1897.

Negretti & Zambra's success was such that in 1861 the *Art Journal* credited them with completing "what we might entitle a stereographic *cordon* in and about London." But because the firm did not specialize in subsequent decades, by 1879 it as not, as the *British Journal of Photography* noted, quite as well known as it had been. The last commercial branch closed in 1899.

BRITT SALVESEN

See also: Books illustrated with photographs: 1850s and 1860s; Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); Delamotte, Philip Henry; Frith, Francis; Rossier, Pierre; and Woodbury, Walter Bentley.

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NEKHOROSHEV, N. (active 1870S)

N. Nekhoroshev worked in Tashkent. He was the author of *The Turkistan Album* published in 1871–72 in six copies and divided into three parts: *The Ethnographic Album*, *The Crafts Album*, and *The Historical Album*. One of these copies made its way to the Emperor Alexander II.

The Ethnographic Album consisted of two volumes and included the following types of photographs: national types of the Turkistan Territory, views of towns and villages, images of clothing, utensils, and musical instruments.

The Crafts Album included photographs of local industries.

The Historical Album included portraits of the Russian military men photographed in action during the military expedition to Middle Asia and also included landscapes and views of the Turkistan Territory from the numerous fortresses.

The Turkistan Album was a main and monumental photographic work in Russia during those times. No other Russian territory was so systematically and completely photographed as the Turkistan Territory was because of Nekhoroshev's photographs. The greatest value of the album was the fact that the life of the territory's nations was photographed from nature. The leading Russian art critic V. Stasov expressed his high praise and opinion of the album. He found the photographs therein valuable, and not just to the sphere of documentation and ethnography, but to Russian culture as well. Stasov mentioned that "each photograph is a really folk image…truly and picturesquely showing the Turkistan customs and life."

ALEXEI LOGINOV

NETHERLANDS

The invention of photography was announced in The Netherlands as soon as in other countries; newspapers and magazines reported on it in 1839, especially after the first public demonstrations of the process in Paris. The first Dutchman to take up a camera was the Amsterdam painter and dealer in artists' materials Christiaan Julius Lodewijk Portman (1799–1868), who exhibited three daguerreotypes (maybe a few more) at an art exhibition held in October 1839 in The Hague. Some of these were made in Paris—where he is supposed to have acquired equipment for making daguerreotypes—some in Amsterdam and The Hague. Portman's daguerreotypes are unknown nowadays and it is uncertain whether he took up photography as a way of earning money or as an interesting experiment. It was probably he who translated into Dutch one of Daguerre's manuals; it was published in a magazine, not separately. After the first few practitioners had come and gone and many an article had been published in newspapers and magazines in 1839, photography seemed to slip out of public notice for about two years. In 1842 a number of itinerant photographers took up the medium. Well into the 1850s most photographers travelled from one city to the other, often staying only a few days. Setting up a temporary studio in a hotel, an inn or at a private house, they sometimes showed specimens of their work in the shopwindows of local art dealers. Judging by their names, most of these itinerant photographers seem to have been French (or Belgian). However, it was recently discovered that the best known of these, Edouard François, who in his newspaper advertisements implied that he was Parisian, was actually a young Dutchman, Eduard de Prouw. He took on a French name to make a better impression onto his clientele: all things French had a good reputation in those days. Moreover, the pseudonym suggested he had been trained in one of the main centres of photography. Instead of returning each winter to Paris, as his newspaper announcements suggest, he lived in the Dutch capital all his life. Due to the fact that only in the other seasons was there sufficient light to make photographs, he was only active as a photographer part of the year, practising another (unidentified) job in winter. Those who really came from abroad sometimes visited The Netherlands as part of a larger journey from France and/or Belgium to the north west of Germany. For instance, Louis Lumière, who was the second person known to have been working as a daguerreotypist in The Netherlands—he demonstrated the process in the Hague in November 1839—was also active in Ghent and Antwerp (October–November 1839) and in Bremen (January 1840). He is believed to have been a Parisian merchant, but his name is not to be found in the literature of early French photography. The same applies to the others who visited The Netherlands: A. Derville (1842), F. la Moile (1848–1850, 1852–1853), and Louis Schweig (1846, 1853). Besides foreigners, Dutch photographers also travelled the country. Most of these earliest photographers are known to us mainly through advertisements and articles in the press, rather than through their works, which have either not survived or are unidentified today.

The earliest photographer from whom a significant body has survived is the Amsterdam amateur Eduard Isaac Asser (1809–1894), a lawyer by profession. Some fifteen daguerreotypes and four albums with about 200 prints were kept in the family until recently, when the whole collection was transferred to the Rijksmuseum in Amsterdam. Asser often directed his camera towards his family and friends and also photographed quite a few still-lifes and cityscapes. Only a few of Asser's photographs are dated, but he seems to have made most of them in the first half of the 1850s. The photographs in the four albums especially introduce us into the world of a well-to-do Amsterdam family. Unfortunately, Asser did not caption the prints, nor did he leave any written account of his working methods or aesthetic considerations. Some of his portraits have a charm and liveliness that is lacking in most portraits made by professional photographers. As far as we know, Louis Wegner (1816–1864) was the only professional photographer who did portraits in a "grand manner" in the 1850s. A series of four rather large portraits he made of the painter Nicolaas Pieneman is noteworthy.

From the late 1850s onwards, most professional photographers set up a permanent studio instead of

travelling around. This must be due to a growing number of clients, especially after the introduction of the carte-de-visite around 1860. One of the very first to realise the commercial viability of the carte-de-visite was Maurits Verveer (1817–1903), who established himself in The Hague in 1857. From 1861 he launched a rather large series of portraits of "Tijdgenooten in Kunsten en Wetenschappen" (contemporaries in the arts and sciences). Amongst them were writers, painters, university professors, and clergymen. A contemporary comment on Verveer's portraits suggests that—in general—clergymen and low-necked danseuses sold best. The habit and fashion to exchange carte-de-visite portraits is demonstrated by the diary of the Danish writer Hans Christian Andersen, who, during a stay in The Netherlands in 1866, gave away many copies of his portrait and received a similar number in return from people he met. As in other countries, it was a hobby to collect such portraits and to put them in an album specially designed for that purpose. Very often, such an album would begin with royal persons, followed first by other famous people and then by acquaintances of the one who compiled the album.

Professional photographers depended almost completely on the making and selling of portraits, both of well-known persons and of individuals who wanted a (half) dozen of their portraits to circulate among their friends and relatives. All other subjects—topographical views, art reproductions, the construction or demolition of buildings—were comparatively marginal. Pieter Oosterhuis (1816–1885) was one of the very few who closed down his portrait studio—he did so in 1869—to concentrate upon photographing the construction of railways, canals, breakwaters, bridges, sluices and other public works. In the second half of the 1850s he had already started making a great many stereoscopic views in Amsterdam and other towns. The latter survive in rather large quantities, so they must have sold well. Commissions for photographs of public works probably paid handsomely, otherwise Oosterhuis would probably not have taken the decision to close down his studio. He seems to have been the only photographer whose commissions were located throughout the country, whereas in most cases a commission was awarded to a local photographer.

Most of his colleagues, however, stuck to portraiture. In Amsterdam their number rose from six in 1851 to about sixty by 1899. The Hague and Rotterdam followed: in these cities about fifty and about fourty photographers respectively were active in 1899. Judging by the occupational censuses that were held three times in the 19th century, most studios, especially in the smaller towns, were rather small: in 1889 and 1899 the average photographer had only one assistant. The actual number of people working in a photographic studio may have been a little higher, as it is likely that in many cases the photographer's wife and/or children worked there, too, without being counted in the census. Contrary to what is regularly asserted in the literature of Dutch photography, the carte-de-visite was not within everyone's reach: many people did not earn enough to be able to afford the relative luxury of having themselves photographed or collecting pictures of famous people. A set of twelve cartes-de-visite usually cost about four or five Dutch guilders in 1865—c. 30 to 35 Euro in today's money. That was simply too much for the lower classes.

In the first two decades, photographers often took on other jobs, in order to earn a living. Like in any profession, some became quite prosperous, while others never escaped poverty. Research into assessment-lists that have survived suggests that since the 1860s most photographers managed to be independant from other jobs and earned a decent living. A popular assumption is that many photographers originally were second-rate painters who changed their profession to earn more money. In fact, only approximately one-third of the professional photographers had a background in the arts (painting and engraving, especially), while a similar number came from commerce and handicraft. Those who had started as artists did not always completely give up their original profession, but sometimes practised the two at the same time. (It is the same with printing firms, which continued to produce engraving or lithography, but took up photographic printing as an extension of their activities.) Although some photographers reached prosperity, only some of them formed part of the cultural or social elite. Societies or clubs counted few photographers among their members, with the exception of artists' societies, of which many photographers were still members even if they did give up their former artistic occupation. Photographers are seldom mentioned in letters, autobiographies and other material that might otherwise have given some information on what kind of people they were and how they were looked upon. The social standing of photography was not very high, and, assuming that in the 19th century most people still married within their own class, the professions of their fathers-in-law may serve as an indication as to which kind of occupations photography was mostly associated with. Most brides were the daughters of working men, craftsmen, and tradesmen; they nearly all had a lower or middle class background. Apparently these were the classes in which photographers belonged.

Throughout the 19th century there was no other way to learn photography than to be trained by an accomplished photographer. Until 1942 photography was a profession that could be practised without a license, i.e. the obligation of having finished some official education. Although there were occupations easier to enter

or to master (requiring less financial investments and technical-chemical skills), there may have been some charlatans in photography, many of whom were active at fairs or still wandering from one small town or village to another. Several photographers complained about these less appreciated "colleagues." (Sometimes a photographer would accuse a rival of being a quack, evidently one of the worst insults one could think of.) It is not unlikely, however, that these complaints were mainly prompted by the wish of established photographers to be accepted as full-fledged citizens or even artists. As it has already been pointed out, the photographer's social status still left much to be desired.

On the one hand, feeling superior to people who made their money on fairs or by roaming around, photographers must have felt much less secure about their relationship with the arts. They so often presented themselves as artists—especially by calling themselves "peintres-photographes" and by surrounding their names by images of putti, palettes, and other symbols of the arts on the back of their photographs—and that strongly suggests a wish to be equalled with traditional artists. The latter will not always have appreciated these efforts to claim or reach the status artists held. Photography was not considered an art. On the contrary, it was judged a technical invention that required certain skills but no artistic mastery. The camera did most of the work, not the photographer. Painters or engravers hardly ever expressed themselves upon this subject, but art critics were more outspoken. Photography might be useful as a documentary means—it was especially appreciated as a way to reproduce works of art—but it lacked artistic qualities. The ways of reasoning will have been about the same as in any other country.

To be sure, most portrait photographs *did* lack artistic merit. Carte-de-visite portraits are done in the same way to an astonishing degree. Variation was a word not in the photographer's vocabulary. The same props were used over and over again: tables, seats, carpets, columns, balustrades, in later decades also painted backgronds. The setting and postures were regardless of the persons depicted. It is striking that the wealthy, amateur photographer Alexandrine Tinne (1835–1869) used exactly the same props when she made some portraits of her relatives in the garden of her house in The Hague in 1860–1861. The same applies to a series of domestic scenes the amateur photographer Jordaan Everhard van Rheden made in the 1860s and 1870s. One would have expected an amateur to feel free to deviate from the stereotype settings professionals took to.

Regarding the invention or development of new techniques or apparatus, Dutch photographers were not in the front row. They merely followed what was being done abroad. At first France was the country that was looked upon as a source of things new, later Germany took over this role. There have been a few exhibitions—especially those in Amsterdam in 1855 and 1860—where foreign photographers like Gustave Le Gray, Edouard Baldus, and the Bisson brothers showed their works, but this seems not to have stimulated Dutch photography very much. There is no sign that it changed much after these exhibitions took place. Photographers still clung to making portraits; cityscapes, art reproductions and the like were produced on a much smaller scale. Landscapes are quite rare in Dutch photography and until the advent of Pictorialism (*picturalisme* in Dutch) in the 1890s "free photography" hardly existed. Amateurs were an exception to this, but their number was relatively modest. However, they hold an important place among the photographers who have left a considerable oeuvre that is still appreciated nowadays for its artistic qualities. Besides Asser and Tinne three men should be mentioned who were active in the last decade of the 19th century: the painter Georg Hendrik Breitner (1857–1923), his friend and colleague Willem Witsen (1860–1923), and the architect and headmaster of a technical school Jacob Olie (1834–1905). Breitner and Olie photographed extensively on the streets in Amsterdam and did portraits—Breitner also photographed many nudes—while Witsen mainly took portraits of his fellow artists and of young contemporary writers. All three made pictures that lack the stiffness and coldness of professional work. As they did not take part in exhibitions and their work was not known outside their own circles, they did not have any influence on the course of Dutch photography. Other amateurs united in societies that were founded in many a Dutch town from 1887 onwards. This was due to the introduction of smaller, easier to handle cameras and readymade negative plates. Some amateurs were quite serious about their hobby, others were just making snapshots without giving much attention to composition and other aspects of photographic aesthetics.

Snapshot photographers were fiercely attacked for lowering the average level—especially by the Pictorialists who wanted photography to be accepted as an art form rather than considered just a pleasant pastime. Pictorialism rose in the 1890s and was to dominate the scene after the turn of the century. It recruited its followers from both professionals and amateurs. They not only turned against the snapshot photographers who were criticised for being too unpretentious, but they also scorned the way most professional portrait photographers conceived their occupation. The Pictorialists took offence at the props used over an over again and at the large amount of retouching which made people look like "billiard balls" or "wax statues.." Instead, Pictorialists like P. Clausing, C.M. Dewald, and C.E. Mögle wanted to do justice to their sitters by treating them as individuals. No portrait should be the same, as

no person is identical. They also paid more attention to better printing techniques like the platinum print and the gum bichromate print. Apart from portraits, they did landscapes, genre scenes, and city views; in this, they were much inspired by the painters of The Hague School. There is, perhaps, a certain nostalgia in Pictorialist pictures; scenes of quiet life on the land constitute a substantial number of them. They usually display a quiet atmosphere, largely due to the diffused incidence of light. The concern felt for farmers, workmen, tramps, and gypsies was rather superficial, however, as they mainly served as picturesque motifs. The 1890s saw a new élan, with the founding of photographic magazines and the organisation of some international exhibitions. In 1902, the Nederlandsche Fotografen Kunstkring (NFK, Dutch Art Photographers' Circle) was founded to give some more direction to the Pictorialist school. Some belonging to the first generation of Pictorialists could also be dubbed naturalist photographers, but as their number was modest, like the amount of their pictures that have survived, it is not always easy to make a clear division between the two tendencies.

In the 19th century, Dutch photography followed a course that did not differ much from what was happening abroad. Despite international exhibitions that were held from time to time, some photographer's membership of foreign photographic societies, and the constant influx of foreign—especially German—photographers who settled in The Netherlands, 19th-century Dutch photography did not develop to the same heights as in some other countries.

HANS ROOSEBOOM

See also: Bisson, Louis-Auguste and Auguste-Rosalie; Pictorialism; Baldus, Édouard; Le Gray, Gustave; Cartes-de-Visite; Asser, Eduard Isaac; and Lumière, Auguste and Louis.

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NETTLETON, CHARLES (1826–1902)

English studio owner and photographer

Charles Nettleton was born in 1826 in London, the son of George Nettleton and Susannah Feathers. Charles worked as a manufacturing chemist in London and in 1854 immigrated to Melbourne, Australia where he was employed as a photographer in the studio of Duryea and McDonald. Nettleton performed the outdoor work. Nettleton set up his own studio in 1858 and plied a trade in portraiture but he remained a prolific view photographer, working for the Victorian Government and City of Melbourne Corporation, capturing all aspects of Melbourne and the Victorian countryside, including buildings, public works, transportation and sporting teams. For a brief period in 1861 Nettleton was in partnership with Charles Hewitt, during 1862 he managed the Melbourne Stereoscopic Company and then he formed another brief partnership with John Calder. Finally in 1864 he established premises in Madeline St., North Melbourne although various branch facilities were opened over the years. Nettleton produced the first commercial album in Australia, *Melbourne Illustrated by Photographs* in 1868 and he prolifically produced views in carte de visite, full plate and mammoth plate sizes for many years, being a master of the wet plate process. Nettleton exhibited widely at Australian and International Exhibitions. He finally retired from his profession in 1893 and he died on 4 January 1902.

MARCEL SAFIER

NEUHAUSS, RICHARD (1855–1915)

Richard Neuhauss was a doctor of tropical medicine who resided in Berlin but traveled widely. He published on many medical subjects but also was a superb experimentalist in photography with a special affinity for the Lippmann Process. Following German colonization he traveled to Papua New Guinea and published on his medical and photographic studies of the indigenous people there. He made a number of photographs of Otto Lilienthal's early flight experiments, and worked on early cinematography.

His Lippmann shooting records and about a half dozen plates are held by the Preus Fotomuseum in Vestfold, Norway, near Oslo. The lists describe more than 2,500 test exposures, a record for the process. Of these, only a tiny fraction, perhaps two dozen are known to survive. Most may have been failures. According to the lists, their subjects were relatively few and shot repeatedly, including self portraits, stuffed parrots, dead butterflies, still-lifes of flowers and foods, and a few outdoor images. He published a number of papers and a book on the process. He used his technical skills to publish images of microscopic thin-sections of

Lippmann images, which display their internal layered structure. Based on his surviving Lippmann images, he was a master of the process.

A primary source of interest for him in his photographic pursuits was the search for a color photographic process that would render high fidelity color images of microscopic subjects. In this goal he appears to have succeeded, as there is a superb Lippmann-type image of a microscope slide of a thin section of a human liver, showing the presence of a parasite, held at the National Technical Museum in Prague. Due to the super high resolution of Lippmann-type images, it would be capable of extreme further enlargement. As it is it is simply beautiful.

WILLIAM R. ALSCHULER

NEURDEIN FRÈRES

French company

One of the leading commercial photographic firms of the late nineteenth century, Neurdein Frères offered a diverse production including portraits, architectural and picturesque views of France and neighboring countries, and studies of provincial or North African women in traditional costume. Also heavily involved in photography of works of art shown in the Paris Salon and of the temporary architecture of several World Fairs, Neurdein Frères eventually acquired semiofficial status, managing and supplementing the French government's archives of photographs of historical monuments. These added administrative duties led to the withdrawal of Neurdein Frères from other photographic activities and to its eventual merger with a rival firm. Though its work was extensively published by Neurdein Frères itself and by other firms, it is not widely known today. Recent controversies over "Orientalist" photographs of women, however, have again brought attention to works by Neurdein Frères.

Little is known about the background of the Neurdein family. Etienne (1832–after 1915) and Louis-Antonin Neurdein (1846–after 1915) were the sons of the photographer Jean César Neurdein, who worked under the pseudonym of Charlet. In 1863, one of the Neurdeins operated a studio on the Rue des Filles-du-Calvaire in Paris. Subsequent Parisian locations of the Neurdein firm were the Rue des Filles-Saint-Thomas, Boulevard de Sébastopol, and Avenue de Breteuil. By 1868 the firm, now under the name E. Neurdein, advertised portraits of historical personalities and contemporary celebrities and already offered views of France, Belgium, and Algeria. The views were sold initially as albumin prints, later sometimes as gelatin silver prints, and were also reproduced in postcard format under the names ND Phot. or X Phot. The firm also became involved in extensive book publication based on its own photographs.

The brothers maintained a division of labor: Etienne managed the studio in Paris and made portraits, while Louis-Antonin traveled extensively, making architectural and landscape views.

The portraits, whether of prominent or little-known individuals, were usually in carte-de-visite format and differed little from comparable work produced by other photographic firms of the period. One Neurdein portrait, however, a Woodburytype of the chemist and political revolutionary François-Vincent Raspail, was included in 1878 in the prestigious *Galerie Contemporaine*, a lavish biographical publication dominated by works by the well-known portraitists Nadar and Etienne Carjat. The undated portrait of Raspail, who died in that year, depicts a still-forceful older man.

Views of castles, cathedrals, and architectural decorations, particularly in the French provinces, made up a large part of the firm's production; in this the Neurdeins emulated the role of other prominent European firms, such as Fratelli Alinari of Florence, in documenting architectural and artistic monuments. The selection of views offered was vast: a catalogue published by the firm in 1900, covering only works available in postcard format, ran more than five hundred pages. Louis-Antonin was by no means, however, the only photographer recording historic French architecture, and it is difficult to define a *style Neurdein* that might separate his work from views made by rival firms. Neurdein's photographs of medieval buildings, such as the Abbaye-aux-Hommes, Caen, are often taken from rooftop level to give views clearly separating the subject from the surrounding townscape. Other images provide valuable documentation of much vernacular architecture that has since disappeared due to war damage or modernization. This interest in bird's-eye views eventually may have led to Louis-Antonin's experiments with panoramic photography, especially of Paris, one of the most distinctive areas of his work.

Around 1900 Neurdein Frères branched into a new endeavor, depicting Algerian and Tunisian women in native costume in images disseminated both as albumin prints and postcards. This popular genre belongs more to erotica than to ethnology: the models often are overdressed and seminude at the same time. Such images have been condemned in recent years as manifestations of colonialist domination. It is true that these photographs are quite different from Neurdein's earlier, more sedate images of Alsatian or Breton women in folkloric costume, and the intervention of a local photographer working for the firm is a possibility. The North African figure studies are nevertheless more discreet than comparable images produced by rival firms such as Lehnert & Landrock, Geiser, or Lévy.

Louis-Antonin became a member of the Société française de photographie in 1884 and joined the Chambre syndicale de la photographie in 1886, followed by Etienne in 1902. The brothers were awarded prizes in several exhibitions, including the Expositions Universelle, Paris of 1889 and that of 1900, for views, often of considerable technical achievement, that were produced using a Moëssard panoramic camera. Their negatives of paintings exhibited in the annual Paris Salon were published in phototypogravure, creating lithograph-like images that were probably seen as more faithful to the original works.

In view of these accomplishments, the French government in 1898 awarded Neurdein Frères a concession to manage the photographic archives of the Service des Monuments historiques. This responsibility, which continued until World War I, involved maintaining the collection and printing and selling photographs from existing negatives by many artists. The firm also recorded additional historic monuments, particularly in Corsica, adding a thousand glass plate negatives that still exist in the archives. These activities left less time for the firm's other work, and early in the new century it merged with the Lévy firm as "Lévy et Neurdein réunis, 44, rue Letellier, Paris," operating under that designation into the 1920s.

Albumin prints, frequently large, by Neurdein Frères are found in many souvenir albums put together by British and American tourists to record their travels on the Continent. Such works preserve an architectural heritage that often has been altered or lost. The firm's popular views of Paris and of the Exposition Universelle of 1900 were issued in albums of mounted albumin prints and published in photogravure, often following a fixed order of subjects. Through these images, as well as their panoramic cityscapes and their controversial figure studies from the North African colonies, Neurdein Frères made a significant contribution to the photographic record of their time.

Donald Rosenthal

See also: Architecture; Orientalism; Woodburytype, Woodburygravure; *Galerie Contemporaine (1876–1884)*; Nadar (Gaspard-Félix Tournachon); Marey, Etienne Jules; Alinari, Fratelli; Société française de photographie; and Expositions Universelle, Paris (1854, 1855, 1867, etc.).

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NEVILL, LADY CAROLINE EMILY (1829–1887); AUGUSTA, LADY HENRIETTA (1830–1912); AND FRANCES, LADY ISABEL MARY (1831–1915)

The 1852 exhibition at the Society of Arts in London included *A Portrait* by Lady Augusta Nevill, together with *Portrait of a Lady* by her sister Lady Isabel. With their sister Lady Caroline, they were the daughters of William Nevill, 4th Earl of Abergavenny.

'The Ladies Nevill' contributed two collections of work entitled *Portraits and Groups* and *Portrait Groups* to the 1854 exhibition of the Photographic Society of London, of which they were all members. All their images exhibited in 1852 and 1854 were described as by the collodion process.

These appear to be the only two occasions the ladies exhibited their work in major exhibitions, preferring instead to circulate images through the Photographic Exchange Club.

The Photographic Exchange Club album for 1855 contains two images by Lady Augusta, of the family home, Allington Castle in Kent, one by Lady Caroline, of Malling Abbey, and one titled *Allington, Kent* by L.F.C.Nevill whose identity cannot be confirmed. All are by le Gray's Waxed Paper process.

Two years later, the 1857 album included *Birling, Kent* by Lady Caroline, and two views of Eridge, East Sussex by Lady Augusta Mostyn. Lady Augusta married the Hon. Thomas Lloyd-Mostyn in 1855.

There are no records of their involvement with photography after 1857.

John Hannavy

NEW SOUTH WALES GOVERNMENT PRINTER

The New South Wales Government Printer (NSWGP), a public works department in Sydney, was established in 1859 as an extension of the postage stamp department. The first Government Printer, Mr. Thomas Richards, established the "Photolithographic and Lithographic" department in 1868 and the "Photomechanical" department in 1877. Richards' intention for the photographs was the depiction of natural features and the material progress of the colony; the distribution of the photographs was promotional. Photographs were sent to international exhibitions, including the Centennial International Exhibition, Melbourne, 1888, when the department sent 178 photographs. The main form of presentation, however, was in album format, produced internally by the Printer's binding department. The quality, style, and size of the albums were remarkable and produced as gifts for official visitors. The "Album of Views of New South Wales" presented to Lord Knutsford, the Colonial Secretary, in 1891 at the first Federal Convention includes civil works, public buildings, bridges, the Sydney Botanic Gardens and outlying districts. The photographers within the department remain unknown, but the "Narrative of the Expedition of the Australian Squadron to the South East Coast of New Guinea, October to December, 1884" (1885) has been attributed to Augustine Dyer (1873–1923). Photographs were purchased and commissioned from commercial operators including Henry King, Charles Bayliss, and Charles Kerry. Mr. Charles Potter succeeded Mr. Richards as the Government Printer in 1886.

JULIA PECK

NEW ZEALAND AND THE PACIFIC

Although the chronology of events regarding the announcement of the Daguerreotype process in late 1839 could have seen a camera and chemicals loaded on board one of the New Zealand Company's immigrant ships as it set sail from London to establish a settlement in Port Nicholson, in the lower half of the North Island, New Zealand, this was not to be. Thus the opportunity to document the founding of a British Colony from day one was passed over as other more important necessities of life found room in chests and trunks of those who braved the long voyage and the uncertainties of life in a new country. When a camera finally entered the coastal waters of New Zealand, it probably wasn't even taken out of its case before it left the northern port of the Bay of Islands in March 1841, on board a barque bound for Sydney, Australia. There its owner, a Captain Lucas of the French vessel Justine made a daguerreotype on April 13, 1841 which received publicity and is still heralded as the first photograph to be made in Australia.

The first written account of a daguerreotype being made in New Zealand appears in the journals of Lieutenant-Governor Edward John Eyre 1815–1901, who recorded that he failed in an attempt to get a likeness of Eliza Grey, wife of the Governor George Grey, who sat for him on the verandah of Government House, Wellington on September 17, 1848. Besides the amateur attempts of Eyre, trader entrepreneurs like J. Polack and J. Newman advertised their services in the art of daguerreotype portraiture in Auckland in May 1848. Promising as these announcements may seem, no New Zealand daguerreotype earlier than November 1952 can be positively attributed to any particular photographer. In this instance, it was Lawson Insley who visited several settlements in New Zealand between 1851–1853. His clients were Civil Servants, Ministers of the Church and successful trades people. When he finally left for Australia in 1853, he was one of the last itinerant photographers who came to New Zealand before crossing the Tasman Sea for more lucrative prospects in Australia.

After Insley, there was a gap of a year or so until 1855, when John Nichol Crombie 1827–1878 a Glaswegian who visited, provided portraits for whoever could pay his fees. His contribution to New Zealand photography is important for a number of reasons. First he experienced the transition from daguerreotype to collodion positives (ambrotypes) and then finally to the wet plate negatives which allowed paper prints to be made from a collodion negative. Secondly, his achievements in photography are easy to document because of numerous comments made about him in newspapers of the day. From all accounts, he was very outgoing and attracted attention wherever he went in New Zealand and overseas. During a brief visit to where he was born in 1862, he lectured the Glasgow Photographic Association on his New Zealand experiences. This event was duly reported in the British Journal of Photography which included some interesting statistics concerning how many portraits he made as a daguerreotypist in New Zealand. Thus we have a very good picture of his life and times as a pioneer photographer who spent nearly all of his professional years in New Zealand. While portraiture naturally remained his main source of livelihood, he periodically covered topical events, from a Royal Tour to Civil Engineering Projects in Auckland.

The constant flow of photographers between Australia to New Zealand continued in the 1850s and into the next decade following gold discoveries in both the North and South Islands.

Daniel Louis Mundy 1816/7–1881 was born in Wiltshire, England, and arrived in Dunedin in 1864 with sufficient capital to take over William Meluish's photographic business. Two years later he moved to

Christchurch where he made the acquaintance of geologist Julius von Haast, a person who was to play an important role in Mundy's photographic career. Leaving the portrait side of his business to a partner, Mundy commenced a series of New Zealand landscapes, starting with a journey from Canterbury to the gold fields of the West Coast through a newly discovered pass in New Zealand's Southern Alps. In doing so he depicted a route along which supplies could be transported to the diggings safely without recourse to using coastal shipping and the treacherous river ports of the West Coast. Gradually as he moved further afield from Christchurch he acquired a range of views which made him the first to go about the task of accumulating a fairly representative selection of New Zealand views.

Forever mindful of the circumstances that made New Zealand unique from the rest of the world, Mundy photographed the country's major rivers, lakes and mountains, supplementing these when he could with mining operations, flora and fauna. In 1869 with history in mind, he journeyed to the East Coast of the North Island to photograph the spot where Captain Cook had landed a hundred years ago. An exponent of the collodion process he developed many tricks of the trade to combat the stress and strain of taking photographs in a country where there were very few roads. His trials and tribulations along with other interesting anecdotes are recorded in the British Journal of Photography December 25, 1874. Altogether he made 250 photographs which he considered to be the pick of his collection. He exhibited these in London while supervising the production of his book, Rotomahana—the Boiling Springs of New Zealand, 1875. With descriptive notes by the distinguished Austrian explorer and academic Ferdinand von Hochstetter, his plates were printed using the newly discovered Autotype Process. The quality and presentation of his work at the 1873 Vienna International Exhibition and Rotomahana earned him a decoration from the Austrian Court.

In later years he moved to Australia where amongst other things he gave magic lantern lectures about his adventures in New Zealand and how he had to ford snow fed rivers in the Southern Alps and journeyed through territory in where the hostile Maori chief Hone Heke and his raiding parties were known to reside.

While Mundy and other photographers were coming to grips with landscape photography in New Zealand, Dr. Alfred Charles Barker 1819 –1873 was documenting his family and friends in Christchurch. Barker came to New Zealand from England in 1850 on one of the first four ships that founded the Canterbury settlement. When a riding accident curtailed his activities as a medical practitioner, he gave up his practice and concentrated on Civil Administration, Land Deals and Photography. His earliest adventures into photography are dated 1858 and include the way Christchurch was founded on swamplands which had to be drained before the town could be laid out to a grid pattern bounded by four avenues a mile apart. Using equipment that he improvised for his needs, his work is noted for his outdoor portraits which were made in his Œstudio—the front garden of his house. Despite a somewhat cavalier attitude towards certain technical disciplines like using odd bits of glass which he crudely shaped to fit his camera, his portraits reveal personal characteristics of many of his sitters. A distinguishing feature of his work is a series of self portraits which he made from 1858 to shortly before he died in 1873. These tell of the hardships colonial life held for him.

John Kinder 1819–1903 who was born in London came to New Zealand in 1855 and took up a position as headmaster at the Church of England Grammar School in Auckland. A brilliant draughtsman and watercolourist, he took up photography around 1860 and quickly mastered the collodion process. Because a considerable number of his photographs replicate some of his watercolour studies, an observer might be drawn to conclude that he acquired his photographic skills purely as an aide memoir for his painting. Contradicting this are his more informal photographs which disclose a sensitive eye for studies which range from a Maori youth selling fruit on an Auckland Street, to friends and neighbors posed outside their houses. Possibly the most entrancing are a series of photographs of his wife Celia who posed for him on a number of occasions. In comparison to Barker, Kinder's studies are extremely formal and correct in every detail. They reveal a meticulous person whose approach to the visual arts were based strictly on the conventions of 19th century art.

Women photographers for the most part in New Zealand during the 19th century, were confined to assisting their husbands. Elizabeth Pulman 1836–1900 who was born in Cheshire, went beyond these limitations upon the death of her husband in 1871 and took over the control of their studio in Auckland. With her son Frederick, she carried on a very successful business which was noted for its fine selection of Maori portraits.

Another notable contributor to the photographic documentation of New Zealand was James Bragge 1833 -1908 who was born in South Shields and traveled with his wife and family to Wellington in 1864. His photographs show how Wellington changed in stature from a sleepy Provincial Town to a Capital City with the transfer of Central Government from Auckland in 1865. This episode in the development of the capital was made all the more dramatic with injections of capital from overseas which had been negotiated by the then Prime Minister Julius Vogel in the 1870s. Bragge's commitment to large format photography with 16 × 14 inch glass plate negatives, leaves nothing in doubt over the

appearance of the Capital City and its hinterland—the Wairarapa. His views of this region, which were made with the aid of a horse driven van that served as a portable darkroom, encouraged investors to develop this region. His work on this project earned him medals at the Sydney and Melbourne International Exhibitions of 1879 and 1880–1881.

As admirable as the professional activities of Crombie, Mundy and Bragge might be, the colossus of New Zealand 19th century landscape photography was undoubtedly Alfred Henry Burton 1834–1914 who was born in Leicester. As one of four sons who helped their father John Burton operate a photographic business which had branches in Birmingham, Nottingham and Derby, he was no newcomer to photography when he joined his younger brother Walter in 1868, who had immigrated to Dunedin, New Zealand, two years previous to this amalgamation. This was not the first time Alfred had been in New Zealand, in 1856 he'd journeyed to there to spend three years in Auckland as a printer, following this up with a similar stay in Sydney, Australia.

The firm the brothers founded became known as Burton Brothers. It prospered with Walter responsible for the portrait trade, allowing Alfred to travel beyond Dunedin to build up a collection of scenic views in a specially constructed van which acted as a portable darkroom. The first series of negatives he made was devoted to settlements in the province which had yielded rich deposits of alluvial gold. Then by the Government steamer Luna in 1874, he accompanied an exploratory expedition to a territory on the South West corner of the South Island known as Fiordland.

After Walter's death by suicide in 1880, Alfred admitted Thomas Mintaro Muir to the partnership, an arrangement which allowed Alfred to continue documenting nearly every town and settlement in both North and South Islands. In 1884 he took his camera on a winter cruise of the South Pacific and added another valuable series of views which were known as "A Camera in the Coral Islands." The following year, he chanced upon an expedition that was being formed to explore the upper reaches of the Whanganui River. The expedition was mounted to investigate a possible route for the North Island Main Trunk Railway between Wellington and Auckland. This trek passed through an area called the King Country which was populated by Maori tribes. Over a period of 37 days in April-May 1885, Alfred managed to make 230 whole dry-plate views featuring the various villages through which he and the expedition passed. Today these photographs are considered the most important authentic visual records of the Maori in their natural habitat. Their sale under the title "Maori at Home," won him many awards including a Fellowship of the Royal Geographic Society of Great Britain.

In 1898, Alfred sold his interests in the business to George Moodie 1865–1945 who was born in Dunedin and had taken over the role of the firms scenic photography. Moodie went on to expand the business under the title of Muir and Moodie. A major part of his energies were directed towards the tourist trade with albums of scenic views and postcards. He was the first photographer, born and raised in New Zealand, to make a distinguished career for himself.

Nineteenth century photography in New Zealand was dominated by the documentation of the land. The impact that this focus had on our forefathers at the time is reflected upon by one art authority, Edward Lucie-Smith. Drawn to comment on a particular New Zealand photograph by James Bragge of bush covered hills he said. "To the eye of someone nurtured on European landscape painting, this still seems an impossible almost outrageous kind of image—a land altogether alien, hostile, and sufficient unto itself." As the land was cleared and farmed, the emphasis changed from studies of virgin bush and natural features to what had been won by clearing the land with a destructive policy called "Slash and Burn." After these pioneering years which established a sound economic footing through farming, photographers became preoccupied with providing attractive views of the natural environment for the burgeoning tourist trade. Hence when George Dobson Valentine 1852–1890 from the Scottish firm of Valentine and Sons died in Auckland after a six year residency in New Zealand, the parent firm dispatched another operator from the other side of the world to carry on his unfinished work. Valentine had come to New Zealand in an attempt to recover from tuberculosis with no thoughts of contributing anything to the firms catalogue of world views.

After a short while it appeared that he could not resist the temptation to make a number of images featuring the principal tourist attractions in the North Island. While the fascination he held for his new environment was probably no different from those who had experienced a similar commitment 30 years earlier, there was now a larger and more visually literate clientele who were as rapacious as those who looked with wonderment upon their daguerreotype likeness.

19th Century Photography in the South Pacific

Nineteenth century photography in the South Pacific falls into several phases. First, there were photographers who were based in Australia and New Zealand who visited the Islands to secure a representative selection of the natives and their environment. New Zealand firms like Burton Bros. of Dunedin and Josiah Martin of Auckland, were matched by their Australian counterparts, namely Kerry and Co. of Sydney, John William Lindt of Melbourne and John Beattie of Hobart. Gradually some of

the larger Islands boasted a resident photographer who not only supplied local needs but were well placed to cash in on the fascination which the developed world held for the people of the South Pacific. With the advent of hand held cameras, missionaries were encouraged by their Religious Orders to record their work of converting the natives to Christianity. This rather patchy coverage during the 19th century, gradually gave way to a more detailed and scientific methodology by virtue of ethnographic expeditions that were mounted by various Governments and Scientific Institutions.

The first substantial body of work to be compiled by a photographer in Samoa, was made by John Davis ?–1893 who as early as the 1870s was producing carte de visite studies while holding the job of postmaster in Apia. Following Davis's death, Alfred John Tatterstall acquired his negatives and continued to sell them for years afterwards. While the pioneering work of Davis must be acknowledged, especially the studies he made of various Samoan customs, the title of who represented the people of the South Pacific to their best advantage, must surely fall upon the shoulders of Thomas Andrew 1855–1939.

Andrew was born in Auckland, New Zealand and operated photographic businesses in both Napier and Auckland. In 1886–1887 he made a tour of the South Pacific on board the schooner *Southerly Buster* to promote trade between New Zealand and the Islands. When his Auckland photography business burnt down in 1891, he decided to move to Apia where he at first began work as an assistant to the incumbent Davis. Andrew went on to extend his range of views to take in a number of staged re-enactments relating to the way victims were dealt with in intertribal warfare in the Fiji Islands. His Samoan nude studies are keenly sought by collectors.

Alfred Henry Burton q.v. in 1884 made what some describe as the first organized expedition to consciously gather together photographs of Samoa and other Islands such as Fiji and Tonga in the Pacific. While his views of villages and plantations are notable for their fine attention to detail, a large proportion of the studio studies which Burton had listed in his catalogue under the title The "Camera in the Coral Islands," were probably the work of either Davis or Andrew.

Another New Zealand based photographer who made a solid contribution to the documentation of the people of the South Pacific was Josiah Martin 1843–1916 who wrote extensively of his experiences when he returned from a tour of The Friendly Islands—Tonga in 1896 in Sharland's *New Zealand Photographer*, a journal which he edited for a number of years.

From Australia John William Lindt 1845–1926 journeyed to the New Hebrides—Vanuatu in 1889 and backed it up with a superb series of Fijian fire walker studies the following year. While Charles Kerry 1858 –1928 was more an entrepreneur and publisher of photographs, he was also a first class cameraman. Another Australian photographer operating for Kerry & Co. called George Bell, made a splendid postcard series titled By Reef and Palm. Finally, Tasmanian John Beattie 1857–1930 spent five months on board the mission steamer Southern Cross touring the Melanesian archipelago where he amassed 1,300 plates at the turn of the century.

While the South Pacific was admittedly a very idyllic if not exotic hunting ground for photographers, their motivations for venturing forth were undoubtedly driven by European concerns. Several nations like Great Britain, France, the United States and Germany vied for control of Samoa and other dependencies when Empire Building was fashionable. No matter the motifs and its spread out nature, Oceania was surprisingly well documented in the 19th century.

William Main

See also: Daguerreotype; Wet collodion Positive Processes; Itinerant Photographers; Valentine, James and Sons; Cartesde-Visite; and Kerry, Charles.

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NEWHALL, BEAUMONT (1908–1993) AND NANCY (1908–1974)

Beaumont was the pre-eminent photographic historian of the twentieth century. A pioneering author, curator, teacher, and photographer, Newhall is universally ac-

knowledged for his vitally important role in establishing the history of photography as a unique and serious field of study. Through his critical appreciation and rigorous scholarly inquiry Newhall championed the medium of photography as an art form in its own right. His overriding contribution to its study was to interpret photography from an historical, critical, and aesthetic perspective, rather than in a strictly technological approach.

Beaumont Newhall's mother was a semi-professional photographer. One of his earliest recollections was of "standing beside my mother in her darkroom while she developed glass plates by the red glow of the safelight. I was fascinated to watch the image appear, as if by magic in the glass tray" (*Focus*, 10). When he was fifteen Newhall taught himself photographic processing, and making photographs became a lifelong passion.

The summer prior to entering Harvard Newhall fell under the spell of the movie *Variety* (1925), directed by Ewald André Dupont, and photographed by Karl Freund. Erich Mendelsohn's *Amerika: Bilderbuch eines Architekten*, 1926, depicting skyscrapers, grain elevators and other industrial buildings was also an early influence, teaching him a new way of looking at photography. At Harvard he hoped to study film and photography, but as there were no courses offered in these subjects, he studied art history. His professors included Adolph Goldschmidt and Paul Sachs. In 1934 he presented his first paper, "Photography and Painting," on the history of photography, at the College Art Association.

In 1936 while working as the librarian at Museum of Modern Art (MOMA) in New York, Newhall, curated the museum's first exhibition of photographs at the request of Director Alfred Barr. Conceived of as an overview of the history of the art form, *Photography 1839–1937* contained a combination of historical and contemporary photographs. Its real impact however, lay in the display of the little-known nineteeth century works. Furthermore, in eschewing the then popular "pictorial" school of photography in favor of exhibiting only "pure" or "straight" [straightforward] photography, Newhall propounded a new photographic aesthetic. In the exhibition catalog Newhall also introduced formal criteria for judging photography as a fine art. The catalog was revised as *Photography: A Short Critical History* (1938), which in turn formed the basis for his *History of Photography from 1839 to the Present Day* (1949). Revised five times and translated into several languages, *History of Photography*, has been recognized as a seminal work in the history of photography and continues to be a widely read textbook.

After this first exhibition, Newhall's passion for photography became his vocation. In 1940 MOMA formed its Department of Photography with Newhall as its curator.

He remained at MOMA until 1947, although his wife Nancy Newhall (1908–1974, see summary below) served as Acting Curator from 1942–1945, while he was stationed overseas, during which time she curated fifteen exhibitions for the museum. Other seminal exhibitions curated by Newhall include the photography section of "Art of Our Time" (1939); "Photographs of the Civil War and the American Frontier" (1942); and the Edward Weston Retrospective (1946).

In 1948 Newhall became the first curator of photography at the George Eastman House and began developing his second major photography collection for an institution. Nancy Newhall arranged the Eastman House's permanent photography exhibition. In the late 1960s Beaumont and Nancy assembled a collection of photographs for the Exchange National Bank of Chicago, an early example of corporate collecting.

When Newhall arrived at Eastman House he had already spent a summer teaching at Black Mountain College. Throughout his tenure at Eastman House he continued to teach at a variety of institutions. He and James Card developed the first courses given for academic credit in the histories of motion pictures and photography at the Rochester Institute of Technology and the University of Rochester. Newhall was known for the quality of his teaching—stressing original thought and research, and the exploration of new subjects in order to expand the history of photography. Many of Newhall's students became curators or professors at major institutions.

Nancy and Beaumont Newhall counted many contemporary photographers among their close friends, most notably Edward Weston, Alfred Stieglitz, Minor White, Paul Strand, and Ansel Adams with whom Nancy collaborated on numerous projects. Nancy Newhall's concentration on working with practicing photographers was no doubt due to her own training as a painter and artist. In addition to her more than two decades of work with Ansel Adams, Nancy Newhall wrote and worked with Paul Strand and Edward Weston, whose day books she edited (1961–66). Whereas posthumous evaluations of an artist's life and work had been the norm for art history monographs, Nancy Newhall's scholarly work on living photographers set a precedent for serious publications about contemporary artists. The books that she collaborated on with Ansel Adams helped formulate another new genre of pictorial essay—scholarly nature photography books, as epitomized by *This is the American Earth* (1960).

Although Newhall revised and updated his extremely influential core study *History of Photography* five times, the book has not been without its detractors, especially in the late twentieth century when the methodology of art history and the discipline's assumptions came under close scrutiny. Newhall's methodology has sometimes been seen as old-school formalism. Yet, as Carl

Chiarenza has pointed out, "no one has yet produced a less biased, more idea-oriented, or more interesting general history of photographic picture reproduction" (*Colleagues and Friends*, 14).

John Szarkowski has aptly contextualized Newhall's long and productive career and his influence on the study of photography:

> When Beaumont Newhall was beginning his essential work, the great photographer Brassai did not know the name of the great photographer Peter Henry Emerson, and Alfred Stieglitz had not heard of Timothy O'Sullivan. No coherent sketch of photography's first century existed...A half-century later virtually every photographer of ambition has a reasonably catholic knowledge of the tradition that he or she is part of, and almost every art historian understands, at least in theory, that photography is part of their problem. Such a change was not wrought by one person, but it is clear that no one person contributed so much to that change as Beaumont Newhall. (*Colleagues and Friends*, p. 41)

Beth Ann Guynn

Biography

Beaumont Newhall was born in Lynn, Massachusetts, on June 22, 1908. His parents were Dr. Herbert William Newhall (1858–1933), and Alice Lillia Davis Newhall (1865–1940). He received A.B. and A.M. degrees in art history from Harvard University, and did further graduate work at Harvard, the Courtauld Institute of Art, the University of London, and the Institut d'Art et d'Archéologie, University of Paris.

Newhall was a lecturer at the Philadelphia Museum of Art, an assistant in the Department of Decorative Arts of the Metropolitan Museum of Art, and the founding librarian at the Museum of Modern Art, New York, before becoming that museum's first Curator of Photography in 1940. In 1948, Beaumont Newhall became the first Curator of Photography at the George Eastman House and its Director in 1958, building a significant photography collection. In 1971 Newhall became Visiting Professor of Art at the University of New Mexico, where he helped to establish the first doctoral program in the history of photography at an American university. Over the years he also taught at Black Mountain College, University of Rochester, Rochester Institute of Technology, State University of New York at Buffalo, and the Salzburg Seminar in American Studies.

His honors include two Guggenheim fellowships; Honorary Fellow, Royal Photographic Society of Great; Corresponding Member, Deutsche Gesellschaft für Photographie; Fellow of the Photographic Society of America and recipient of its 1968 Progress Medal; and the 1970 Culture Prize of the German Photographic Society.

Newhall wrote over 650 articles and essays. His books include: *History of Photograph from 1839 to the Present Day*, (1949), *Masters of Photography* (with Nancy Newhall, 1958), *The Daguerreotype in America* (1961), *Frederick Evans* (1964), *Latent Image: The Discovery of Photography* (1967); *Airborn Camera: The World from the Air and Outer Space* (1969); and *Photography: Essays and Images. Illustrated Readings in the History of Photography* (1980).

Newhall married Nancy Wynne Parker in 1936. After Nancy's death he married Christi Yates in 1975. Beaumont Newhall died in 1993.

Nancy Wynne Parker Newhall was born in Lynn, Massachusetts, on December 15, 1908. She graduated from Smith College in 1930 and studied painting at the Art Students League, New York, and married Beaumont Newhall in 1936. She served as Acting Curator of Photography at the Museum of Modern Art from 1942–1945, replacing Beaumont who was overseas with the Army Air Force reconnaissance units.

Nancy Newhall curated photography exhibitions, wrote articles about photographers, edited and introduced photography books by Ansel Adams, Paul Strand, Edward Weston, and others, collaborated with Adams on several books about the American West, including *Death Valley* (1954), *Yosemite Valley* (1959), *The Tetons and Yellowstone* (1970), and *This is the American Earth* (1960), the first title in the Sierra Club's exhibit format series; and *P. H. Emerson: the fight for photography as a fine art* (1975). *Eloquent Light* (1963), her biography of Ansel Adams, covered his career from 1902 to 1938; *The Enduring Moment*, the second volume of Adams' biography was unfinished at the time of her death. With Minor White, Nancy Newhall founded the photography magazine *Aperture*. She died in 1974, struck by a falling tree while rafting down the Snake River with Beaumont.

The papers of Beaumont and Nancy Newhall are held at the Getty Research Library; the Center for Creative Photography, University of Tucson; Houghton Library, Harvard University; and the Marion Center for Photographic Arts Library, College of Santa Fe, which also holds the bulk of their personal library.

See also: Eastman, George; and Stieglitz, Alfred.

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NEWLAND, JAMES WILLIAM (?–1857)

Newland hailed from Redgrave in Suffolk, England. He was a travelling daguerreian photographer who spanned the continents. He is first noted as J. W. Neuland at 124 Royal St., New Orleans in 1845. He travelled via Panama and Jamaica until in December 1846 he was in Lima, Peru then in early 1847 in Callao. In July he was in Valparaiso then he traveled on to Fiji and Auckland, New Zealand, before arriving in Australia where he set up a studio on the corner of King and George Streets, Sydney from March 1848 for three months. Newland presented lavish lantern shows and a diorama in Sydney that he travelled with to Newcastle and Maitland, where he also operated temporary studios. From October 1848 Newland worked from a studio in Murray St., Hobart Town where he took the earliest known Australian landscape photograph and claimed to have upward of two hundred daguerreotypes in his gallery including portraits of natives from Fiji, New Zealand, Peru, Chile, and Granada and a panorama of Arequipa, Peru. The studio closed in December and it appears Newland then left for Calcutta, where he opened the first professional daguerreian studio in Loudon's Buildings, taking in F. W. Baker as his assistant. By 1857 Newland had expanded into positives on paper and glass and he offered stereoviews of Calcutta and its vicinity. He took in his half-brother Frederick Welling as an assistant, and, following Newland's tragic murder at the outset of the Indian Mutiny in May 1857, Welling continued to operate the studio until its closure in 1860.

MARCEL SAFIER

Holdings: Macleay Museum, University of Sydney; State Library of NSW, Sydney; Tasmanian Museum & Art Gallery, Hobart; British Library, London.

NEWMAN, ARTHUR SAMUEL (1861–1943)

English inventor and manufacturer

Arthur Newman was born in 1861. After school he worked for H. and E. J. Dale of London, where he progressed to designing and making photographic changing boxes. He later joined Simpsons of Clerkenwell and became a partner where he was to meet Julio Guardia.

In 1886 Newman was granted his first patent for a photographic shutter (British patent number 7156) which was sold by the London Stereoscopic Company. The shutter was attached to the lens barrel and the shutter blade inserted into an aperture in the barrel.

The partnership of Newman and Guardia seems to have started in late 1891 with the Spanish-born Julio Guardia providing business experience and capital and Newman providing the engineering skill. The firm gained a reputation for producing high-quality cameras starting with a hand camera range (1892), the Nydia (1899), single lens reflexes from 1903 and, from 1908, the Sibyl range which had been originally patented by Newman and the company in 1905. Guardia died in 1906 and shortly afterwards in 1908 Newman left the company relinquishing his shares in return for retaining the rights to the film equipment he had designed. Newman and Guardia Ltd continued making cameras into the post-1946 period.

After his departure Newman established a long-lasting partnership with the photographic retailer and manufacturer James A Sinclair as Newman & Sinclair Ltd, principally producing 35mm motion picture cameras and equipment. NS cameras accompanied Herbert Ponting on Scott's 1910 Antarctic journey, Shackleton's expedition and the 1924 Everest expedition. NS cameras were used extensively for location and studio filming well into the late twentieth century.

Newman's reputation was such that he acted as a retained consultant for the Eastman Kodak Company in Rochester and he designed Pathé's very successful Baby Pathé 9.5mm amateur camera. Newman was actively involved with the Royal Photographic Society and he was instrumental in setting up the British Kinematograph Society in 1931.

He died aged eighty-three in London on 12 August 1943.

MICHAEL PRITCHARD

NEYT, ADOLPHE L. (1830–1892)

Belgian amateur photographer

Born in Gent 13 April 1830, Neyt developed a reputation as an enthusiastic amateur of scientific photography,

concentrating on astronomical and microscopical subjects. His ability to enlarge these images while retaining the clarity of the original was much admired. Most of Neyt's extant photographs were made in the 1860s, when he also joined both the Société française de photographie (1864–1885) and the Association belge de photographie. In 1869, a dozen of his photographs of the moon were presented to the Belgian Royal Academy of Sciences. Neyt perfected a method of making images through a telescope attached to a clockwork, enlarging them to a size of 25 centimeters in diameter with a camera obscura. Some, or perhaps all, of these lunar images were exhibited at the 1873 International Exhibition in Vienna. Although his photographic activity appears to have slowed after 1870, he remained involved, collaborating in 1887 with Édouard van Beneden on the book, *Nouvelles recherches sur la fécondation et la division mitosique chez l'Ascaride mégalocéphale* (Leipzig, W. Engelmann), to supply four accompanying photographs for this work on cellular biology. Neyt died in Oostende 21 September 1892.

KELLEY WILDER

NICHOLLS, HORACE WALTER (1867–1941)

Horace Walter Nicholls was born on February 17, 1867, in Cambridge, England, the eldest son of Arthur Nicholls and Charlotte Johnson, both of Norfolk. His grandfather was John Nicholls, an architect, builder and restorer of cathedrals, churches and castles. The family home was Newnham Grove, Grantchester, Cambridge.

Horace learned photography from his father and uncle, both of whom were listed as professional photographers by the late 1860s. Arthur not only taught his son the technical aspects of wet-plate photography, he maintained that a photographer, even a commercial photographer, was an artist. Horace learned from his father that the camera gives one limitless creative potential and that what some call "tricks" in photography can, with a clear aesthetic vision, purpose, or wit, produce images of originality and value. By the age of fourteen, Horace was listed in directories as a photographer working at his father's studio in Sandown, Isle of Wight.

Nicholls daughters spoke of their father's *wanderlust*. When he was about twenty years old, Nicholls saw an advertisement in a newspaper for a young man to work for a photographer in Chile. He applied and was offered the job and went on an exotic adventure. Nicholls returned to England around 1889 and began working at the Cartland Studio in Windsor. George Cartland held a Royal Warrant. It was here that Nicholls met his future wife, Florence Holderness.

After about three years in Berkshire, Nicholls again became restless and decided South Africa was the next frontier. It was, in the 1890s, an attractive location for an ambitious, talented young man; and after Chile, it may even have seemed a modest choice for someone of British origin soon to be married. Johannesburg, however, in 1889 was little more than a settlement, with acres of empty land between makeshift buildings.

Horace Nicholls arrived in Johannesburg in September 1892 and joined the photographic studio of James F. Goch. He returned to England the following year to marry, and then sailed with his new wife back to South Africa in October 1893. Nicholls now dubbed himself "the Johannesburg Photographer" having renamed his former employer's studio "Horace W. Nicholls, The Goch Studio." In 1896 he left the studio to record a year of tumultuous events: a political crisis, a railway disaster, a dynamite explosion and a huge fire (opposite his studio), a railroad accident, infestation of locusts and a drought. He became the official photographer for the London-based publication *South Africa.* And it was in South Africa, during the Boer War (1899–1902) that he first established an international reputation, making sometimes dramatic, sometimes somber photographs of the conflict. He documented the bombardment of Ladysmith, the movement of troops to frontlines, officers relaxing, the burying the dead and much more. He became one of the world's earliest photojournalists.

Nicholls helped establish the "profession," licensing his pictures for "one-time use and suing publications for infringement of copyright." He was determined, at the onset of photojournalism that photographers should be able to make a living in their new profession and be treated respectfully. It was in the early 1890s the halftone process for reproducing photographs became a commercial viability. When Nicholl's Boer War photographs appeared in the press, half the visual reportage was still drawings.

Nicholls was a quirky photojournalist. After his success documenting the Boer War, he turned aside from major events and concentrated on what today might be called "human interest" stories. He liked to stay away from the pack of early photojournalists and create his own subjects. He stated, "The chief aim of my work in photography is pictorial effect in preference to photographing anything and everything." He always tried to make strong, compelling pictures.

The one subject he could never resist, even if the field was filled with cameramen, was "the Season." Ascot, Derby, Henley, Goodwood, Cowes were annual events he photographed with wit and imagination. Even though he prided himself on being a journalist, he was always ready to montage crowd scenes, multiplying the numbers of people watching the horse race and altering juxtapositions. He liked multiplying the number of umbrellas, too, held overhead. A viewer would be mis-

guided to "believe" all Nicholls press pictures, many of which appeared in *Black and White, The Daily Sketch, The Daily Mirror, Illustrated London News, Penny Pictorial, South Africa, The Bystander, The Illustrated Sporting News, The Graphic, The Referee, The Sphere, The Sunday Companion, The Tatler, The Times and The Guardian.*

When the Great War broke out in 1914, George Nicholls, Horace's eldest son, enlisted (he died in combat in 1917). Horace envisioned himself as a war correspondent, but at 47, he was too old to be with the combat troops. He wrote frequently to the Department of Information to receive an official appointment and asked to be sent abroad. He did receive an appointment, but he would stay in England recording the home front and providing the propaganda-type images that were being requested of the agency. He was recorded events such as the review of troops by the King and also munitions factories, shipbuilding, prisoners of war, men back from the Front and everything else that was required.

The photographs taken between 1917 and 1918 constitute some of Nicholls' finest work. He will especially be remembered as capturing the moment in history when women walked out of their homes and into men's jobs. The combination of a seemingly thorough investigation, a straightforward approach, and great sensitivity make his "women at war" photographs one of his most important contributions to the history of photography. "A Woman Coke Heaver," "A Woman Grave Digger," "The Electric Trolley Driver," are among his classics.

Immediately after the end of the war, the Ministry of Information's responsibility of commissioning and collecting photographs was transferred to the Imperial War Museum where Horace Nicholls was asked to be on staff. He role was to head the darkroom and be responsible for the care, preservation and re-photographing of deteriorating negatives from all the war fronts. He, himself, had made 2,300 negatives during these years. He stayed at the Museum from 1918 until his retirement in 1932.

Even during his years of civil service, he worked freelance for newspapers and journals. In the twenties and thirties, along with scores of family photographs, he produced professional quality images on holidays at home and abroad. Horace Walter Nicholls retired to Worthing and died of diabetes on 28 July 1941. The major collections of his glass and film negatives and prints are in the Royal Photographic Society Collection at the National Media Museum in Bradford, the Imperial War Museum, London and with the Nicholls family.

GAIL BUCKLAND

See also: Africa (sub-Saharan); and War Photography.

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NIÉPCE DE SAINT-VICTOR, CLAUDE FÉLIX ABEL (1805–1870)

French army officer and chemist

Abel Niépce de Saint-Victor was born on 26 July 1805 in Saint-Cyr, France. He was the second cousin of Nicéphore Niépce, to whom he always referred as an uncle. A career officer in the military, in 1827, he graduated from the École de cavalerie de Saumer [Cavalry School of Saumer]. In 1842, he obtained the rank of lieutenant and was stationed with the first regiment of dragoons at Montauban.

Niépce de Saint-Victor's first encounters with chemistry are legendary. One day, he accidentally stained the red pants of his military uniform with vinegar or lemon juice. Wanting to remove the stain, he tried a number of chemical solutions and finally succeeded with a few drops of ammonia. Following this, the French Minister of War decided that all the lapels, collars, and ornamental details of the uniforms of all the regiments of cavalry—which had previously been variously colored pink, saffron yellow, and crimson—should be orange. Niépce de Saint-Victor was put in charge of chemically altering the original colors of the uniforms so as to arrive at the same color. He succeeded in this, saving the army a great deal of money, and his vocation to the study of chemistry was determined.

In 1845, Niépce de Saint-Victor was stationed at the Military Police station of Paris, located in the faubourg of Saint-Martin. There he set up a laboratory in the basement and began research on photochemical operations, largely financed from his own salary.

On 25 October 1847, he published a report of his investigations to the French Academie des Sciences [Academy of Sciences]. There he described a method he called atmography, which reproduced engravings on paper, porcelain, glass, and metal surfaces, using iodine vapors and starch. In the same report, he described a method for obtaining negatives on glass, using starch.

As a consequence of the French Revolution of 1848, on 24 February 1848 his laboratory was burned down and all his equipment destroyed. He was then placed on non-active duty, whereupon he returned to the study of negatives on glass. This led to his publishing a follow-up report to the Academy des Sciences on 12 June 1848, in which he described a method for making negatives on glass using albumen. The procedure was similar to the calotype process then being used, but was capable of finer detail. One drawback was that it was difficult obtain an even coating of albumen on glass. Another

drawback was that the light-sensitivity was low, so as to make portraiture an impossibility. Nevertheless, albumen on glass may be considered significant as the prototype for the later wet-collodion process.

In July 1848, he was stationed with the 10th regiment of dragoons, outside Paris.

In April 1849, he was promoted to Captain of the Republican Guard of Paris and established a laboratory at the military barracks located on the rue Mouffetard. Also in 1849, he received a medal and 2000 francs from the Société d'Encouragement [Encouragement Society] and was awarded the Legion d'honneur [Legion of Honor].

In 1850, he indicated the use of albumen as a binding agent for paper negatives and positives. He also introduced improvements to his albumen on glass process using honey as an accelerator in the iodizing stage and the application of heat in the sensitizing stage, which made portraits possible. He also remarked on the effect of halation, noting how the rear surface of the glass plate reflected light back upon the light-sensitive surface.

Inspired by the work of Edmund Becquerel, in 1849–1852, Niépce de Saint-Victor attempted to make color photographs using a process he called *héliochromie* [heliochromy]. This involved the direct exposure in the camera of a silver plate coated with silver chloride, which had been dipped in a weak solution of sodium hypochlorite, followed by lead chloride in dextrine. Using this process in 1851–1852, he obtained colored reproductions of variously colored subjects like a bouquet of flowers, a stained glass window, and dolls with different types of clothing; however, the images were never adequately fixed and the colors soon faded.

By a miracle of preservation, three of Niépce de Saint-Victor's heliochromes dating to 1851 survive today in a close to original state, thanks to their having been stored in a light-tight box in the collection of the Parisian Musée National des Techniques [National Museum of Technology]. Using low-light level illumination, these were reproduced as color transparencies by the museum, and published in 1984 by Bernard Levebrve. Apart from having turned reddish and faded slightly, the plates show a successful rendition of original colors, the subjects being a detail of a stained glass window and two studies of dolls.

From 1853–1855, Niépce de Saint-Victor returned to Nicephore Niépce's 1820s heliographic process, using copper plates coated with light-sensitive asphaltum. Here he was assisted by the engraver François-Augustin Lemaître, who had also assisted Nicéphore Niépce. By thinning the asphaltum with benzene, he was able to obtain much thinner coatings of asphaltum and radically shorten exposure times in contact printing; however, the process rendered images which were flat and dull, and unable to render delicacy of detail. Similarly, in copying an original photograph or engraving with a camera, the resulting image was diffuse and needed to be re-engraved by hand in order to obtain details.

In 1854, he was appointed Commandant of the *Palais du Louvre* by Napoléon III. This also coincided with a decision to put him on non-active duty, effectively reducing his salary to one-third of what it had been formerly. He lived at the Louvre until his death.

From 1857–1859, Niépce de Saint-Victor experimented with reproducing images in different monochromatic colors, which he again called *héliochromie* [heliochromy]. Using paper sensitized with uranium nitrate, in combination with either potassium ferricyanide, cobalt nitrate, or gold chloride, he arrived at red, green, and violet toned prints. Blue prints were made with paper feebly sensitized with potassium ferricyanide, followed by a bath of mercuric chloride and development with oxalic acid.

In the last years of Niépce de Saint-Victor's life, he wrote a series of articles on the action of light upon light-sensitive surfaces. In 1862, he joined the Société française de photographie [French Society of Photography] and donated a number of original negatives and prints to their collection. In 1861, 1862, and 1863 he received the *Prix Trémont* [Tremont Prize]. He died on 6 April 1870 and was buried at the *cimitaire Montparnasse* [Montparnasse Cemetery].

Alan Greene

Biography

Abel Niépce de Saint-Victor was born on 26 July 1805 in Saint-Cyr, France. A career officer in the army, he devoted his life to the study of photo-chemistry. In 1848, he introduced the albumen on glass process, a precursor of the wet-collodion process. In 1851, he made color photographs on silver plates, which reproduced the different colors of the original subjects, but he never successfully fixed the images. In the mid-1850s, he furthered the earlier research of his second cousin, Nicéphore Niépce, increasing the light-sensitivity of Niépce's 1820s heliographic printing process. In the late 1850s, he discovered ways to make photographic prints with different monochromatic hues, using uranium nitrate. He wrote numerous articles concerning his research, in different scientific and photographic journals, throughout the 1840s–1860s. A recipient of the French Legion d'honneur, as well as many other medals and prizes, he was commander of the Palais du Louvre from 1854 until his death on 6 April 1870.

See also: Becquerel, Edmond Alexandre; and Niépce, Joseph Nicéphore.

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NIÉPCE, JOSEPH NICÉPHORE (1765–1833)

French inventor

A decade of intense experimentation with light-sensitive chemicals and the camera obscura led the Frenchman Joseph Nicéphore Niépce to produce the first permanent images made by the action of light in a camera sometime between 1826 and 1827. The ultimate inability of Niépce to capitalize upon his discovery, which he called Heliography, during his lifetime, left his work in relative obscurity for more than a century. At the time of his death in 1833, Niépce was in a business partnership with Louis-Jacques-Mandé Daguerre, and the extent of Niépce's contribution to the wildly successful Daguerreotype process, made public in 1839, has been the subject of considerable debate. Although Niépce did not himself succeed in perfecting a marketable photographic process, he did resolve perhaps the greatest problem facing early experimenters, how to fix the action of light so as to preserve images formed in light-sensitive materials. Moreover, Daguerre's eponymous process can be seen to emerge directly out of his partnership with Niépce, in the specific chemicals and materials that Daguerre used. More broadly, the details of Niépce's career as an inventor illustrate many of the social and economic forces that fueled the rise of photography in the mid nineteenth century. Niépce sought to bring together advances in optics, chemistry, and mechanics to create a fully automatic means of image production, and thereby to make his fortune.

Niépce's father Claude and his father before him had been King's Counselors, and held land in and around Chalon-sur-Saône in Burgundy, where Niépce was born the third of four children. Following school in Chalon he enrolled in 1786 at the Oratoire in Angers with the intention of entering religious service but withdrew after two years, prior to taking his vows. In the course of his studies he had developed a strong interest in chemical and physical science. After 1788, six years of Niépce's life were devoted to military service, both domestic and foreign. During the early years of the Revolution Niépce was in the National Guard in Chalon, and in 1792 he joined the Revolutionary Army, serving in Sardinia and Italy. He left the army in 1794 with an ocular disorder and settled in Nice, where his older brother Claude joined him. Niépce married Agnès Roméro in 1794, and their first child (the only of three to survive childhood), a son Isidore, was born in 1795. While in Nice, Nicéphore and Claude began investigations into the idea of an internal-combustion engine, work that eventually led to their invention of a boat motor called the Pyréolophore, patented in 1807.

Nicéphore and family, with Claude, returned to Chalon in 1801. In addition to overseeing the family lands and vineyards, the two brothers began to pursue a host of engineering and manufacturing projects. In this respect they were early examples of the new occupation offered to middle-class Frenchmen in the post-Revolutionary years: inventor. The Pyréolophore, which they tested successfully on the River Saône, was the first internal combustion boat motor. Also in 1807, in response to a public competition, the brothers conceived a new hydraulic pump system for the town of Marly to deliver water to Versailles. In 1811, Nicéphore answered a government call for a new process of extracting indigo dye from the woad plant, undertaking nearly two years of intense experimentation. When the new printing process of lithography, invented by Alois Senefelder in 1798, was introduced to France in 1813, Niépce endeavored to practice the technique in Chalon, largely self-taught and at a distance from the material and technical resources found in Paris (in a similar spirit, when the first bicycle, the Draisienne, invented in Germany by Baron Karl von Drais, appeared in 1817, Niépce responded by building his own working model). According to Isidore Niépce, his father's approach to lithography was far from conventional, as he would experiment with different varnishes and acids, on a variety of supports. He also began to attempt to impress designs onto lithographic plates through the action of light, perhaps out of a lack of drawing facility (Gernsheim, 29).

In 1816, with the ten-year patent on the Pyréolophore due to expire the following year, work on the boat engine was taken up again in earnest. The brothers experimented with liquid instead of powdered fuel, including an asphalt known as Bitumen of Judea, and developed what stands as the first fuel-injection system (Hardenberg, 78). At the same time, Claude moved to Paris, in search of supporting partners for the enterprise. When patent renewal in France was rejected, despite several improvements to the device, Claude moved to London, submitting a letter of patent in 1817. With Claude permanently away from Chalon in 1816, Nicéphore began his first experiments with the camera obscura and light-sensitive materials. From this point forward, Claude would largely take responsibility for the boat engine, while Nicéphore turned increasingly to experiments in what he would come to call Heliography, or sun-writing, which he undertook in a workroom at the Niépce family estate, Le Gras, in the village of Saint-Loup-de-Varennes, near Chalon.

Niépce's first experiments with light-sensitive materials placed in a homemade camera obscura were conducted in 1816. He succeeded in taking impressions of views out of his workroom window using paper coated with muriate (or chloride) of silver, but the images were not permanent. Moreover, they were negative images, and attempts to print them in the positive were not successful. At the same time, he experimented with the use of light-sensitive resins on stones or plates, with the intention of etching the images thereby made, and then using the etched plates for ink printing. He foresaw his greatest success lying in this direction: etching would render the fleeting image permanent, and printing would allow its endless reproduction.

It was at this point that he began to experiment with bitumen of Judea (previously used as a fuel for the brothers' engine) as a light-sensitive coating. The bitumen, he had discovered, hardened when exposed to the sun's rays, whereas parts that had not been exposed could be dissolved and washed away by oil of lavender. The result was a fine image formed where light had fallen. His first success with this technique, in 1822, was made by placing an oiled engraving of Pope Pius VII directly on a glass plate coated with a thin layer of bitumen. The image, which was later accidentally destroyed, would have been a negative impression of the engraving. Niépce then turned to applying this process to pewter plates, which he etched in acid, the plate being receptive to the acid in precisely those parts where the lines occurred in the original engraving, and resistant where the exposed bitumen formed a barrier. The etched plate could then be printed in the traditional manner. In 1826, Niépce used this technique to copy an engraving of Cardinal d'Ambroise by Isaac Briot onto pewter plates. He enlisted a Paris engraver, Augustin François Lemaître, to etch the plates and pull prints for him, with considerable success. This technique would come to be called heliogravure.

Niépce envisioned adapting this process to the camera, so that images made from nature could be etched and printed. While never realizing this goal, he was able to capture a faint reverse image of a camera view onto polished stone as early as 1824, though attempts to etch the stone and bring out the nearly invisible image may well have destroyed it altogether. In 1826 he turned increasingly to pewter plates, the reflective surface of which rendered the image more clearly visible, and he acquired more sophisticated equipment from renowned opticians Charles and Vincent Chevalier in Paris, purchasing a camera and several lenses. He began to refer to his efforts to take directly the image of nature as "heliographic," i.e., drawn by the sun. The *View from the Window at Le Gra*s, in the Gernsheim Collection of the Harry Ransom Humanities Research Center of the University of Texas at Austin, is an especially durable example of this technique and seems to have been viewed as a significant accomplishment by Niépce himself. The view out his workroom window, onto the chicken house and fields, was one that Niépce's letters describe repeatedly as a subject for his attempts with a camera, starting in 1816 with his silver-chloride images on paper. The large heliographic plate (measuring 20.3 × 16.5 centimeters) carries a faint coating of bitumen where light struck the plate within the camera; by viewing the plate at an appropriate angle one sees the shadow areas, reflected in the bare pewter, appearing dark in contrast to the relatively light film of bitumen, the result being a legible, if elusive, positive picture of the estate's buildings and the landscape beyond. The exposure time for this image is not known; estimates range from eight hours, proposed by Helmut Gernsheim, who recovered the specimen in 1952, to three or more days, the latter assertion being consistent with attempts to recreate the technique as well as in line with evidence from Niépce's letters (Marignier, "Heliography," 58).

Whether produced in 1826 or, as seems more likely given his increasingly excited letters, 1827, the *View from the Window at Le Gras* was in any case executed prior to September, 1827, when Niépce brought it to London, via Paris, with an assortment of examples of his technique, now christened *Héliographie*. On the way to London with Agnès, to visit Claude who had fallen ill, Niépce met with Daguerre, who had written to him in early 1826 after hearing of his experiments. Daguerre was eager to learn the technique devised by Niépce, who for his part was reluctant to share his findings. Niépce had eventually relented and sent Daguerre an example of an etched heliographic plate. Daguerre had responded with criticisms and suggestions but with overall enthusiasm. Visiting Daguerre in Paris, Niépce

was thoroughly awe-struck by Daguerre's renowned Diorama, yet he remained skeptical about sharing his secrets, given Daguerre's lack of proven experience in fixing the action of light (Daguerre's efforts in this regard had consisted of transitory images made in phosphorescent materials). At the same time he was clearly impressed by the ambition and energy of the worldly Daguerre, whose forward thinking and business acumen might bring about the long sought-after success.

Niépce's efforts to find interest in his Heliography in London were largely disappointed, owing both to his own reticence about the details of his process, and to the lack of visibly dramatic results to his process. At Kew, where Claude was living, Niépce met the King's Head Gardener, William Townsend Aiton, who arranged for the examples of Niépce's heliography and engravings pulled from heliographic plates to be sent to Windsor Castle and displayed alongside other items of contemporary scientific interest. The King's reaction, if any, is unknown, and the items were returned without comment. Aiton then introduced Niépce to Francis Bauer, painter in residence at the Royal Botanical Gardens and member of the Royal Society. Attempts to find support from the Royal Society were met with tentative interest but no great result, nor did Niépce succeed in efforts to arouse interest among members of the Society of Arts. Bauer, however, remained supportive, and on departing for France, Niépce presented him with several examples of his work, including the *View from the Window at Le Gras*, framed like a presentation piece. This was inscribed on the back, by Bauer, "Monsieur Niépce's first successful experiment in fixing permanently the image from nature."

On his return to France in early 1828 (Claude had died shortly after the Niépces departed), Niépce immediately sought to remedy the faintness of the heliographic image, acquiring new lenses from Chevalier, including William Wollaston's periscopic lens. To strengthen the image he proposed using a silver-coated copper plate rather than pewter as the base for the bitumen layer. Following exposure the plate would be held in contact with iodine fumes, which reacted with the bare metal, turning it dark. The bitumen could then be dissolved, leaving the plate reflective in the light areas, and blackened in the dark areas. This allowed for greater contrast and tonal range, as well as for a clearly positive image. He further sought to find a way to lighten those areas exposed to light.

On 14 December 1829, Niépce and Daguerre formally entered into business together. Their provisional agreement was for a ten-year partnership, the goal of which was for Daguerre to assist in perfecting Niépce's invention, both men sharing information freely with the other. As a result of the agreement Niépce drew up a "Note on Heliography," laying out the process for his partner. Daguerre procured new achromatic lenses for Niépce. While Daguerre traveled to Saint-Loup-de-Varennes on three recorded occasions, the bulk of the exchange between the two partners took the form of written correspondence, in which Niépce and Daguerre employed a numerical code to disguise the specific formulas and procedures under consideration, lest they be stolen before officially unveiled.

In 1832 the partners devised an essentially new process that they called the Physautotype (a neologism meaning, roughly, nature's self-image). Instead of bitumen this process used a whitish resin extracted from oil of lavender, which left a light coating affixed to the plate where it had been exposed to light, once it was developed in the vapors of white petroleum (Marignier, "Physautotype," 357–358). As with the improved Heliograph, no examples of the Physautotype appear to have survived, although both processes have been successfully recreated based on Niépce's notes (see Marignier, *Niépce)*. Another possible improvement, a heliographic picture on glass depicting a table prepared for a meal, no longer survives but was reproduced in 1891, in a form that suggests that it possessed considerable tonal gradation.

Niépce died suddenly in 1833, without having realized public success with his techniques. In1835, the partnership was renegotiated between Daguerre and Isidore, to the benefit of Daguerre, who assumed a dominant role in the enterprise, and again renegotiated in 1837 to give the name Daguerreotype to the now much advanced process (Batchen, 25). When the Daguerreotype was announced in 1839, although still within the original ten-year partnership term, emphasis was placed on the single-handed advancements made by Daguerre to salvage the ultimately impractical technique of Niépce. Defenders of Niépce, beginning with Isidore in 1840, have sought to solidify his position as the inventor of photography. In a historical irony, Daguerre's implicit claim to have invented the process that bore his name led to Niépce's first posthumous fame. Hearing of the Daguerreotype in 1839, Francis Bauer wrote a lengthy letter to the *Literary Gazette of London* declaring that Niépce had invented substantially the same technique some ten years previously. In response, a display was arranged at the Royal Society by Sir Charles Wheatstone (Smith, 49). Both William Henry Fox Talbot and Sir John Herschel saw Niépce's work in 1839, the latter declaring Niépce to be the obvious originator of Daguerre's technique, while crediting Daguerre with shortening the exposure time from several hours to as many minutes.

The dreams of both Nicéphore and his brother Claude to realize their fortunes through invention were never realized, and in the wake of Nicéphore's death in 1833 the family estate was sold to cover the many debts accrued

by the brothers. Isidore subsequently reaped the benefit of the partnership with Daguerre in the form of a share of the pension awarded by the French government. As for the reputation of Niépce, the efforts of Victor Fouque in the 1860s, Helmut Gernsheim in the 1950s, and Jean-Louis Marignier in the 1990s, have sought to account for Niépce's role in the history of photography and credit him for his innovations. Apart from debates concerning chronology, priority, and influence, the larger continuity of Niépce's heliographic work with cultural issues surrounding the early history of photography began to be explored by scholars in the 1990s.

STEPHEN PETERSEN

Biography

Joseph Nicéphore Niépce was born 7 March 1765, in Chalon-sur-Saône, in Burgundy, to a landowning family with ties to the Royal Court. The third of four children, he was educated for religious service but, at the time of the Revolution, conceived a career as a scientific inventor. He served in the National Guard from 1788–1792, and as a second lieutenant in the Revolutionary Army from 1792 to 1794. Recovering from health problems in Nice, he met and married Agnès Roméro in 1794. A son, Isidore, was born in 1795. The family returned to Chalon in 1801, where Nicéphore and his older brother Claude shared management of the family estate and worked together on a series of mechanical inventions, until Claude left in 1816. In relation to his work with lithography after 1813, Niépce began to investigate the use of light-sensitive materials for the production of images, including images formed in the camera obscura. Over the next decade he developed his process, called Heliography, but was unable to achieve public recognition. He joined in a business partnership with Louis-Jacques-Mandé Daguerre in 1829. Niépce died on 3 July 1833 in Saint-Loup de Varennes. In addition to the holdings at the University of Texas at Austin, important collections of heliographic studies are at the National Media Museum, Bath, and, with Niépce's pioneering camera equipment, at the Musée Nicéphore Niépce, Chalon-sur-Saône.

See also: Daguerre, Louis-Jacques-Mandé; Daguerreotype; Heliogravure; History: 2. 1826–1839; and Lithography.

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NIGHT PHOTOGRAPHY

The night, according to the French Academy's dictionary of 1858, is 'the length of time during which the sun is below our horizon.' Night is perceived as the opposite to day and daylight. It occupies a mythical space in many cultures and has been imaged through the centuries both negatively and positively. It can be unfathomable, threatening, sorrowful, sexual, modern, dreamlike or poetic. Rembrandt van Rijn's night prints and Francisco de Goya's twilight scene 'Los Caprichos' were precursors to the increasing interest in this subject to a nineteenth-century audience. Night scenes became very fashionable from the 1850s, documenting the social impact of the first gas and electric lights and immortalising the developing modernity of the city. Night and night-life captured the public imagination, spurred on by contemporary painters such as Edgar Degas, Toulouse Lautrec, Claude Monet and James McNeill Whistler.

Technically, photographing night was extremely difficult. It required a very long exposure time and therefore stillness, as well as light from the moon or an artificial source. An added complication was the urgency associated with making daguerreotypes (used from the 1840s to mid-1950s) and wet collodion negatives (used from the 1850s until the 1880s). These need to be developed straight after the image is made, and the complications for the nineteenth-century photographer being in the dark or depending on dangerous and volatile artificial light sources hindered the process.

As photography evolved, so did strategies and techniques for photographing at night. Wet collodion plate negatives must be kept moist from the time they were coated with collodion until they are developed. Exposure time was typically twenty seconds to five minutes and the plate usually dried out in ten minutes. To keep the collodion wet for longer and thus permit a longer

exposure, people experimented with adding substances such as water-absorbing zinc salts or honey. From the 1870s the invention of the highly sensitive dry plate or gelatino-bromide process reduced exposure times to 1/25 second, and soon after cameras became more portable. These advances made photographing at night much easier.

Since it was hard to take photographs in the dark, particularly with the early techniques, night effects could be achieved with photographs taken in daylight: daguerreotypes and calotype negatives produce a reversed background that could be interpreted as a night sky, black against the detailed foreground. Scenes apparently depicting the night were often taken in daylight, *The Illustrated Times* (10, 252, 1860) critiquing, for example, that 'Messrs Bissou's no.35 contains a most successful moonlight effect, though no doubt taken in sunlight.' Gustave le Gray photographed directly into the sun hidden behind clouds to obtain an artistic image that could be mistaken as night ('Brick au clair de lune,' 1856, Musée d'Orsay, Paris).

Night subjects suited many of the viewing devices that were developed. The Italian optician and photographer Carlo Ponti produced night scenes with his invention, the 'Megalethoscope,' a photographic viewer that allowed photographs, slid into the back of the device, to be viewed firstly by reflective light, and then by light from behind. 'Place St Marc avec l'eglise' (1875, George Eastman House) shows crowds in St Mark's square surrounded by illuminations. Areas on the back of the print have been embellished, and this colouring could only be seen when light shone through from the back of the print, echoing the effect of time as the image revolved from (black and white) day to—when backlit—colorful night.

Extra kudos could be earned by taking pictures at night rather than mocking darkness. One of the earliest known images of night (strictly twilight), possibly by Louis Daguerre, is captioned 'Le ponts en la galerie du Louvre, à 5.15. Soleil coucheant' (1839, National Media Museum, UK). It shows bridges along the Seine in Paris and is faint but detailed, suggesting that documentary images of night were possible, and sought after, from the beginnings of photography.

Providing documentary evidence with photographs was a significant advance in journalism, and relied on the problematic assumption that photographs always represent reality. One of the earliest reportage images was a daguerreotype of mills burning at night, taken by George N. Barnard in Oswego, New York, on 5 July 1853 (George Eastman House). The night sky is lit by huge flames, recording a dramatic moment with startling effect.

The night sky was also documented in a scientific way. Daguerre recorded an image of the moon around 1838, with others following suit. Lunar daguerreotypes of George Philips Bond and John Adams Whipple were shown at the 1851 Great Exhibition at Crystal Palace, London and were so popular that they went on tour in Europe. The subsequent wet-plate collodion prints by Warren De La Rue, along with Lewis Morris Rutherford's albumen print *The Moon, New York* (1865) continued to spark the interest in lunar photography. In 1889, Director of the Meudon Observatory, Jules Janssen, recommended that a photographic atlas of the moon be undertaken, insisting that photographs would give the most authentic results. Photographs were also used to document the movements of comets and stars in the sky, contributing to scientific evidence at the time.

Yet the subject of the moon was also used to evoke emotion or atmosphere. Ferrier and Soulier's stereoscopic photograph 'Pont Louis Philippe. Paris. Effet de lune' (1860) shows the night sky being investigated in the same way as John Constable's painterly explorations of the moody daytime sky. The aim could have been to capture a specific time and place, as well as to illuminate and fix the mysterious moon. Moonlight was a romantic symbol, favoured by schools of artists and movements such as Luminism, an American movement in the 1840s and 1850s. As industrialisation advanced in many cities and nature was revered, night landscapes either heightened the atmosphere of the modern city at night, or accentuated its dreamlike qualities.

Whilst artists were exploiting the night imagery in nature, darkness and photography was used to advance the spiritualism movement, popular from mid-century. Various techniques such as double exposures or composite printing were used to produce images of spirits in darkness. Spirit photography fuelled the fascination with the supernatural during this period.

In contrast to the darkness used to effect in spirit photography, many photographers took advantage of modern artificial light sources, such as electricity or magnesium-based inflammable powders. In the 1857 Birmingham photographic Society exhibition, an unknown photographer exhibited a photograph with the caption 'Portrait taken by Gaslight at Midnight. This is a great curiosity, being one of the few attempts made to obtain Portraits by artificial light. The observer will notice the singular effects of light and shade.' Dutch photographer Henry van der Weyde used artificial light and different lenses to take photographs at night. Much later, in Paris in the 1890s, Belliéni took artificial light out onto the night street. In the last two decades of the nineteenth century, artificial light became a key subject in photographs as well as an aid to photographers at night.

Artificial light played an important role in socio-documentary photographs. Jacob Riis used primitive flash photography techniques to document the New York

streets at night, publishing his photographs as books such as *How the Other Half Lives* (1890). At the turn of the century, Lewis W. Hine's photographs accentuated bad working conditions by concentrating on dark or artificially lit spaces. For him, natural light equalled good health and vice versa.

Lit up at night, the modern city became a fin-de-siècle fascination. The French photographer Louis-Gabriel Loppé was one of the first photographers to document cities at night, taking advantage of the dry plate process. He photographed London, Liverpool and Paris producing works such as 'Illuminations de la tour Eiffel la nuit' (c.1889, Musée d'Orsay). His work was influential: Brassai later reproached Andre Kertez for stealing Loppé's idea of photographing at night.

Paul Martin was also influential. Imaging the city in an artistic manner, his 'Piccadilly Circus at Night, London' (1896), for example, was part of the lantern-slide series 'London by Gaslight,' which won a Royal Photographic Society gold medal in 1896. The exposure time was around fifteen minutes and the camera lens was partly shielded from the lights of passing cars. Martin accentuated the gas lamps by tinting the prints in this series blue and yellow. Due in part to the interest in his work, a society of Night Photographers was founded in Britain. Photographers including Alfred Steiglitz, inspired by Martin, made works such as 'Night, New York' (1897), and continued working on night photography into the twentieth century.

A complex but popular subject, night photography in the nineteenth century broaches the gap between pictorialism and realism, scientific and imaginary scenes and, due to the technical difficulty in producing images of night, stood at the forefront of photographic advances of the nineteenth century.

SOPHIE LEIGHTON

See also: Daguerre, Louis-Jacques-Mandé; Le Gray, Gustave; Lunar Photography; Martin, Paul Augustus; and Spirit, Ghost, and Psychic Photography.

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NOACK, ALFRED (1833–1895)

German photographer

Augustus Alfred Noack was born in Dresden on 25th May 1833. The son of a doctor, he studied xylography, illustration and engraving at the Dresden Academy of Fine Arts with Hugo Burkner. In November 1856 he went to Rome where he was a member of the Deutschen Künstverein until April 1860. In the same year he moved to Genoa where he founded one of the most important Italian photographic factories in Vico del Filo. He devoted his activity to views of various tourist resorts in northern Italy but mainly views of Genoa and the Ligurian landscape. He also took photographs of works of art in the museums and churches of Genoa, but he became a very well-known photographer mainly through his landscapes, which were widely circulated by reviews and tourist guides and contributed to creating a typical image of the Ligurian region in accordance with the 19th century vision of pictorial tradition. In the 1880s,

Noack, Alfredo. Statue of a Little Girl.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum" "The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

using the instantaneous photographic process, Noack took important pictures of street life in Genoa, giving an idea of ancient crafts and social habits. He died in 1895 and his archive was taken over by Carlo Paganini. In 1926 his heir, Maria, sold the entire archive, with more than 4,000 negatives, to the City of Genoa, where it is now kept.

SILVIA PAOLI

NORMAND, ALFRED-NICOLAS (1822–1909)

French architect and photographer

Alfred-Nicolas Normand, architect, Prix de Rome scholar at the French Academy, arrived Rome 1846 and took up the calotype, usually signed 'A Normand' and dating from 1850–52. This small collection depicts views of Rome and Pompei, along with Palermo, Athens and Constantinople. His expert images, evocative and sensitive, redolent with the pathos of classical antiquity, surpassed the topographical and architectural study which became common in the commercial albumen period which mostly extinguished such private calotype photographers. The French artists on their Grand Tour to Rome were to form one of the first significant groups of calotypists in Italy, subsequently described as *La Scuola Romana di Fotografia* although there is no evidence of a group as such. Along with the other artists from Northern Europe and America they frequented the social life in Rome centred around the Caffè Greco. The French 'group' included Jean-François-Charles André (1813–83), known as Count Frédéric Flachéron, sculptor, lived Rome 1839–67; Eugène Constant, painter, lived Rome 1848–55, probably the first in Rome to use the new albumen on glass; and Prince Giron des Anglonnes, a contemporary of Normand, also working 1850–52. Normand also became known for his architectural drawings and studies which continue to be sold today in the poster market. He remained a member of the Academy des Beaux-Arts in Paris until 1890, although little would appear to be known of his life.

ALISTAIR CRAWFORD

NORWAY

Through the year of 1839 the publisher Hans Thøger Winther (1786–1851) kept the Norwegian public informed about what was happening in France. In October of 1840 the first daguerreotype was exhibited in Bergen and at the beginning of 1841 another was shown at an exhibition arranged by the Art Society in the capital Christiania (now Oslo). Winther was himself experimenting with fixing images and in 1842 he published his first photographs as lithograph reproductions "from life." Three years later he published an extensive handbook explaining the direct positive process, the negative/positive process and a method for conversion of positives into negatives and vice versa. People could also buy cameras made of wood or cardboard, built after his instructions; his work inspired a growing group of photographers in Norway.

Norway was a rural society with a small population mainly living from agriculture and fishing. There were no really big cities and only a few industrial settlements in the beginning of the 19th century. At the same time, a growing national awareness based on new political circumstances, was making room for new activity, such as building universities, industrialization, railroads, a growing media and political parties. The artistic community formed an important part of this project. So did the growing population of photographers: from 80 active photographers in 1855–60 to about 700 in the national census of 1900 (Erlandsen 2000, 175). It is an interesting fact that the new technique developed side by side with the growing society. We can very much read what was considered important by what was photographed and how the images were used. First and foremost, the community of photographers catered to the demands of the growing middle class for portraits. But they also both documented society as it developed, contributed to new fields and helped give Norwegians images to understand and develop a culture and an identity.

One of the most important early participants in the field of photography in Norway was the Danish pharmacist Marcus Selmer (1818–1900). He came to Bergen in 1852 and established a portrait-studio were he made daguerreotypes and photographs in other techniques. He soon started on a big project: photographing people in local costumes and landscapes from different parts of the country. The images were offered to the popular illustrated press and tourists—both growing industries. The probably first news photography can also be attributed to Selmer: a photograph of the remains of a house burnt down in January 1863 and advertised for sale two weeks later.

Knud Knudsen (1832–1915) probably learnt to photograph from Selmer whom he worked for for many years before he started his own studio in Bergen in 1864. He was the first to systematically photograph the whole of Norway: from Kristiansand to the North Cape. He also documented a rapidly vanishing rural culture. Knudsen made all together 9,000 images before 1898, when he retired and left his business to a relative. No doubt earlier painters and their choice of places to go influenced him, but he expanded the repertoire and that way also peoples knowledge of the country.

The Swedish photographer Axel Lindahl (1832–1906) was engaged by the publisher Richard Andvord in 1882 to photograph Norway. He travelled all through

the country and completed an archive of about 3,000 images, very much the same way Knudsen did. His perhaps most important and innovative images are those of glaciers and winter landscapes from Svalbard. Two series of pictures were published in 1892 and 1897, apart from an extensive use of the archive for illustrations and sale of mass-produced images for tourist-albums. Many more produced landscapes and cityscapes towards the end of the century: Per Adolf Thorén (1830–1909), Ole Tobias Olsen (1830–1924) and the brothers Thorvald Aron (1871–1896) and August Brunskow (1862–1906) worked as a team.

It is an interesting fact that quite a lot of women worked as photographers in Norway from the end of the 1880s and onward. There are several explanations for this. First, the improved technique at this time was easier and fast to learn, it was not very expensive to establish a photographic business, and a law was passed in 1866 that allowed women to have a trade. The large surplus of unmarried women made it necessary to find acceptable occupations. Not all could be teachers or servants, look after their old parents or be looked after by relatives. There was also the belief that women were more suited because of a special artistic understanding. They produced mostly portraiture, but also landscape postcards. It seems, though, that they did not usually travel as extensively as their male counterparts mentioned above, and if their landscapes are different, it is because children often are found playing in the streets or on the beaches. The images have no romantic meaning as defined earlier in the century. They are merely a realistic documentation of small villages and peaceful scenery in places that were popular to visit in the summer. Marie Høeg (1865–1949) and Bolette Berg (1871–1944) in Horten; Louise Abel (1841–1907) in Christiania; Augusta Charlotte Solberg (1856–1922) in Lillehammer; Louise Wold (1869–) in Holmestrand; Hulda Marie Bentzen (1858–1930) and Agnes Nyblin (1869–1945) both in Bergen, are only a few worthy of notice. Nyblin developed the firm, when her husband died in 1893, into one of the most influential in Bergen. From 1897 she also worked as a police photographer.

Towards the end of the century the photographic community started organizing to protect their trade. In 1877 the first copyright-law was passed, and in 1882 the first attempt to organize Norwegian photographers was made: Det fotografiske Selskab i Christiania (The Photographic Society in Christiania). The inspiration came from Denmark and it was started for the purpose of promoting interest and knowledge about photography through meetings, discussions and research. Both professional and amateur photographers were welcome. There was also a plan to buy photographs from well-known foreign photographers and arrange exhibitions that could inspire local photographers. One of the leading portrait-photographers, Ludwig Szacinski (1844–94) was chosen chairman, but the association did not last for long.

In 1894 there was a new attempt made and the initiator, portrait photographer Christian Gihbson (1857–1902) was chosen chairman this time. It is clear that at this time Amateurs were seen as a threat. Everyone who "… used photography as a main source of income" could join (Erlandsen 2000, 189). The most important issue at the end of the century was weather photography was art or handicraft. This was important in terms of group identification and education. In 1899 a committee was appointed to elucidate the problem and two years later they concluded that photography should be part of the Union for industry and handicraft.

HANNE HOLM-JOHNSEN

See also: France; and Daguerreotype.

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NOTES AND QUERIES

Notes and Queries commenced as a weekly publication in November 1849, selling at 4d and 5d stamped. It was edited by William John Thoms, a Fellow of the Society of Antiquaries and former contributor to the *Athenaeum*. The purpose of the journal was to provide a cheap and frequent means for the interchange of information in the form of notes between "the artist, the man of science, the historian, the herald, and the genealogist." Aimed at a learned general audience, the principal concern of *Notes and Queries* was the solution of questions concerning genealogy, literary quotations, proverbs, folklore and archaeology. The scope of the periodical was also perfectly suited to appeal to the educated and eclectic gentlemen amateurs who dominated early British photography.

Thoms was a keen amateur photographer with a particular interest in architectural photography. A member of the Photographic Exchange Club, his photographs included pictures of Herne's Oak and of Pevesney Castle. Consequently, for the first five years of its existence, *Notes and Queries* was an important forum for discussions upon the refinement of the various photographic processes. Before the Photographic Society of London and the numerous local photographic societies established themselves, it provided a means for enthusiasts to exchange and disseminate new technical advances. Almost two hundred entries on photography are listed in the index to the first twelve volumes. In its edition of November 4, 1854, the *Athenaeum* noted that "Our contemporary, *Notes and Queries*, seems to be making itself the special organ of photographic discussion and intelligence." Similarly, Thoms himself described the success of the journal in furthering the cause of photography:

> The shadow of a doubt that we once felt as to the propriety of introducing the subject of Photography into our columns, has been entirely removed by the many expressions of satisfaction at our having done so which have reached us. . . (9 October 1852, 347)

The photographic coverage of *Notes and Queries* began in September 1852. Thoms asked his friend and fellow antiquary Hugh Welch Diamond to contribute a series of letters on the archaeological benefits of using photography to record old monuments and buildings. Diamond would later be a founder member of the Photographic Society of London and a future editor of the *Photographic Journal*. Many other notable amateur practitioners contributed to the journal during the early 1850s. These included Philip Henry Delamotte, Frederick Scott Archer, Edmund Kater, Sir William Newton, and George Shadbolt, founding member of the Photographic Society of London and future editor of the *Liverpool and Manchester Photographic Journal*.

The issues raised in *Notes and Queries* were primarily of a scientific nature. Diamond and Delamotte both published details of the different experiments they used for taking collodion photographs. The pages of *Notes and Queries* are thus a valuable guide to the difficulties experienced by early photographers, and their ingenious attempts to solve the problems they faced. However, the advent of specialist photographic journals, along with the establishment of the collodion process, meant that the number of entries on photography declined substantially after 1855.

John Plunkett

See also: Archer, Frederick Scott; Photographic Exchange Club and Photographic Society Club, London; Delamotte, Philip Henry; Wet Collodion Positive Processes; and Wet Collodion Negative.

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NOTMAN, WILLIAM & SONS (1856–1935)

Canadian photographers

In December 1856, William Notman, fleeing arrest in Scotland, opened a photography studio in Montreal. Daguerreotypist Thomas Coffin Doane, in business from 1848, had offered to sell his operation but Notman established a new firm producing ambrotypes, tintypes, and albumen prints. By his death in 1891, Notman had built the most successful nineteenth-century photography enterprise in North America. At its peak in 1874, the Montreal studio alone, with a staff of thirty-seven men and eighteen women, produced fourteen thousand photographs. Notman's specialty was portraiture. Montreal citizens and distinguished visitors, from Sitting Bull to the Prince of Wales, were portrayed in Notman's elegant house style. Notman's was also popular for complex composite photographs, studio tableaux of hunting and sporting scenes, especially in winter, and Canadian landscape views.

An accomplished photographer and skilled businessman, Notman sought out opportunities to position his work prominently in Canada and the United States. His first major commission in 1858 was to document an engineering feat: the construction of the Victoria Bridge at Montreal, a two-mile long tubular steel railway span, the longest in the world. In honour of a visit by the Prince of Wales to inaugurate the Victoria Bridge in 1860, Notman produced the Maple Box Portfolio, a presentation album featuring five hundred photographs and stereographs of Canadian views and bridge construction. Two editions were made: one for Windsor Castle, one for the studio. After the royal family accepted the gift, Notman claimed the title Photographer to the Queen, although there is no documentation that the honour was officially bestowed.

In 1868, Notman opened his first branch studios, in Ottawa and Toronto followed by branches in Halifax and St. John, New Brunswick. While Montreal remained

the base of operations, Notman also pursued opportunities in the United States starting in 1869 with college photographs for Vassar, Harvard, Yale, Princeton, and others. These were printed and compiled into albums in Montreal. In 1875, new postal regulations governing exports to the United States jeopardized the college trade and so in 1877, Notman began opening American branches under the name of the Notman Photographic Company. Permanent studios in Boston, Albany, Newport, and Cambridge were complemented by seasonal studios operated in small college and resort towns for a total of twenty-four branches in North America. In 1876, Notman established the Centennial Photographic Company in Philadelphia to secure exclusive photography rights for the United States Centennial World Fair. Notman's Montreal studio also entered the photographic competition at the fair. One of the judges, German photographer Hermann Vogel, commending the quality of North American photography practices, wrote that "ahead of all stands Notman."

Notman shared his expertise in letters, articles, and photographs with the *Philadelphia Photographer* edited by Edward Wilson. In 1867, for example, he introduced the cabinet portrait format to North America with an article and a sample tipped into the January edition. Another Notman innovation was the first photo-identity card, called a photographic ticket, produced at the Centennial Photographic Company to regulate entry for exhibitors, press, and employees of the 1876 World Fair. Notman studio photographs were also distinguished in the United States as the first to be used in advertising. Travelers Insurance, pioneering the illustrated hanging calendar, commissioned Notman to make composites of the Union and Confederate Commanders for their 1883 calendar, followed by composites of Famous American Authors, Eminent Women, and Famous Editors.

Notman relied on his brothers, John Sloan (1830–1879) and James (1849–1932), other young men he had trained as photographers, and his sons William McFarlane (1857–1913), George (1861–1921), and Charles (1870–1955) to manage studios as he expanded operations. Although women held a variety of positions at Notman's and numbered up to thirty percent of employees, none were photographers. William McFarlane began in 1873 as an apprentice and by 1882 became a partner in the firm. He specialized in view photography and is best known for work done for the Canadian Pacific Railway between 1884 and 1909, photographing landscape along the transcontinental line between Montreal and Calgary and into the Rocky Mountains, and First Nations people in the western provinces and territories. He also photographed extensively in Nova Scotia, Newfoundland, and Quebec.

George apprenticed in Montreal in 1884 and represented Notman's in London at the 1887 Golden Jubilee. In 1890, he moved to Boston and in 1893 left the family firm to establish his own studio in New York followed by one in Boston. In 1900, he returned to Montreal but left the photography industry.

Charles apprenticed in Boston in 1888. He returned to the Montreal studio following his father's death in 1891 and established a reputation for portraiture. In 1894, Charles joined William McFarlane as a partner in William Notman and Sons. On William McFarlane's death in 1913, Charles became sole proprietor. Upon his retirement in 1935, the studio's artifacts were sold to Associated Screen News. These included four hundred thousand prints compiled in two hundred day books from 1860 to 1935, two hundred thousand negatives, employee wages books documenting names, salaries, and employment dates of four hindred employees from 1864 to 1917, and an alphabetical index to the day books. In 1955, benefactors donated these materials to the McCord Museum of Canadian History at McGill University in Montreal where the Notman Photographic Archives, housing the most extensive collection of a single nineteenth-century photography studio in the world, now resides.

COLLEEN SKIDMORE

Biography

William Notman was born in Paisley, Scotland on 8 March 1826. He was the eldest of seven children of Janet Sloan and William Notman Sr. a manufacturer of women's shawls who in 1840 established a dry goods business in Glasgow. Notman received a classical education that included drawing and painting. As a young adult he entered the family business and learned photography although the details of his training are unknown. In 1853, Notman married Alice Woodwark of Gloucestershire, England. Three sons and five daughters were born between 1856 and 1870. In May 1856, Notman fled to Montreal to avoid arrest for illegal business practices undertaken to avert bankruptcy of the Notman firm. His wife and infant daughter joined him three months later. His parents, three brothers, and one of his three sisters followed in 1859. William Notman died of pneumonia in Montreal on 25 November 1891.

See also: Daguerreotye; Wet Collodion Positive Processes; Tintype (Ferrotype, Melainotype)**;** and Albumen Print.

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NUDES

In E. M. Forster's novel, *A Room with a View* (1908), Lucy Honeychurch expressed her rebelliousness by buying a photograph of Botticelli's *Birth of Venus*—this in defiance of her chaperone's warning that "Venus, being a pity, spoiled the picture, otherwise so charming." Almost contemporaneously, in 1910, seven-year-old Kenneth Clark was "expounding" his favourite pictures to his Victorian grandmother. "Unfortunately," he recalled in his autobiography, "I began with Giorgione's *Concert Champêtre*. We were sitting on a sofa near the window and I turned to the page in triumph. 'Oh dear, it's very nude' said my grandmother, and rose from the sofa in confusion."

These episodes show that the nude was an uncomfortable subject in the Victorian and Edwardian periods. In addition, they draw attention to the tension that existed between the aesthetic and erotic aspects of such subjects. In the case of photography, this tension was exacerbated by the realism of the medium, a realism that made it difficult for the viewer to be "diverted ('sublimated') in the direction of art"—as Freud put it in his *Three Essays on the Theory of Sexuality* (1901). Susan Waller (2003) highlighted the problematic nature of photography when she observed that during the Third Republic of France photographic reproductions of paintings of nudes that had been publicly displayed in the Louvre or in the Salon could not be displayed in shop windows, even when the government censorship authority had approved their sale.

Freud's assertion that sexual curiosity might be "sublimated" to become, at least in part, an aesthetic appreciation of the body has proved contentious. "If the nude is so treated that it raises in the spectator ideas or desires appropriate to the material subject, it is false art, and bad morals," wrote philosopher Samuel Alexander in *Beauty and Other Forms of Value* (1933). Kenneth Clark, on the other hand, maintained in *The Nude* (1956): "No nude, however abstract, should fail to arouse in the spectator some vestige of erotic feeling … and if it does not do so, it is bad art and false morals. The desire to grasp and be united with another human body is so fundamental a part of our nature, that our judgment of what is known as 'pure form' is inevitably influenced by it; and one of the difficulties of the nude as a subject for art is that these instincts cannot lie hidden." More recently, Camille Paglia in her highly influential book *Sexual Personae* (1990) insisted on the fundamentally sexual nature of the nude in art; at the other end of the spectrum is Maxim Du Camp's 1863 observation that "art should have no more sex than mathematics." In fact, photographs of the nude may be situated at all points in a spectrum ranging from the chaste to the obscene. Moreover, the character of the photograph may change, depending on the nature of the consumer and whether he was an artist, medical student, scopophiliac or voyeur.

Unknown. Nude with Mirror.
The Metropolitan Museum of Art, The Rubel Collection, Purchase, Lila Acheson Wallace Gift, 1997 (1997.382.45)
Image © The Metropolitan Museum of Art.

Drawing from the nude model was central to the training and practice of artists in the early modern period and remained so in academic art curricula in Europe and North America throughout the nineteenth century. This being the case, it is not surprising that photographers worked from the nude and produced studies from the

nude to be used by artists. In France Eugène Durieu produced nude studies in the 1850s working in collaboration with Eugène Delacroix. During the Second Empire, photographers made large numbers of academic studies of nude models (*académies*) for the instruction of artists. By contrast, Edgar Degas, and Pierre Bonnard**,** at the end of the century, took intimate nude studies of their own companions and models.

In Edinburgh in the 1840s, David Octavius Hill and Robert Adamson produced a remarkable half-length nude study of Dr George Bell holding a studio pose. In England Oscar Gustav Rejlander**'s** combination print *The Two Ways of Life* (1857) contained several nude women, some of whom are shown in flagrantly erotic poses. Although Queen Victoria and Prince Albert purchased a copy of this photographic allegory, it generated considerable controversy at the time. When it was exhibited in Edinburgh, for instance, the nude figures were hidden behind a curtain. In the Victorian period artists' models were presumed to be loose women, and in this instance the suspicion was heightened by the fact that Rejlander had used vaudeville artists as his models. Viewers were also offended by the mistaken assumption that male and female models had been posed together in Rejlander's studio. Rejlaender also made numerous photographs of individual nudes for the use of artists. Almost thirty of these glass negatives are preserved in the National Museum of Photography, Film and Television in Bradford; a portfolio containing nine of these studies was published when the plates were still in collection of the Royal Photographic Society.

Among nineteenth-century American painters, Thomas Eakins made extensive use of photographic nude studies, often posing his students to echo ancient sculpture. Photographs of his male students bathing, used for the painting *Swimming* (1885), are in the tradition of Michelangelo's figure studies for his unrealised mural *The Battle of Cascina*. The homoerotic nature of Michelangelo's male figures was also continued by Eakins's photographs, as was the case with photographs of nude young men taken contemporaneously by Fred Holland Day in Boston and by Wilhelm Von Gloeden at Taormina in Sicily. Von Gloeden combined Mediterranean subjects and subject matter with suggestions of Hellenic love, whereas Day invested his Christian subjects with melancholic eroticism.

Apart the production of artists' studies, there was a huge industry in France devoted to the production of commercial images of erotic, sexually explicit, and obscene photographs of nude models (McCauley 1994). The line between the artistic and the explicit or indecent was often blurred, and could depend to some extent upon the nature of the viewer. Freud provided useful retrospective guidance in this respect when he characterised the "normal" viewer as someone whose interest [could] be shifted away from the genitals on to the shape of the body as a whole." Photographs that focused exclusively upon the primary or secondary sexual characteristics of the nude were often produced as microphotographs and as stereo images; the latter had the particular attraction for the voyeur of enhancing the realistic and tactile qualities of the models. File BB3, preserved in archives of the Préfecture de Police in Paris, contains numerous obscene photographs of nudes and of individuals engaged in sexual acts; this file was compiled during the Second Empire to assist in the identification, classification and punishment of individuals involved in the illegal production of erotic images (Pellerin 2000).

Photographs of naked men and women were also taken for scientific or pseudo-scientific purposes to assist in the recording and classification of information. The accuracy and taxonomic value of photography was exploited in fields ranging from medicine to anthropology and ethnology and even to criminology. In the United States Joseph T. Zealy produced in 1850 a series of fifteen daguerreotypes of first- and second-generation African slaves on a plantation near Columbia, South Carolina. These plates, preserved in the Peabody Museum, were made for the Harvard professor Louis Agassiz to support his research into comparative anatomy and body typing (Phillips 1997). It is significant that the subjects were stripped of their clothing in order to have their bodies recorded for study and classification. This troubling aspect of the plates distinguishes them from photographs of ethnographic subjects, for whom nudity was their natural state. The non-consensual nature of the Peabody plates is a common feature of scientific studies of the nude body. It is noteworthy that Freud linked the concealment of the body to civilization, observing that "The progressive concealment of the body which goes along with civilization keeps sexual curiosity awake." In short, photographing a subject nude was itself a code indicating that the individual belonged to a "lower" or "other" form, one that was separate from normal society by illness, race or behaviour; nudity objectified the "other," whether the figure was an indigenous African, a hysteric, or a criminal convicted of indecent acts.

An especially troubling category of nude photography in the nineteenth century is that concerning child subjects. Middle-class Victorians idealised children, especially female children, as creatures untainted by society, but this romantic view coexisted with the realities of incest and child prostitution, evils that affected the middle classes as well as the poor. Charles Lutwidge Dodgson commented specifically on the naturalness and beauty of the nude female child. Moreover, he famously photographed some of his little girl friends nude. Very few of these photographs survive, and those that do have been coloured (clothed in watercolour, so to speak). Julia

Margaret Cameron also photographed nude children, often "clothing" them as allegories or presenting them as Christian subjects. Had Cameron not been female, her photographs would have caused as much concern among historians as Carroll's. Oscar Rejlander also photographed nude children, employing them to personify Painting and Photography, for instance, and having them echo *putti* in Renaissance paintings such as Raphael's renowned *Sistine Madonna*. It is exceedingly difficult for us in the twenty-first century to view such images without being affected by contemporary concerns regarding paedophilia and child pornography, and it must also have been difficult to do so in the Victorian period. Regardless of whether children are asexual or have sexuality instincts latent in them from an early age (as Freud believed), in a post-Freudian society photographs of nude children exude a disturbing eroticism.

Finally, it is useful to distinguish between the completely and the partially nude figure and to consider what effect the presence of some clothing has on the erotic nature of the image. Freud's emphasis upon the erotic nature of the partly veiled body was echoed not long ago by the French theoretician Roland Barthes. "Is not the most erotic portion of a body *where the garment gapes*?" he asked in *The Pleasure of the Text* (1975). "It is intermittence … which is erotic," he continued, "the intermittence of skin flashing between two articles of clothing." Conversely, the philosopher and legal scholar Thomas Nagel (2002) has argued that concealment and decorum are inseparable and that the exercise of restraint, especially with regard to clothing, is essential to civilized interaction among men and women.

GRAHAM SMITH

See also: Durieu, Jean-Louis-Marie-Eugène; Delacroix, Ferdinand Victor Eugène; Degas, Edgar; Bonnard, Pierre; Hill, David Octavius and Robert Adamson; Rejlander, Oscar Gustav; Eakins, Thomas; Day, Fred Holland; Gloeden, Baron Wilhelm von; Dodgson, Charles Lutwidge (Carroll, Lewis); and Cameron, Julia Margaret.

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NUTTING, WALLACE (1861–1941)

Nutting was born in Rockbottom, Maine, and raised on his uncle's farm by his widowed mother. After quitting school his mother encouraged him to become a minister. Nutting married a widow called Mariet Griswold Caswell during his theological training and was a Congregational Minister until the age of forty-three, when he retired due to Neurasthenia. Not content to just write and travel, he produced antique reproductions of American furniture and took up photography. In his lifetime he produced over a million hand-tinted platinum prints of an idealised country life and its buildings' interiors. Nutting was so successful at one point, that he was employing over a hundred people to assist him in his work. His three volume *Furniture Treasury* was a guide to American antiques, which firmly established the business of antiques within America. The guide was illustrated with more than five thousand photographs of early American furniture, mostly taken by Nutting himself. He produced a series of guide books dedicated to his extensive travels. These books depicted scenes of beauty from both Great Britain and America; for example, *England Beautiful*. He also published, in1924, a book called *Photographic Secrets*. Aside from his books, Nutting established five profit making museums in which to house his photographs and examples of American furniture. Nutting's photographic influence upon America was displayed in magazines such as Country Life, whereby in 1902 a collection of Nutting and Stieglitz's photographs were published together.

JO HALLINGTON

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O'SULLIVAN, TIMOTHY HENRY (1840–1882)

American photographer, probably born Ireland

While little evidence survives regarding the personal life of photographer Timothy H. O'Sullivan, his photographic legacy is extensive. O'Sullivan was a major figure in two areas of early American photography: the documentation of the Civil War and the survey photography of the American West.

From the outset, O'Sullivan's personal life presents more questions than answers. He was born in 1840, probably in Ireland, to parents Jeremiah and Ann O'Sullivan. His family moved to the United States in 1842, as part of the massive wave of immigrants who fled the severe potato famine in Ireland. His birthplace has been mistakenly reported as New York City, because O'Sullivan himself made this claim on a questionnaire when applying for work at the U.S. Treasury Department, but O'Sullivan biographers have determined this to be incorrect.

By the age of 18, O'Sullivan had begun working in Mathew Brady's photographic studio in Washington D.C., which was being managed by Alexander Gardner. The studio, like most in photography's early years, was dedicated to making portraits, but with the onset of the Civil War, Brady turned his attention to the pursuit of field photography. By 1861, Gardner and O'Sullivan both belonged to Brady's "Photographic Corps" which became known for its war views. Late in 1862 Gardner had had a falling out with Brady and left to begin a photographic business of his own. O'Sullivan continued with Brady for a short time longer, but it is thought that when Gardner opened his own studio in Washington in May of 1863, O'Sullivan joined Gardner. O'Sullivan's work for Gardner included copying maps for the Union Army's strategic use, as well as making a variety of views of the war including individual and group portraits of military members and civilians engaged in the war, views of camps, forts, bridges, railroads, buildings, earthworks, towns, fields and plantations, and of changes wrought by the war.

These photographs were published in *Catalogue of Photographic Incidents of the War from the Gallery of Alexander Gardner, Photographer to the Army of the Potomac,* 1863 and *Gardner's Photographic Sketch Book of the War,* 1865/1866. Some of O'Sullivan's most memorable photographs were of the battlefield dead. Perhaps his most famous, *A Harvest of Death,* made at Gettysburg in 1863 and published in *Gardner's Photographic Sketch Book of the War,* shows a field littered with bloated Union corpses. A mounted soldier and the distant hills blur out of focus in the background. Instead of using a standard eye-level viewpoint, O'Sullivan has placed his camera close to the ground, bringing the viewer nearer to the dead men. This low vantage point also causes the battlefield to appear to rake steeply upward, filling more of the picture plane. Rather than aggrandize the heroics of war, O'Sullivan forces the viewer to confront the reality of the war's casualties. Including this powerful image, O'Sullivan made a total of forty-four negatives of the 100 published in *Gardner's Photographic Sketch Book of the War*, most of them landscape views of architecture including forts, bridges, railroad stations, churches, homes and tents employed by the army during the war.

Beginning with his field photography during the civil war, and continuing into his survey photography, Timothy O'Sullivan made glass plate collodion negatives. This method, also known as wet-plate because of the process of coating the glass with wet collodion just prior to exposure in the camera, was particularly difficult when employed in the field. The coating process (as well as the need to develop the negative immediately after

exposure) required field photographers to travel with portable darkrooms, or dark tents. In order to make large photographic prints, large glass negatives were needed, and traveling across the countryside by wagon with chemicals, large wooden cameras, and many sheets of glass made the process of photography quite burdensome by today's standards.

Throughout his career, in addition to single views, O'Sullivan made stereographic views of his war and survey subjects. These stereographs, which were collected widely in Victorian America, display two nearly identical images side-by-side, mounted on a small card.

Designed to imitate human binocular vision, they are best seen in a special viewer, called a stereoscope, which blocks out peripheral vision and creates the illusion of a three-dimensional image. Since these images are created with a special camera featuring two lenses separated by the same distance as human eyes, O'Sullivan had to travel with even more photographic equipment in order to make stereographic views.

In 1867, O'Sullivan was appointed to the Geological Explorations of the Fortieth Parallel by Clarence King, the United States Geologist in Charge. The survey had two explicit concerns: to study the natural resources along the Union and Central Pacific Railroads, and to document the geology of a section of the West one hundred miles wide from the Sierra Nevada Mountains to the Rocky Mountains. Unstated, but implicit in the goals of the survey, was that this research would help to promote the future development of the region by white settlers. This meant identifying possibilities for economic development, recording the local flora and fauna, evaluating the opportunities for mining, and assessing Indian hostilities. For King, as a geologist, this survey was also an important opportunity to produce not just a geological section, but a geological history, which would support his fervent belief in the concept of Catastrophism. This theory asserted that geological features of the earth's surface were created by a series of catastrophic and violent events, such as floods and earthquakes, rather than by slow evolution. King intended for O'Sullivan's geological photographs to illustrate his survey report, and therefore to visually demonstrate Catastrophism.

O'Sullivan had his photographic supplies shipped ahead, and then traveled to San Francisco by way of the Isthmus of Panama. Once there the party gathered in Sacramento, California, and set out on July 3, 1867. The going was arduous—King's men endured steep, snowy mountain passes, hot desert basins, and rough rivers. Most of the men caught malaria, O'Sullivan being one of the few to avoid it. While little has come down to us in O'Sullivan's own words, one of the rare written records of a survey expedition is a story that was published in *Harper's New Monthly Magazine* in September 1869. The article, entitled "Photographs From the High Rockies," does not mention O'Sullivan by name, but scholars believe the story relates his exploits on King's survey. In one colorful episode the article recounts how the photographer's boat became lodged against some rocks while descending the Truckee River, which flows from Lake Tahoe in California to Pyramid Lake in Nevada. Concerned that the boat would be dashed to pieces by debris crashing along in the rough water, O'Sullivan stripped off his clothes and dove into the raging river. From the shore, he maneuvered ropes to free the boat and brought it to safety. This story suggests the danger and adventure that were an inherent part of exploring and photographing the rugged Western country for members of the nineteenth-century survey expeditions like King's.

The first season, in 1867, O'Sullivan photographed in Western Nevada and made his now-famous and otherworldly image of the tufa domes in Pyramid Lake. The King party spent that winter in Virginia City and Carson City, Nevada, and in the former O'Sullivan made photographs of the gold and silver mines, several hundred feet under ground. Not only were conditions unbearably hot, with temperatures reaching more than 130 degrees Fahrenheit, but the darkness of the mine shafts required O'Sullivan to use a magnesium flare to make his exposures. Despite these difficult circumstances, he produced many photographs of miners and the interior of the mines. In 1868, O'Sullivan continued to work in Western Nevada, and also photographed Mono Lake, California, and the Snake River and Shoshone Falls in southern Idaho. O'Sullivan returned to Washington D.C. in the winter of 1868-9 to print his first survey photographs, which were used internally but not published. In fact, throughout his career as an expedition photographer, O'Sullivan never printed in the field. He made negatives as he traveled, and only saw his results later, when he printed back in the East. Also upon his return to Washington D.C. in 1868, O'Sullivan began his courtship of Laura Virginia Pywell, whom he would later marry. By May of 1869 he was back in the West, on his third survey season with Clarence King, photographing the mountains near Salt Lake City, as well as northern Utah, and southern Wyoming.

In January of 1870, during a lull in the surveying while King waited to see if future appropriations would be forthcoming, O'Sullivan photographed on the Atlantic side of the present-day Isthmus of Panama (then the Isthmus of Darien, in the State of Panama in Colombia). This position with a Navy Department survey, whose mandate was to identify a canal route, yielded photographs of the ship and crew, along with some views of native Indian villages, coastline and architecture. The region's dense foliage and the high humidity, however, prevented the topographical views that were the survey's goal. After

O'Sullivan, Timothy H., Print Attributed to Alexander Gardner. Admiral David Dixon Porter on the deck of his flagship the "Malver" after the victory at Ft. Fisher, North Carolina.
The J. Paul Getty Museum, Los Angeles

seven months, O'Sullivan returned to the United States and was replaced by the Navy with photographer John Moran. The change in personnel has caused confusion in attributing the Panama photographs, resulting in many Moran photographs being credited to O'Sullivan.

Lieutenant George Montague Wheeler hired O'Sullivan in September of 1870 to join his survey of the American Southwest, with permission from King, who maintained O'Sullivan on his payroll. Wheeler's expeditions were different from King's in several ways: Wheeler's survey was the only military expedition of the four major expeditions to be conducted in the West, and unlike King, Wheeler appreciated the value of photographs in the promotion of the survey itself. The survey's goals were similar to King's: to prepare accurate maps, document the physical features of the land, find sites for roads and military operations, assess the population and disposition of the resident Indian peoples, and evaluate the geology and vegetation as to their usefulness to settlers.

In May of 1871, O'Sullivan set out from Halleck Station, Nevada with Wheeler's crew, but because he had more seniority in Western surveys than the other explorers, O'Sullivan was often entrusted to head up side trips apart from Wheeler. Lieut. Wheeler led even more arduous expeditions than O'Sullivan had experienced with King. In their first season the survey team endured tremendous heat crossing Death Valley, and Wheeler often forced extended marches that lasted more than a day. The most challenging part of the trip involved traveling more than 200 miles up the Colorado River to the Grand Canyon. The party was divided into three boats: one headed by Wheeler, another by O'Sullivan and a third by Grove Karl Gilbert, the geologist on the expedition. The difficult journey took more than 30 days in all, and in the process Wheeler's boat was destroyed, along with many of his survey notes. Despite the physical challenge of the ascent, O'Sullivan was able to make photographs of the river canyon and of the crew, including the Mohave Indians who accompanied the survey

team. This first season with Wheeler also included an exploration of the mining districts in Nevada, and a period photographing in Northern Arizona. At the end of the survey season, O'Sullivan returned to Washington D.C. to print the season's work.

During the 1872 season, O'Sullivan returned to work with Clarence King photographing in Nevada, Utah, Wyoming and Colorado, but by 1873 was back with Wheeler. The intervening winter allowed O'Sullivan to print two sets of King survey photographs which were sent to the 1873 World's Fair in Vienna, along with other printing for both the King and Wheeler expeditions. On 11 February 1873, while in Washington D.C., O'Sullivan married his longtime sweetheart Laura Virginia Pywell. That year he spent the season in Arizona and New Mexico, making images of the Grand Canyon, and taking perhaps his most famous survey photograph, an image of the White House Ruins in Canyon de Chelly. The Indians settled near Santa Fe and in Arizona also became a primary subject that season. The winter of 1873–4 was again spent in Washington D.C. printing for both King and Wheeler, and in May O'Sullivan began producing official sets of images from Wheeler's survey, which were comprised of both large format and stereographic views. In July of 1874 O'Sullivan embarked on what would be his last season of photography in the West. He began in New Mexico and Colorado photographing Indians and the countryside for Wheeler, and then took a solo trip to a site he had photographed many years before: Shoshone Falls in Idaho. These would be O'Sullivan's last photographs in the West.

Once again the winter found O'Sullivan printing in Washington D.C. but this time that work continued through the middle of 1876. After that little is known about O'Sullivan's work; in 1878 he appears in the Washington D.C. directory as the partner of another photographer, William J. Armstrong, but it seems that venture did not last long. He was on the payroll at the United States Geological Service under King temporarily in 1880, and was the photographer to the U.S. Department of the Treasury from November 1880 to March of 1881, but retired with tuberculosis of the lungs. In September of 1881, O'Sullivan returned to his parents' home in Staten Island, too ill to take care of himself. On 18 October 1881, O'Sullivan's wife died of tuberculosis in Washington, D.C. and he traveled to attend her funeral there, returning to Staten Island. On 14 January 1882, Timothy H. O'Sullivan died on Staten Island, also from tuberculosis, at the age of 42.

REBECCA A. SENF

Biography

Timothy H. O'Sullivan was born in 1840, probably in Ireland, to Jeremiah and Ann O'Sullivan. His family emigrated to the United States in 1842. In 1861 and 1862 O'Sullivan photographed the Civil War for Mathew Brady, but spent the rest of the war working for Alexander Gardner. His war photographs were published in *Photographic Incidents of the War from the Gallery of Alexander Gardner, Photographer to the Army of the Potomac* and Gardner's *Photographic Sketch Book of the War,* 1865/1866. In 1867 he was appointed to Clarence King's Geological Explorations of the Fortieth Parallel and photographed for King in 1867-1869 and again in 1872 in California, Nevada, Utah, Wyoming, Colorado, and Idaho. O'Sullivan spent six months of 1870 with the Darien Expedition, photographing in present-day Panama, but the wet weather and heavy foliage hampered much successful work. That same year he was hired by Lieutenant George Wheeler to participate in his explorations, eventually known as the United States Geographical Surveys West of the One Hundredth Meridian. Between 1871 and 1874, O'Sullivan spent three seasons photographing for Wheeler in California, Nevada, Arizona, Colorado, Utah, and New Mexico. During his time with the western surveys, most winters were spent printing negatives made during the exploration season. 1874 marked his last year photographing in the West, after which he returned to Washington D.C., where he continued to work, including a brief job with the United States Treasury Department in 1880–1881. He left the government position just five months after beginning, due to tuberculosis, from which he died on 14 January 1882, at age 42.

See also: Brady, Mathew; Gardner, Alexander; Survey Photography; War Photography; Camera Design: Stereo Cameras; Stereoscopy; and Wet Collodion Negative.

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OEHME, CARL GUSTAV (1817–1881)

German instrument maker and photographer

Carl Gustav Oehme was born in Berlin in 1817, and trained as a mechanic or mechanical instrument maker. He is reported as having visited Paris in 1840 where he met Daguerre, and learned the rudiments of the daguerreotype process from him, returning to Berlin in 1841 where he was one of the first artists to exhibit daguerreotypes in Germany.

While in France, he met fellow German L. Philipp Graff (1814–1851), an optical instrument maker and later professional photographer, and Graff also contributed daguerreotypes to the 1841 exhibition. Oehme and Graff went on to become two of the most important early photographers in Berlin.

Oehme opened a studio in Berlin in 1843 at No. 20 Jagerstrasse, from where, trading as Gustav Oehme, he produced daguerreotype portraits for many years. He was still using the process into the later 1850s.

Some sources suggest that he also operated a portrait studio in Hamburg 1854/5, but this has yet to be confirmed.

Oehme's surviving daguerreotypes, predominantly 1/6th plate size, evidence masterful control of soft yet directional lighting, and a sensitivity towards posing which gave his group portraits a natural appearance which belies the long exposures necessary.

JOHN HANNAVY

OGAWA KAZUMASA (1860–1929)

Japanese photographer

Ogawa Kazumasa (the characters used in his given name are also read Kazuma or Isshin) was born August 15, 1860, in present-day Saitama prefecture, near Tokyo. He was the second son of Harada Shôzaemon, a samurai and retainer of the Matsudaira clan, and his wife Miyoko. At the age of three Ogawa became the adopted son of Ogawa Ishitarô, a common practice in nineteenth-century Japan.

Ogawa had a strong interest in English, and was first introduced to photography around age 13 through his English tutor, a British missionary. Around the same time he also had a chance to visit the studio of Uchida Kuichi, then the premier photographer in Tokyo, which further piqued his interest. Ogawa became familiar with the wet collodion negative process while serving as an apprentice to the photographer Yoshiwara Hideo for six months during the mid-1870s. In 1877, just seventeen years old, he opened his first photography studio in Gunma Prefecture with a second-hand quarter-plate camera that he used to take carte-de-visite portraits. Despite the limited availability of quality photographic chemicals and supplies, it appears that this studio was quite successful. However, Ogawa closed it in 1880 and resolved to go abroad to further his photographic knowledge.

Ogawa made his way to the United States as a sailor on an American frigate, spending eighteen months in Boston and Philadelphia in 1883–1884. He studied portraiture, carbon printing and plate making, and collotype in Boston. In Philadelphia he studied dry plate techniques and manufacturing with John Carbutt, who developed the first commercial dry plate negative. Ogawa sent news of the latest advances in American photography back to Japan, where they were published in *Shashin shimpô* (*Photographic News*), Japan's first photography periodical. He also shipped dry plates, which were just starting to be used in Japan around this time. The information he conveyed to other Japanese photographers experimenting with dry-plate technology was instrumental in helping them successfully master the technique.

After returning to Japan, Ogawa established a studio in Tokyo in 1885 called the *Gyokujunkan*, and thereafter rapidly became involved with a number of innovative photography-related businesses and projects. Ogawa had several appointments and commissions that gave him access to an unusually wide range of subjects. In 1886 he was appointed photography instructor for the army, in a division that was then part of the Land Survey Department. In 1888 he participated in a survey of Japanese cultural assets under the auspices of the government. His affiliations with the military and the government enabled him to photograph such varied subjects as the Sino-Japanese War, the Russo-Japanese war, the aftermath of the Boxer Rebellion, the palace buildings of the Forbidden City, Beijing, and antique sculpture, paintings, and architecture of ancient temples in Kyoto and Nara. His style was also varied, ranging from straightforward documentary photographs to beautifully composed artistic images that prefigured a modernist aesthetic.

Perhaps even more noteworthy than the diversity of his subject matter, however, was his influential role in developing photographic printing techniques within Japan and in promoting a domestic photographic

industry. In 1888 Ogawa, Kajima Seibei, and William K. Burton, an amateur photographer and a professor of engineering at Tokyo Imperial University, formed the *Tsukiji Kampan Seizô Kaisha* (Tsukiji Dry-Plate Manufacturing Company), one of Japan's earliest commercial dry-plate manufacturers. Although it folded several years later, Ogawa continued to support other domestic dry-plate companies. He then established Japan's first photoengraving company, *Ogawa Shashin Seihanjo* (Ogawa Plate-Making Shop) in 1889. Through the Ogawa Shashin Seihanjo, he became a prominent publisher and produced numerous books featuring high quality collotype images. Ogawa himself took many of the photographs. Among the earliest items published by the Ogawa Shashin Seihanjo was Japan's first art magazine, *Kokka* (National Essence), still in production today. *Kokka* focused on traditional Japanese art and early issues reproduced Ogawa's classic images of Japanese Buddhist sculpture taken as part of the 1888 survey of cultural assets.

Significantly, Ogawa's books were largely directed towards a Western audience, and consequently he played an enormously important role in exposing Japan to the West as it emerged from two and a half centuries of isolationism. Most of his publications included English language captions and information, sometimes combined with Japanese text; many were so popular that they were printed in multiple editions. Typical topics were scenic or general themes that appealed to Westerners' curiosity about Japan. Some sample titles are: *Illustrations of Japanese Life*, with collotypes of people engaged in various daily activities, issued in multiple editions between 1892–1918; *The Charming Views in the 'Land of the Rising Sun* (1904), with 174 black and white photographs covering all areas of Japan including Formosa (Taiwan) and Korea; and *Photographs of Japanese Customs and Manners*, with several editions published around 1900. Flowers were another common subject and Ogawa released titles such as *Lilies of Japan* and *Chrysanthemums of Japan*. The full-page color collotypes of flowers he contributed to the multi-volume work *Japan, Described and Illustrated by the Japanese*, published by J. B. Millet Company in the late 1890s, are among his best-known work. And of course there was the perennially favorite theme of geisha. In 1891, Ogawa was commissioned to photograph 100 local geisha to celebrate the opening of the *Ryôunkaku* or "Asakusa Twelve Stories," an amusement center in the tallest building in Tokyo. These images as well as other portraits of geisha were incorporated into various editions released over the next decade, including *Types of Japan, Celebrated Geysha of Tokyo* (1892); *Celebrated Geishas of Tokio* (1895); and *Geisha of Tokyo* (multiple versions, 1898–1902).

Ogawa's other activities included being a founding member of Japan's first amateur photography association, *Nihon Shashinkai* (the Japan Photographic Society) in 1889. The same year he established a second version of *Shashin shimpô* (the first version, mentioned above, had ceased publication in 1884) and served as editor until 1896. He became the first Japanese photographer to be nominated as a fellow of the Royal Photographic Society of England in 1895, and was the first photographer appointed as a member of the Japanese Imperial Art Academy in 1910.

Ogawa was well regarded during his lifetime, widely recognized for his innovation in establishing new photographic technologies in Japan. Based on his influence on the Japanese photography industry, the many activities in which he was involved, and his reputation as a superb photographer, Burton described him as "the greatest authority on photographic matters in his country" (Burton, 1894, 185). In 2004 he continues to be regarded as a pivotal figure and a pioneering entrepreneur in Japanese photographic history. His work is in the collections of Nagasaki University and the Tokyo Metropolitan Museum of Photography.

KAREN FRASER

See also: Uchida Kuichi; Wet Collodion Negative; Carte-de-Visite; Collotype; Carbutt, John; Dry Plate Negatives: Gelatine; Dry Plate Negatives: Non-Gelatine, Including Dry Collodion ; Burton, William Kinninmond; Photographic Exchange Club and Photographic Society Club, London.

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OLIE, JACOB (1834–1905)

An animated nineteenth-century amateur photographer in Amsterdam

To Jacob Olie photography was a pursuit which he practised intensively in his youth and again in later life after an interlude of 25 years. Olie was originally trained as a carpenter and took lessons in drawing and in theoretical

subjects at a private technical school. At the age of 16 he joined the Maatschappij tot Bevordering der Bouwkunst (Society for the Advancement of Architecture) and in 1855, he and a small group of kindred spirits founded the society Architectura et Amicitia, a debating club where the international magazine portfolio brought news of developments in the arts, the natural sciences and technology. It was in these circles that Olie received further theoretical training and his wider cultural interests were shaped. He translated sections of E.E. Viollet-le-Duc's *Entretiens sur l'architecture* and lectured on *Grammaire des arts du dessin* by Charles Blanc, former director of the Paris École des Beaux Arts. During the years he also participated succesfully in many competitions for artistic architectural designs.

The first time the word 'photography' was mentioned at one of the society's meetings was by Olie in 1857. He cited a report from a Dutch periodical about the Architectural Photographic Society that had been set up in London with the aim to provide its members with reasonably priced photographic illustrations of 'noteworthy' buildings from all countries. The matter came up once again, but Olie received little response among his fellow members for his proposal to collaborate with the English and exchange photographs for measured drawings.

For architects the photograph and the drawing were not comparable media. For someone like Viollet-le-Duc, drawing was a higher form of seeing, despite the importance he attached to photography as an aid in restoration. However, at the weekly art reviews more and more photographs were shown. In 1859 Olie brought along a series of stereoscopic views of Amsterdam by Pieter Oosterhuis. Shortly thereafter, he began himself experimenting with the art of photography.

Olie probably took his first photographs in the summer of 1861, only a few months after he had started his career as a teacher of architectural drawing at the technical school. At that time there were enough publications available with technical instructions for would-be photographers. In his notebooks Olie copied recipes for collodion, which he had taken from E. Robiquet (*Manuel théorique et pratique de photographie sur collodion et sur albumine*, 1859) and A.A.E. Disdéri (*L'Art et la Photographie*, 1862), among others. Olie built his own camera, a simple model, similar to the earliest daguerreotype cameras, which could take glass plates of 10.5 × 12.8 cm which he cut himself from window glass.

That first summer Olie explored the utterly familiar world of the busy dockland and industrial area where he was born and where he still lived among his extended family of craftsmen, ship-builders and timber merchants. Here he took scenes not normally recorded by commercial photographers: a ship under construction, a mast-makers yard, or views taken from the deck of a ship.

In 1862 Olie equipped his camera with a new lens of sharper definition and took up portraiture, a genre which he had never attempted as a draughtsmen. He made more than 150 portraits of his family, friends and acquaintances, sometimes capturing them in their own environment, and on other occasions against an artificial backdrop of cloths, rugs and props, like those used in the professional portrait studio. Sometimes Olie moved his darkroom equipment to friends and relatives who lived in the city centre and photographed from their attic windows. In some cases the views he made from these high vantage points can be fitted together to breath-taking panoramas. They provide a unique and highly personal portrait of Amsterdam's city centre. Unlike his drawings, Olie never submitted his photographs to exhibitions, but in 1864 and 1865 he presented his albumen and salted-paper prints to his colleagues at an Architectura et Amicitia meeting. Soon after, he abandoned his photographic experiments for many years.

Olie would only return to photography after his retirement as headmaster of the technical school in 1890. By then, he was a 56-year-old widower with four young children ranging from four to eleven years of age. He still used the same camera but fitted with a new lens. Olie built a number of ingenious cassettes which he could load at home with ready-made dry-gelatin plates of 9x12 and 13 × 18 cm. In the intervening years, his interest in photography had not waned. Olie gave slide shows for his pupils and others audiences with the magic lantern. The teacher in him recognized the educational potential of the picture machine and it may well have inspired him to produce his photographs specially for it.

Between 1890 and 1904 Olie took over 3600 photographs, most of them portraying the city of Amsterdam, including street scenes and residents and workers in their own surroundings. Amsterdam was in the process of rapid transformation and Olie recorded construction works at different stages of completion, moving about the building sites freely as he knew the architect, the client or the building contractor. Often his views are not topographical in the strictest sense, but the city serves as a backdrop for public events—military parades and balloon lift-offs, visits by dignitaries and ship launchings. He continued to display a predilection for high viewpoints in this period, even when it was no longer strictly necessary.

What fascinated Olie was the new architecture within its urban context. Unlike some artists of his day, he was not charmed by decay. Although the painter-photographer G.H. Breitner and Olie were both admirers of Amsterdam's beauty, they produced quite distinct bodies of work. While Breitner reinforced the shabbiness of the old districts and evoked the dank atmosphere of decay,

Olie composed views in which old and new fused into an organic whole. Olie's photography is also very different from that of the younger generation of pictorial photographers who sought to render the 'soul' of the city in atmospheric photographs. Employing refined photographic processes, they would often blur the city's contours in their hand-crafted prints. In contrast, Olie's photographs are lucid images of a tangible world.

After the turn of the century, Olie began to use a modern, hand-held camera which could take several 9 × 12 cm glass plates. It gave him a new mobility and allowed him to work in a more casual manner. Olie and his family were zealous hoarders. Besides the thousands of photographs, negatives and drawings he left behind, a veritable mountain of personal material has been preserved. The Amsterdam city archives purchased this rich legacy from his heirs in two portions, in 1959 and 1990.

Anneke van Veen

Biography

Jacob Olie was born on 17 October 1834 in Amsterdam, from a long line of raftsmen and whalers. Trained as a carpenter and an architectural draughtsman, he taught drawing at the first technical school in Amsterdam from 1861 on, and in 1868 became its headmaster. As a member of the leading architectural societies in the Netherlands, he studied zealously architectural and art history and played an active role in the debates on architectural theory and the concepts of form. He practised and demonstrated his skills in drawing and design in many competitions. In 1861 Olie started to photograph with a daguerreotype-model camera which he had built himself, using wet-collodion plates. The next four years he portrayed the dockland and industrial area where he was born and still lived, choosing unusual subject matter. He also made many portraits of his family, friends and acquaintances, and used their homes in the city center to set up his darkroom equipment and photograph the views from their windows which in some cases can be fitted together to large panoramas. Pressure of work forced him to abandon his pursuit. After his retirement in 1890 Olie took up photograpy again, this time on industrial dry-gelatine plates. Until the age of 70, Olie worked at fever pitch, producing some 3600 photographs of Amsterdam, outlying areas, and the wide surroundings. He was particularly interested in the transformation of the capital into a modern city, focussing on new architecture as an organic part of the urban context. He never exhibited his photographs, but projected them as lantern slides to a wide audience. Jacob Olie died in Amsterdam on 25 April 1905. His rich legacy is kept at the Amsterdam city archives.

See also: Architecture; Domestic and Family Photography; History: 5. 1860s; History: 8. 1890s; Lantern Slides; Netherlands; and Topographical Photography.

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OOSTERHUIS, PIETER (1816–1885)

Topographical and industrial photographer of the Netherlands

When the artist Pieter Oosterhuis took up photography he had passed the age of 35, newly married moreover, and determined to maintain his family from the earnings of his Atelier Photographique et Daguerréotypique.At last, he had come out of the shadows of his father, the successful painter and illustrator Haatje Pieters Oosterhuis. At the time of the opening of his first studio over 240,000 people were registered in Amsterdam, while the number of studios was only six, which was very few compared with cities like Hamburg and Berlin. This reveals a sense of adventure and a talent for entrepreneurship in Oosterhuis, which impression is intensified by the fact that he was probably one of the very first to apply the stereo technique in the Netherlands.

Stereo photography had been presented to the Dutch public for the first time in 1855, at the International

Exhibition of Photography in Amsterdam. The overwhelming success must have inspired Oosterhuis to introduce the novelty in his portrait studio and to apply it also to topography. This brought out the best in him. The Dutch cityscape would become one of Oosterhuis's major genres for the next 25 years. The genre of the topographically precise cityscape is rooted in a long-standing north-Netherlandish tradition in drawing and printmaking. Oosterhuis photographed the views which topographical artists had depicted before him. Restricted to a picture plane of barely seven by seven centimetres, he succeeded in composing remarkably powerful images by adapting skilfully the proven compositional schemes.

There was a growing public for Oosterhuis's stereographs. Increased tourism and a greater urge to travel made the publication of stereoscopic views a profitable undertaking. In the early years Oosterhuis did not experience much competition from his own countrymen who catered for the local market. The Parish publisher Alexis Gaudin & Frères issued the series *Hollande* in 1858 with 71 views of Amsterdam, Rotterdam, The Hague, Haarlem and Dordrecht. These cities were linked by rail from 1847 and every tourist took them in on his tour of the Netherlands, in pursuit of the landscapes portrayed by famous Dutch 17th-century masters. In the following years, Oosterhuis had the tourist trail in the provinces of Holland and Utrecht entirely to himself, uncontested even by the French company of Adolphe Braun, whose son Gaston did not visit the Low Countries until 1864.

After a short-lived collaboration in 1858 or 1859 with an Amsterdam bookseller and publisher, Oosterhuis published the bulk of his stereographs himself. No publisher is given on his large collection of almost four-hundred views, sold as *Vues de Hollande* in the early 1860s. Following the introduction of the larger cabinet size for portraits in 1867, Oosterhuis brought out new series of cityscapes. He continued to make them until the end of his career and after his death his son Gustaaf carried on. From the 1870s on virtually all professional photographers made tourist views. To withstand this fierce competition Oosterhuis felt compelled to produce extensive photographic coverage of Amsterdam and other places in order to diversify his supply.

By that time Oosterhuis's career as a portraitist had come to an end. In 1869 he sold the establisment and devoted himself entirely to his topographical series as well as to a new branch of the profession. December 1858 saw the appearance of the first Dutch publication to be illustrated with "a photograph from nature": inside the *Praktische Volks-Almanak* an albumen stereograph by Oosterhuis was pasted, showing Dam Square in Amsterdam. Following the *Revue Photographique* of 5 March 1858 the author of the accompanying article quotes the example of a New-York engineer who contracted a photographer to record the daily progress of building projects spread throughout the United States. The photographs furnished the engineer with all that he needed "to direct construction from a distance." And, the author asked rhetorically: "Would a Dutch photographer be capable of an achievement like this?"

October 1861 Oosterhuis began photographing the excavation work for a new lock near Amsterdam. It was the first assignment of its kind in the Netherlands, soon followed by a second in the remote province of Zeeland. A bill of 1860 established a nationwide railway network at public expense. To the newly emancipated group of civil engineers it brought a whole new field of activity and a chance to distinguish themselves in prestigious projects. These developments contribued to the decision to systematically document the construction of public works with the aid of photography, culminating in 1869 in a ministerial decree to make this practice compulsory.

Between 1861 and 1884 Oosterhuis undertook twelve large assignments commissioned by central government departments. He found himself gazing down on immense construction sites, where he had to familiarize himself with a new landscape photography. The *Tijdschrift voor Photographie* devoted ample space to Oosterhuis's Zeeland photographs in 1864 and 1865 and praised Oosterhuis's "artistic sense." The nature of the industrial assignments demanded a larger format than was customary for tourist photography. Oosterhuis worked with a variety of cameras, ranging from a camera for plates measuring roughly 18 × 26 cm on his first assignments, to the largest which produced images of over 32 × 42 cm. His fellow photographers admired the outstanding sharpness and the "wide field of vision" of these landscapes, which were taken with an orthoscopic lens on dry collodion plates. Oosterhuis was well-known for his immense precision, never exposing more than one single plate for each commissioned view point.

Like all photographers of his generation Oosterhuis was forced to diversify. He worked also on assignments from the industry, private societies, and the Amsterdam local authorities. At the International Photographic Exhibition of 1877 in Amsterdam, where he was awarded the Gold Municipal Medal, he submitted engineering photographs, landscapes and cityscapes, "views and cloud studies," and dry plate negatives, in addition to art reproductions in carbon print and silver print. Two years later, no less than 64 photographs by Oosterhuis were incorporated in the *Patriotic Album*, a "welcome greeting" from the nation to Princess Emma, King Willem III's young bride. After this milestone in his career, the latter years of his life were less prosperous. Oosterhuis suffered from tuberculosis and his youngest son Gustaaf became more active. After his father's

death, Gustaaf continued the firm under the name "P. Oosterhuis" until 1936.

ANNEKE VAN VEEN

Biography

Pieter Oosterhuis was born on 20 January 1816 in Groningen, the son of an artist. Trained as a painter by his own father, he took up photography in the early 1850's. In 1852 he opened the sixth daguerreotype studio in Amsterdam. Four years later he marketed his first stereoscopic views on glass and on paper. Until his death Oosterhuis published his cityscapes "in their thousands," initially as stereographs, later as cabinet cards, establishing himself as the *homo topographicus* of the Netherlands *par excellence*. In addition to these tourist photographs, Oosterhuis worked on engineering assignments from the central government. During more than twenty years he photographed nationwide the modern landscape and geometric forms of railways, railway bridges, station buildings, canals, locks, and docks under construction. He developed a vocabulary for these landscapes which bears a striking resemblance to French, British, or even Russian engineering photographs of the period. By his contemporaries he was esteemed the first among the Dutch landscape artists. As a painter he was a member of the artist association Maatschappij Arti & Amicitiae, but later he joined the Amsterdam Photographic Society. In the 1870's Oosterhuis regularly published articles on technical issues in the photographer's magazine *Tijdschrift voor Photographie*. At the 1877 Exhibition of Photography in Amsterdam Oosterhuis was awarded the Gold Municipal Medal. After his death on 8 June 1885, his youngest son Gustaaf (1858-1938) continued the firm.

See also: History: 4. 1850s; History: 5. 1860s; History: 6. 1870s; Industrial Photography; Netherlands; Societies, groups, institutions, and exhibitions in the Netherlands; Topographical Photography; and Tourist Photography.

OPPENHEIM, AUGUST F. (active 1850s)

German photographer

It is conjectured that the German photographer August Oppenheim was born in Dresden. Around 1852 he was instructed in the art of photography and, more specifically, in the calotype method, by Gustave Le Gray. A year later, during the course of a photographic tour, he visited Greece and recorded the antiquities, with the aim, as he wrote, "to give to those who had not been fortunate enough to see these monuments with their own eyes a clear idea of them, and to others pleasant memories." Details of this journey, as well as of the difficulties he encountered, he published in the periodical *Lumière* (issue 6, April 1853). His intention was to publish, on his return to Dresden, a three-volume work. In the end, this was limited to two volumes under the titles respectively of *Die erhaltenen griechischen Tempel auf der Akropolis* and *Details der Akropolis*. These photographs of his were finally included in *Atheniensiche Alterthümer*, published in 1854. An important honourable mention was awarded to him for the photographs he exhibited at the Industrial Fair in Munich.

ALIKI TSIGRILAOU

OPTICS: PRINCIPLES

The ability to manipulate light dates back to ancient times. The understanding of the nature of light, which involved debates over whether it is composed of waves or particles, began in the 1500s and 1600s. The discovery of and the elaboration of principles needed to design optics with confidence began in the early 1800s.

It seems quite likely that reflections in calm lakes and ponds were seen and wondered at since the dawn of human existence, perhaps millions of years ago, but no trace remains. The earliest optical devices we have found are stone and obsidian mirrors from the Bronze Age in Europe and the Middle East. It is likely that at about the same time people noticed their reflections in the blades of metal swords, axes and armor if they were highly polished. Flat mirrors reflect light at the same angle as it is incident at, and the formation of an image takes place in the eye of the beholder. A mirror can concentrate light if its surface is made concave. There are Greek accounts of Archimedes' "burning mirrors" being used to ignite the sails of Roman ships in battle, using concentrated solar energy. These mirrors were made of polished metal. A helmet or breastplate, being convex on its outside, spreads light and, if of high enough quality, forms a reduced-scale, wide angle image, rather than a concentration of light or a magnified image.

Transparent materials transmit light and can also manipulate it. We find glass jewelry which spreads light into colors, a property called dispersion, from the Bronze Age on, and this was undoubtedly long predated by the discovery that natural crystals such as quartz, calcite, amethyst, and emeralds, created colorful dispersal and multiple reflections of light. And again going back to early human times our ancestors saw and must have wondered at the colors of mother-of-pearl, rainbows, sun-dogs, lunar halos and other natural phenomena.

Small apertures in opaque surfaces when illuminated from one side will form images on a surface placed on the opposite side. This phenomenon was remarked in classical Greek times, dating back to 250 BC. It allows

one to safely view a partial solar eclipse in shadows and images cast on the ground by a leafy tree.

All these phenomena can be explained based on the nature of light and its behavior in different materials and at material boundaries. If a material is internally uniform in density and transparency, then light travels through it in straight lines and only changes direction, or refracts, at the boundary to another medium. At each boundary the path direction changes, and the angle of change (with respect to a perpendicular to the surface at the penetration point) is called the angle of refraction. If the surface is flat, the light entering it at a given angle is refracted the same amount everywhere on the surface. If the surface is curved, then the angle of refraction varies over the surface. If the shape is part of a sphere, the piece is said to be a lens and it can focus or defocus light, depending on whether the surfaces are convex or concave. (It should also be noted that at each boundary between different materials a fraction of the light is reflected: for glass and air it amounts to about 4%, and can give rise to multiple internal reflections inside lenses or rear-surface mirrors.)

The angular amount of refraction of a material is measured by a number unique to each material, called the index of refraction, the ratio of bending in a material to that of empty space, which is set equal to one. Air and other low-density gases have indices of refraction just a bit larger than one. Water at sea level has an index of refraction of 1.33, natural crystals, glass and plastics generally fall in the range 1.25 to 1.8. Some relatively exotic composition glasses have indices of refraction well over 2.5, which means lenses made out of them can be of thinner material and still bend light as much as thicker lenses made of lower index glass. (An aside: Einstein's relativity shows that, in the presence of matter, space itself curves and thus light's path in space is curved proportionate to the distance and density of that matter. It shows up in astronomy in curved arc images of distant galaxies seen around massive foreground galaxies. This effect is ignored in classical optics and so far has found no application in conventional photography!)

Lens making became a profession in the late renaissance in Europe. The Dutch optician, Snell (1580-1626), discovered and published a short mathematical relation for the bending of light in 1626, by sending light beams through glass surfaces of varying shapes and indices of refraction and carefully measuring the angle of incidence of the light as it struck the glass, and then the angle it was deviated to inside. He also measured the angles at the light ray's emergence on the far surface, into the air.

Snell's law is: $n_1 \sin \theta_1 = n_2 \sin \theta_2$.

In words that is: the index of refraction of light in the first medium times the sine of the angle of incidence at the boundary is equal to the index of the light in the second medium times the sine of the angle of refraction in the second material. The unprimed numbers are the numbers in the first medium, the primed numbers refer to the second medium. The Greek letter theta (θ) refers to the angle in degrees. Recall that the sine of an angle is a trigonometric property and can be found in mathematical reference tables or calculated by hand or computer. Since by its definition, the sine of any angle between zero degrees and 90 degrees is somewhere between 0 and 1, and since the index of any ordinary transparent material is greater than one, a light ray entering glass from air will be bent to a smaller angle than the angle of incidence it had at entry. When a ray leaves the denser material, passing from glass to air, the ray will bend back to a larger angle.

Snell's law was empirically derived. It can be derived theoretically using the electromagnetic wave theory of light founded by James Clerk Maxwell in the 1860s, and also by Fermat's principle of least time of travel. The latter idea relies on the fact that the index of refraction is not only a measure of bending strength but also the ratio of the *speed* of light in a material to that in empty space.

Snell's law and a little further work led to a useful formula, still applicable with certain restrictions, for describing practical optical systems. It is called the lens maker's formula:

$$1/\mathrm{fl} = (1/\mathrm{OD}) + (1/\mathrm{ID}).$$

The OD is the distance from the object in question to the center of the lens, the ID is the distance from the lens center to the focused image, and fl is the focal length, the distance from the lens center to the focused image when the object is at infinity. The focal length is also, by definition, one half the radius of curvature of the lens surface. It should be noted that this formula can be repeatedly applied to follow light through a series of lenses. With proper observation of positive and negative sign conventions it can also be used to study mirrors. The restrictions are that the lens have a shallow curvature, or equivalently that it has a very long focal length compared to its diameter. And light rays are assumed to travel in straight lines except when they cross material boundaries. This is called the Thin Lens Approximation. The lens maker's formula is a shortcut of use in deciding where an image will focus for an object at a given distance using a lens of known focal length, or for a quick design of a simple optical system. This formula also can be used to get the image magnification, which is the ratio: M= ID/OD.

Aside: Fresnel (1788–1827) in the early 1800s garnered a large prize fund from the French Academy of Science by designing a very thin lens, for use in lighthouse lights. These were used successfully for that purpose but now find much larger use as lenses for

theatrical spotlights, in camera viewfinder focusers, and also as novelty wide-angle lenses for automobile rear windows. Think of taking a set of nested concentric circular cookie-cutters and slicing a lens into a series of rings. Then shave off the bulk of the glass in the rear, leaving only the front curvature. Cement the resulting rings to a thin flat sheet, and the result is like a Fresnel lens (which is actually molded). This is a really thin lens!

Using the Thin Lens Approximation and simple geometrical rules, it is possible to quickly draw the principle light paths in a lens system. For each lens, a light ray down the system axis (a perpendicular through the lens center) travels straight on. A ray parallel to the axis, emerging from an off-axis point of the object as if it came from infinity, is bent by the lens to pass through the rear focal point, and a ray passing from the same object point through the front focal point (at an angle) emerges from the lens parallel to the axis (note the symmetry!). Where the latter two rays cross is the point where the original point of the object is imaged. In cases where the image rays converge to a focus, the image is termed real.

If, in leaving the lens, the rays only diverge, then an image can only be seen by the use of an additional lens, say that in your eye, and the image is called virtual. Convex lenses and concave mirrors can give real or virtual images, depending on whether the object is closer or farther than one focal length away from the optic. Concave lenses and convex mirrors yield only virtual images.

Snell's Law, which describes the refraction of light, along with the law of reflection (the angle of incidence equals the angle of reflection), can be applied at each point of a boundary surface to predict the path of light rays as they pass through. By doing this step by step at all points (or a sample) of a surface of known shape, one can follow a ray of light through a system of any complexity, and in reasonable detail. This process is called ray tracing, and until the advent of computers was carried out by hand. There some complications to this process, however.

First, the index of refraction of any real transparent material varies with the color (wavelength or frequency) of light. This effect is called dispersion, and explains why prisms are able to spread white light out into the visible spectrum. In general the index is greatest in the blue and diminishes continuously into the red and infrared. Mirrors do not suffer from this problem. This effect causes any lens to send blue rays to a different focus point than green or red ones. The result is called chromatic aberration, and results in color fringes surrounding images of objects with sharp edges, such as the Moon. It was discovered in the middle 1700s that this problem could be removed by sandwiching together two lenses of different indices of refraction, one convex and the other concave, carefully choosing their focal lengths, to make the dispersion of the second approximately cancel that of the first. These pairs are called achromatic lenses. All modern lenses for cameras and telescopes are achromats.

Second, every lens or mirror has a natural limit to resolution caused by the wave nature of light, called the diffraction limit. Waves bend around any edge, straight, curved or jagged. This is termed diffraction. Light does this and this results in fuzzy shadow edges (visible under careful examination) and also fuzziness in the whole image. The larger the opening of the lens or mirror, the less important this is and the sharper the image. The longer the wavelength of light (the redder it is) the worse the effect. This diffraction limit can not be evaded in conventional optics.

The diffraction effect can actually be put to use, however. A simple round pinhole carefully made in an opaque sheet will give a real image on almost any size surface behind, at almost any distance. What you gain in areal coverage and depth of focus you sacrifice in speed and exposure time. In conventional optics (lenses or mirrors)the aperture is wide and concentrates a lot of light. In pinhole cameras, just a tiny amount of light passes through. A conventional "fast" lens might have a focal length to diameter ratio ("f/stop" or "speed") of f/1.2 or f/1.8. The speed of a pinhole is usually f/150 or more.

Aside: A more efficient way than a pinhole to use diffraction to manipulate light and form an image is a second invention of Fresnel: the zone plate. Fresnel found an exact formula to compute the widths of transparent gaps between and widths of concentric opaque rings to form a lens based on diffraction. A zone plate looks just like a bullseye, but it is a mathematical construct.

There are also distortions of image shape due to lens or mirror shape. If the surfaces are spherical then off-axis rays do not focus at the same distance as on-axis ones. Spherical aberration, along with comatic aberration (images at the edge of the field of view spread out into fan "tails" like comets), barrel distortion and pincushion distortion (rectangular objects have "swollen" or "collapsed" images, respectively) along with chromatic aberration all have to be reduced to make an optical system produce high quality images. With the use of ray tracing in modern computers all of these problems can be solved.

Compound lenses have been designed for many different purposes. Perhaps the two greatest challenges are to find excellent wide angle lenses, and to find zoom lenses which maintain focus and image quality, along with maximum speed at every magnification. Again computers have allowed many different solutions to these problems.

If one surface of a compound optical system can be made to change shape microscopically and the image sharpness can be sensed instant by instant, you can use computer control to integrate this information and "sculpt" the flexible surface to make ultra sharp images in real time. Such star "de-twinkling" systems ("rubber" mirrors) are now available for astronomers and can make earth-based telescopic images almost as sharp as those made from Earth orbit. But they are not yet available for ordinary commercial cameras. However, overall motion compensation ("de-jiggle") is here in binoculars and some digital cameras. It may not be long before it appears in film cameras too.

Holography, the making of 3-dimensional images using laser light, can use or dispense with lenses and mirrors to achieve focused images. The images are formed by preserving the distance, brightness and color information carried by light waves, in the form of microscopic interference patterns, which are recorded on super-high resolution emulsions. Only laser light has the color purity and wave orderliness to form stable interference patterns, and all motion must stop for the duration of the exposure, down to a millionth of an inch, to avoid blurring out the interference pattern.

Holograms can, however, be made of small moving objects if the laser can emit a very intense short flash. Holographic large-scene snapshots are not yet on the horizon.

WILLIAM R. ALSCHULER

See also: Lenses: 1. 1830s–1850s.

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ORIENTALISM

The term Orientalism was particularly used in the 19th century often as a facet of Romanticism to refer to the depiction of the Near and Middle East, primarily by western artists. Images of history, everyday life, monuments, landscapes, portraits, etc. depicting the life and culture of the geographic region that included modern day Turkey, Syria, Iraq, Iran, the Arabian peninsula, Jordan, Israel, Lebanon, Egypt, Libya, Tunisia, Algeria, Morocco, and sometimes modern Greece, Albania, and Sudan, constituted the realm of Orientalism.

In the 19th century the lure of the exotic, the mystique of the lands of the "Arabian Nights," the "Other" of unseen landscapes and unexperienced cultures, and the adventures of travel to new frontiers, all contributed to the growing popularity of Orientalism in painting, sculpture, and photography. Eugène Fromentin wrote in 1859, "The Orient is exceptional…it escapes general laws…This is an order of beauty which, having no precedents in either literature or art, immediately strikes us as appearing bizarre. All its features appear at once: the novelty of its aspects, the singularity of its costumes, the originality of its types, the toughness of its effects, the particular rhythm of its lines, the unaccustomed scale of its colors…It is the land of…inflamed landscapes under a blue sky, that is to say brighter than the sky, which constantly leads…" (Eugène Fromentin, *Une Année dans le Sahel*, ed. Elisabeth Cardonne, Flammarion, Paris, 1991 (1859) pp. 184–85.)

Orientalism frequently implies travel, in actuality, or simply from one's armchair, evoking deep seated colorful and/or steamy reveries, that inspired artists as they attempted to trace the trails that led to new geographic vistas, and to new realms of the imagination. The Orient was to become "unveiled" in images that were both accurate and inauthentic as artists and photographers worked "in situ" and in studio settings, often conflating dream and reality, truth and fiction.

In more recent years writers such as Edward Said in his 1978 *Orientalism* or Linda Nochlin in her 1989 essay, "The Imaginary Orient" (in *The Politics of Vision: Essays on Nineteenth Century Art and Society*, New York, 1989, 33–59) have argued that the Orient was a "creation of the West" and that many images represented aspects of Western domination and imperialism. Thus, in viewing "Orientalist" photographs, it is important to consider issues such as: why and how various photographs were taken; the role of individual and national power; the role of large format images, albums, and postcards; Colonialism and Post-Colonialism; documentary, propaganda, and artistic elements.

One of the most important publications in the early development of Orientalism was the French government's *Déscription de l'Egypte* (Paris 1809–22), 24 volumes illustrating the monuments, people, flora, and geography of Egypt following Napoleon's campaign in Egypt. Writers such as Flaubert, Chateaubriand, Théophile Gautier, and Pierre Loti all visited the Near and Middle East and incorporated "Oriental" themes and elements in their writings. With the advent of photography in 1839, the latter part of the 19th century saw increased demands for albums and images of the "alluring" Orient.

Improved means of transport and organized tourism also caused an increase in the market for photographic images of the Orient. The advent of steamships made it possible for the middle classes to travel to distant shores. In 1841 Thomas Cook began his organized tours. A full Mediterranean tour took passengers to the

Egyptian pyramids, the Biblical sights of the Holy Land, the classical antiquities of the Aegean and to Istanbul. The Hamburg-American Packet (Hapag) Company merged with North German Lloyd in 1857 to become Hapag Lloyd, launching its own grand tours to the East. The Orient Express began in 1883 and by 1889 had extended its retail service to Istanbul. New travel guidebooks were produced for the increased tourism, and international trade exhibitions of the 19th century also focused attention on the Orient. The opening of the Suez Canal in 1869 brought further improved conditions for travel and allowed photographers easy access to Oriental lands.

Among the first to travel to North Africa, shortly after the invention of the Daguerreotype in 1839, the painter Horace Vernet went to Egypt and the Holy Land to photograph, accompanied by the daguerreotypist Fréderic Goupil-Fesquet. Daguerre had predicted that the intensity of Egyptian light would help produce an image more quickly. The first daguerreotype taken in Egypt by Fosquet in October 1839, was titled "The Harem of Mohammed-Ali in Alexandria." (It actually only showed a half-open door and two guards.) The subjects of "Woman" and "Other" were to become a popular, as elements of the exotic, sexual, and decadent, were incorporated into many photographs.

Photography became a significant travel aid for artistic, archeological and geographic expeditions. In 1849–51, Maxime Du Camp accompanied Flaubert on his trip to Egypt and published some of his images in 1852 in an important album, *Egypte, Nubia, Palestine, et Syrie*. Several of the painter Jean-Léon Gérome's expeditions to the East included a photographer—his brother-in-law Albert Goupil in 1868, and Auguste Bartholdi in 1855. Bartholdi, perhaps better known as a sculptor, recorded both monuments, such as his "Colossi of Memnon" 1855, as well as aspects of their day to day travels.

The largest group of travelling photographers came from France, the second largest from England. Other European countries such as Italy, Germany and Austria and the United States had relatively few photographers travelling to the area in the early days of photography. There were few "local" photographers, in part due to religious restrictions, forbidding the making of "graven images." The first local photographers thus to open up shops were primarily Christians.

The relative prosperity in France and England during the middle of the 19th century allowed for more frequent travel to the Orient. The French government, in particular, encouraged Orientalist studies and often financed exploration trips. Maxime Du Camp and Auguste Salzmann were among the first to receive such support, followed by Louis de Clerq, Louis Vignes, and Théodule Dévéria. Government survey missions from England were fewer than from France but the British tended to spend years rather than months surveying and photographing. Significant were the military expeditions of the Royal Engineers, in particular, the Ordnance Survey of Jerusalem (1864–65) and the Ordnance Survey of Sinai (1868–69) with James MacDonald as official photographer. The Palestine Exploration fund was established in 1865 and an American Palestine Exploration Society was founded in 1870. The first American expedition under Dr. Selah Merrill arrived in Lebanon in 1875. Tancrede Dumas of Beirut was the official photographer for that mission.

Religious mission groups also often had photographers. As example, James Graham, lay secretary of the London Jews Society, came to Palestine for four years and was an active photographer there. In general, according to Nissan Perez, in *Focus East*, British photographs tended to be more objective while the French images tended to contain more mystery and emotion. "If the British in their truthful images denuded the Orient from its silken veil of Arabian Nights fantasy, the French wrapped it even more and made it more mysterious, more sensual—a project of pure Western fantasy and imagination. With an eye for detail and daring composition, French photographers [such as Teynard] reflected in their images the spirit of the places rather than the stark reality..." (Nissan Perez, *Focus East: Early Photography in the Near East (1839–1885)*, New York, Harry Abrams, 1988, p. 83)

Technical advancements in photography also had an effect on the type of photographic images produced. Initially the French daguerreotype and the British process, the calotype or talbotype, were employed. The latter system often produced quite atmospheric prints. These processes were overtaken by the wet collodion process that enabled Francis Frith to produce his beautiful large 16 × 20 inch negatives beginning with his first trip to Egypt in 1856. This process allowed for much faster exposures, often four to five seconds versus the calotype exposures which could be two minutes or the daguerreotype which could take as long as twenty minutes. The wet process gave way to the dry collodion process by 1875. Plates could then be prepared in advance and developed when appropriate. The development of gelatino-bromide emulsions in 1871, that were factory produced and exported from factories in Britain, France, and Germany to places such as Port Said in Egypt in the 1870s, was also significant. Innovations in lens design such as the 1886 Rapid Rectilinear lens further reduced exposure times and distortion in the image. These technical advancements made it possible for commercial photographers to better market their images and for photographers to set up photographic studios. In Port Said, the commercial market was initially dominated by Hippolyte Arnoux who had a floating darkroom on

Fenton, Roger. Reclining Odalisque.
The Metropolitan Museum of Art, The Rubel Collection, Purchase, Lila Acheson Wallace, Anonymous, Joyce and Robert Menschel, Jennifer and Joseph Duke, and Ann Tenenbaum and Thomas H. Lee Gifts, 1997 (1997.382.34) Image.

the Suez Canal, and the Zangaki Brothers who had a horse drawn mobile darkroom that actually appeared in a number of their images. Arnoux photographed the building site of the Suez Canal, and was known for his various studio portraits. Images such as his albumen prints "Odalisque, Egypt" c. 1880, and "Portrait of a Women," c. 1880, both using the same model against an alluring painted backdrop, are archetypal images of the exotic, seductive woman, that some studios fostered through the staging of such images.

The British Francis Frith was probably the first "entrepreneur" photographer to establish himself as the producer and promoter of large scale scenic and architectural photographs of the distant Eastern lands. Frith traveled to the Middle East three times between 1857 and 1860 and became the owner of the successful photographic-view company, F. Frith and Co., the largest such company in England. Frith's exquisitely detailed photographs record a world, often far off the beaten tourist track—that was in subsequent years to become vastly changed by the effects of archaeology, tourism and the politics of conflicting nations. One sees, for example, "Frith's Boat on the Nile," as its triangular sails pierce the quiet Nile and its silent sculptural, rocky shores; or "Cairo: The Mosque of the Caliph El-Hakim" where Frith shows the viewer the ancient mosque (990–1003), in ruins by the 1450s. Frith's framing of the majestic tower in a central arch form brings majesty and dignity to the monumental structure. In the foreground Frith has kept several people to show scale and local color. During much of his travelling, Frith dressed in "native dress"; a well-known self-portrait shows him in Turkish costume. Back home in England, the Victorians were enamored with foreign "costumes" that were picturesque and belonged to the middle and upper classes of any given country. Frith's book production in 8¾ × 6½ inch formats, contained beautiful albumen prints. From 1858–1862 his titles included, *Egypt and Palestine Photographed and Described by Francis Frith*; *Cairo, Sinai, Jerusalem*, and the *Pyramids of Egypt: A Series of Sixty Photographic Views by Francis Frith*; *Egypt, Nubia, and Ethiopia: Illustrated by One Hundred Stereoscopic Photographs;* and *Egypt, Sinai and Palestine, Supplementary Volume* (4 volume series).

While Frith's photographs were usually based on actuality, the Oriental photographs of Roger Fenton, comprising a suite of approximately 50 works, were studio based, from his London Albert Terrace studio. Fenton had traveled to the Crimea in 1855 on commission from the publisher, Thomas Agnew, and support from Queen Victoria to photograph the Crimean War effort. In so doing, Fenton provided one of the first extensive photo documentations of any war, and so collected many objects and fabrics that he was to use in his Oriental studio studies in the late 1850's. These images were not authentic, but were widely accepted by a public that sought the exotic and sensual, that was "safe" to view through the distance provided by the photographic image. In his 1858 "Pasha and Bayadère" one finds the elaborate details of patterned draperies, rugs, tables, and vases, and dress in a well articulated triangular composition of the three main characters on Fenton's stage set. Upon careful viewing, one can see there are actually strings holding the young woman's

hands, rhythmically placed above her head for the long exposure.

Other significant studios, established in the Middle East, included the Maison Bonfils, Abdullah Freres, Sébah and Joaillier, and Lehnert and Landrock. Félix Bonfils studied photography initially with Nièpce de Saint Victor. With his wife Lydia, who took studio portraits while he photographed throughout the Middle East, Bonfils established a successful business in Beirut, beginning in 1867, the first French photographer to relocate to the region. In 1871 he submitted prints of Egypt, Palestine, Syria, and Greece to the French Photographic Society and received its medal. His son, Adrian, who had mastered Arabic, took over the Maison Bonfils in 1885 when his father died. While many of the studio's images are posed, the photographs nonetheless are both documentary and artistic representations of 19th century Oriental cultures and monuments, that are important to consider in studying this era and region.

The Abdullah Freres were three brothers of Armenian origin who were particularly noted for their photographic work in Istanbul, often photographing royal guests in Istanbul. They also served as official photographers to Sultan Abdul Aziz in 1863, and later to Sultan Abdul Hamid II. For a brief period from 1886–1888, Kevork and Housep Abdullah established themselves in Cairo. The brothers sold their studio to Sébah and Joaillier in 1899.

Pascal Sébah initially worked in collaboration with Henri Béchard. Sébah received medals at International Exhibitions in Paris, Vienna and Philadelphia. With such success he opened a second studio in Cairo in 1873. In 1884 Policarp Joaillier became his partner in Istanbul. Noteworthy in Sébah's career was his collaboration with the Turkish painter Osman Hamdi Bey, whom he met in 1873. Sébah took photographs of models according to Bey's specifications for Bey's paintings and also experimented with light and shade. In his paintings, Bey often reacted to the cliché of the Oriental woman as sex object. Sébah also photographed models in traditional Turkish dress for an important album and Ottoman exhibition in Vienna in 1873.

Rudolph Lehnert, born in Bohemia (part of the Austrian-Hungarian Empire) in 1878, made his first trip to Tunis in 1903 and fell in love with the country. In 1904 he opened a studio with his friend, Ernst Landrock from Saxony. The two were captivated not only by the exotic beauty of people and places of North Africa, but also wished to capture a purity they felt was rapidly disappearing. From 1904–1930 the two worked closely. Their photographs of the Ouled Nail tribe in and around the Bou Saada oasis are particularly striking. During World War I their studio was confiscated by the British. In 1920 they founded a new company, Orient Kunst Verlag, and in 1924 they restarted their commercial enterprise in Cairo. By 1930, Lehnert returned to Tunisia where he died in 1948. The business they founded still continues in Cairo today, selling postcards and reproductions at 44 rue sherif Pasha.

In response to some Orientalist representations of Middle Eastern life by Western photographers that were perceived to be more fiction than fact, the Ottoman Sultan Abdul Hamid II, at the occasion of the 1893 World's Colombian Exposition, presented fifty-one photography albums to the National Library of the United States (now in the Library of Congress). The ornate albums containing 1,819 photographs by various Istanbul photographers emphasized reform and modernization. One sees for example, images of the elaborate Dolmabahçe Palace, constructed in 1856 that contains Eastern and Western architectural elements, or photographs of factories, docks, libraries, or a group of girls in a girls school, in simple uniforms, their heads uncovered.

By the 1890s the larger prints of some of the above photographers or photographers such as Francis Bedford, Robert Murray or Antonio Beato, had begun to become less popular. Such was in part due to the development of the PZ print, produced by Photoglob, Zurich. The process referred to as photochromy produced delicate, fairly accurate colored images. Not color photography, the process involved the use of collotype photolithography with a solution of asphaltum of ether, and involved as many as sixteen printings of different colors. This color process was applied to postcards, which became most popular when new postal regulations in 1894 allowed pictures to be mailed on postcards. And by 1900 the invention of the box camera brought competition to the staged Orientalist image, both large and small, as the family snapshot gained increase popularity.

Yet the impact of Orientalist photography still continues as the complexities of fact and fiction, dream and reality, continue to be studied. As Amelia Edwards wrote in 1892, "It may be said of some very old places as of some old books, that they are destined to be forever new…Time augments rather than diminishes their everlasting novelty…" (Amelia Edwards, *Pharaohs, Fellahs and Explorers*, New York, Harper and Brothers, 1892, 3).

KATHERINE HOFFMAN

See also: France; Daguerreotype; and Calotype and Talbotype.

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OTTEWILL, THOMAS & CO.

The Ottewill company has long been recognised as one of the best quality manufacturers of cameras and photographic equipment of the 1850s and 1860s. The Ottewill double folding camera is reputed to have been the inspiration for Lewis Carroll's poem *Hiawatha's Photographing* (1857). Carroll's camera was made by Ottewill and supplied to Carroll by the London firm of R. W. Thomas of Pall Mall.

The business of Thomas Ottewill was established in 1851 and as such can be considered as one of the earliest British specialist photographic manufacturers. The business was listed first at 24 Charlotte Terrace, Copenhagen Street in Barnsbury, London, subsequently expanding to numbers 23 and 24 for the remainder of the firm's existence. The *London Post Office Directory* first records the firm from 1854 as Daguerreotype Apparatus Manufacturers, a listing which was expanded to Photographic Apparatus Manufacturers from 1856, until the firm's disappearance circa 1866.

The firm was listed as Ottewill & Morgan in 1855 before adopting the title Thomas Ottewill & Co from 1856–63. The following year it became Ottewill, Collis & Co until it was last recorded in the directories in 1866, although from other sources the firm seems to have remained active until 1868. The firm claimed in 1856 (*Photographic Notes*, 1 November 1856, np) to 'have erected extensive workshops adjoining their former shops, and having now the largest manufactory in England for the make of Cameras, they are enabled to execute with dispatch any orders they may be favoured with.' The firm exhibited 'a Monster camera made by Mr Ottewill upon Capt. Fowkes' plan' at the Photographic Society's 1858 exhibition.

An 1865 advertisement (*Yearbook of Photography* 1865, adv) stated that the firm was photographic apparatus manufacturer to the governments of 'England, India, Italy, Switzerland, the Colonies, etc' and that a fresh infusion of capital, together with a general knowledge of the photographic art would allow it to supply every article connected therewith of first quality'.

The firm advertised regularly throughout its existence in the *British Journal Photographic Almanac* and *Yearbook of Photography,* the *Journal of the Photographic Society and Photographic Notes*. The firm's reputation was exhanced by the double folding sliding camera that it started making from the early 1850s. The design was registered formally on 25 May 1853 and attracted much favourable comment in the photographic press. The *Journal of the Photographic Society* (December 21 1853, 149) stated of the design that 'there is none which more fully combines the requisite strength and firmness with a high degree of portability and efficiency.' The design remained available into the 1860s. Other cameras advertised by the firm were equally innovative. Ottewill produced Captain Francis Fowkes's camera (British provisional patent number 1295 of 31 May 1856) in teak for the British government and an Improved Kinnear-pattern camera in 1859 that he claimed was the first to introduce a swing back. They also produced Frederick Scott Archer's folding camera which has been registered in 1854. As with other manufacturers Ottewill produced boxform cameras in single lens and stereoscopic versions as well as studio and portrait cameras from the early 1860s. The firm claimed to have been the first to introduce the swing back in 1859. In 1860 the firm produced a miniature camera clearly inspired by Thomas Skaife's Pistolgraph of 1859 made from mahogany which was mounted on a box that contain all the parts.

Lewis Carroll recorded in his diary for 18 March 1856 that 'we [Reginald Southey who taught him to take photographs] went to a maker of the name of Ottewill… the camera with lens etc will come to just about £15.' The camera was delivered on 1st May. Carroll's £15 did not include the chemicals and associated processing equipment which probably came separately from R W Thomas of London.

The Ottewill firm supplied and advertised cameras and photographic equipment under it's own account. It also supplied several well-known London firms with cameras to be re-badged under their own name, including the firm of Ross who were primarily lens

manufacturers. In an 1867 advertisement Ottewill & Collis state '15 years manufacturers to Ross the Optician. Mr Collis having had upwards of 13 years experience in Mr Ross's establishment.' Ottewill also employed Patrick Meagher who went on to successfully establish his own firm in 1860.

Most of Ottewill's cameras can be criticised for their lack of innovation, but there is no faulting the very high quality of craftsmanship with which their cameras were made and a contribution to British camera making which, in the words of the *British Journal Photographic Almanac* of 1898 (p 640) 'may be regarded as the source to which the best school of English camera-making traces its origin'.

MICHAEL PRITCHARD

See also: Archer, Frederick Scott; Fowke, Francis; Dodgson, Charles Lutwidge (Carroll, Lewis); and *British Journal Photographic Almanac (1859-).*

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OTTOMAN EMPIRE: ASIA AND PERSIA (TURKEY, THE LEVANT, ARABIA, IRAQ, IRAN)

The discovery of photography was publicly announced in the Ottoman Empire on 28 October 1839, the news appearing in the government newspaper *Takvim-i Vekayi*, published in Istanbul in Turkish, Arabic, French, Greek and Armenian.

The spread of photography in the lands of the empire was pioneered by numerous travelers, writers, archaeologists, artists and architects (Özendes, 1995, 26).

On 21 October 1839 the French painter Horace Vernet (1789–1863) and the daguerreotypist Goupil Fesquet (1817–1878) sailed from Marseille to photograph the sights of the East. They arrived in Syria on 30 October and in Alexandria in November. In Egypt they found that Pierre Gustave Joly de Lotbiniere (1798–1865) had preceded them and was photographing on the banks of the Nile. From Egypt they traveled by caravan via Sinai to Syria, visiting Palestine, Tyre, Saida, Deir El Kamar, Damascus, Jerusalem, Nazareth, Beirut and Baalbeck, before travelling to İzmir on the Aegean Sea, arriving on 8 February (Özendes, 1995, 85).

Joseph Philbert Girault de Prangey (1804–1892), a student of Islamic architecture, visited the Middle East between 1842–1845 taking Daguerreotypes of Islamic buildings and monuments. These pictures were published in *Monuments Arabes d 'Egypte de Syrie, et d 'Asie—Mineure dessinés et mesurés de 1842 à 1845* in Paris in 1846 (Özendes, 1995, 96).

Excursions daguérriennes: Vues et monuments les plus remarquebles du globe 1840–1844 published in Paris by Nicolas Paymal Lerebours contains 114 photographs taken by Fesquet, Lotbiniere and Prangey (Özendes, 1995, 96).

The French writer Maxime du Camp (1822–1894) arrived in İzmir in May 1843, and after visiting Ephesus and other sites in the region traveled to Istanbul, and from there to Greece, Italy and Algeria. Du Camp's illustrated account of this journey entitled *Souvenirs et Paysages d 'Orient: Smyrne, Ephése, Magnésie, Constantinople, Scio* was published in Paris in 1848 (Özendes, 1995, 98).

Ernest Edouard de Caranza, a French physics and chemical engineer who worked in Imperial Gunpowder Factory (Baruthane-i Amire) since 1839, took many Calotypes in Istanbul between 1852–1854 and presented an album to the Ottoman palace. During this period he was given the title of royal photographer (Özendes, 1995, 107).

Alfred Nicolas Normand (1822–1909), who visited Istanbul in 1852, took Calotypes in which composition took precedence over technique (Özendes, 1995, 108).

A photograph of Péra taken by the Irish aristocrat John Shaw Smith (1811–1873) in 1852 is the earliest known combination of two negatives (Özendes, 1995, 108).

Jacob August Lorent (1813–1884) traveled to North Africa in 1858 and documented Arab culture, publishing his photographs in *Egypten, Alhambra, Tlemsen, Algier: Photographische Skizzen* in Mannheim in 1861 (Özendes, 1995, 148).

Francis Frith (1822–1898) arrived in Egypt in September 1856, and the photographs he took were exhibited in England in 1857. The same year he traveled to the Middle East and traveled through Palestine and Syria until May 1858. His photographs of both journeys were published in *Egypt and Palestine Photographed and Described*. In late summer 1859 Frith returned to Egypt and from there traveled to Sina, Petra, Palestine, Syria, Damascus, Jerusalem, Beirut and Jaffa, photographing İzmir in 1860. The same year he established Frith and Co., which became Europe's largest producer of photographs. His own portrait in Turkish costume is on the first page of his album entitled *Egypt, Sinai and Palestine*, which is illustrated by 37 photographs (Özendes, 1995, 149).

The British landscape photographer Francis Bedford (1816–1894) accompanied Edward Prince of Wales on his journey to Turkey and the Middle East in 1862, and in 1863 his photographs appeared in *Tour in the East; Photographic Pictures of Egypt, The Holy Land and*

Pesce, Luigi. In the Mosque of the Damegan/The Eunuchs. *The Metropolitan Museum of Art, Gift of Charles Wilkinson, 1997 (1997.683.21) Image © The Metropolitan Museum of Art.*

Syria, Constantinople, The Mediterranean, Athens, etc published in London by Day & Son (Özendes, 1995, 154).

In 1862 A. de Moustier traveled through Anatolia taking photographs, which were used to illustrate the 15 volume *Le Tour du Monde* published in 1864 (Özendes, 1995, 156).

Tancrede R. Dumas, who founded a studio in Beirut in 1860, took photographs in Istanbul in 1866 (Özendes, 1995, 162).

L. Fiorillo of Alexandria and G. Lekegian of Jerusalem are noted particularly for photographs of their own localities (Özendes, 1995, 82).

Travelers to this region mainly took photographs of eastern cities, so different from their western counterparts, ancient ruins, the pyramids of Egypt and Muslim cemeteries (Özendes, 1995, 44)

James Robertson (1813–1888), who worked as an engraver at the mint in London between 1833–1840, was employed in Istanbul from 1841, after the Ottoman government decided to modernize the Imperial Mint. He and Felice Beato (1825–1903) photographed Malta in 1850, and Greece, the Balkans and Anatolia in 1851. In 1853 Robertson's photographs were published as *Photographic Views of Constantinople* by Joseph Cundall in London, followed the next year by *Photographic Views of Antiques of Athens, Corinth, Aegina etc,* again by the same publisher.

After the Crimean War broke out between the Ottomans and Russians in 1853, first France and then, in March 1854, Britain, joined the war as allies of Ottoman Turkey. Roger Fenton was commissioned to photograph the war, and with his horse-drawn cart inscribed with the words "Photographic Van" he took over 360 photographs in 1855. When Fenton became ill and returned to England, Robertson and Felice Beato went to the Crimea in August 1855, and took over sixty photographs of Sivastopol, Malakoff and Balaklava during the last months of the war.

Beato traveled to India in 1857, China in 1860 and Japan in 1862. Robertson closed his studio in Istanbul in 1867, but evidently remained there fore another decade, since the last medallion that he designed for the Ottoman Mint is dated 1876. In 1881 he went to Japan, where he died in 1888 (Özendes, 1995, 89).

Carlo Naya (1816–1882) opened a studio in Péra, Istanbul, in 1845. Upon the death of his brother Giovanni in 1857, he returned to Italy and settled in Venice (Özendes, 1995, 100).

As western travelers became more familiar with the Islamic countries, they began to photograph local people as well as monuments, streets and markets, and this led to the emergence of local studios in the major cities of the Ottoman Empire (Özendes, 1995, 44).

In Istanbul studios began to be established from the 1850s, mainly along Grand' Rue de Péra, in the district where westerners working in the city congregated (Özendes, 1995, 35).

The first Ottoman studios were established by Armenians and Greeks, since although there was a portrait tradition in court circles, Islamic orthodoxy frowned on representation of the human figure and Muslims were reluctant to be photographed. Armenians were skilled artists and artisans, famed particularly as pharmacists,

chemists and goldsmiths. So Armenians with the knowledge of chemistry required for the Daguerrotype process, and who moreover studied this subject at the Murad-Raphaelyan School in Venice were among the first Ottoman photographers (Özendes, 1995, 21).

The Ottoman Greek photographer Basile (Vasili) Kargopoulo (1826–1886), who opened his studio on Grand' Rue de Péra in 1850, created a valuable documentary record of the time with his photographs of Istanbul and daily life in the city. He was awarded the title of royal photographer by Sultan Abdulmecid (r. 1839–1861), a position he held for many years, and was also private photographer to Sultan Murad V (1840–1904 r. 1876) (Öztuncay, 2000).

Fascination with the Orient began with the Turqueries fashion in the 16th century, when diplomats and travelers had their portraits painted wearing Turkish costume. In the 18th century the Istanbul embassies of principal European countries employed artists to do paintings and drawings of Turkey, Middle East and Egypt to satisfy the curiosity of friends and colleagues back home. In the 19th century the floodgates of Orientalism opened.

Although photography was supposedly the opportunity to see the 'real' Orient rather than artists' interpretations, photographers created scenes that perpetuated the preconceived European image of the Orient.

Westerners were fascinated above all by eastern women, and in response to this demand photographers generated a new category of photographs with titles like 'A Turkish Woman' or 'Young Turkish Girl' In fact it was out of the question that any Muslim woman would have sat for such photographs, and the women portrayed were generally foreigners or local prostitutes. When photographers had trouble finding models they even resorted to dressing up men in women's clothing. Although their faces are veiled, close scrutiny of eyes, hands and thick ankles reveals the deception (Özendes, 1999, 9, 160).

Pascal Sébah, (1823–1886), who opened his photographic studio, *El Chark,* on Postacılar Street in Péra in 1857. In 1873, he opened a branch studio in Cairo, and exchanged some negatives with H. Bechard, who had been working in Cairo since 1870. Each set their own signatures to the other's negatives.

After Pascal Sébah's death his studio remained in business, and in 1888 when Policarpe Joaillier became a partner, the name El Chark was changed to Sébah & Joaillier. This firm became the foremost representative of Orientalism in photography.

When Kaiser Wilhelm II (1859–1941) visited Istanbul in 1889, he was photographed by Sébah & Joaillier, and the firm was awarded the title of photographers by appointment to the Prussian court (Özendes, 1999).

Vichen Abdullah (1820–1902) began his photographic career touching up photographs for Rabach, who had opened his Istanbul studio in 1856. In 1858, when his younger brother Kevork (1839–1918) returned from studying at the Murad-Raphaelyan School in Venice, they and another brother Hovsep (1830–1908) took over Rabach's studio. The new firm became known as Abdullah Fréres.

In 1863 a portrait of Sultan Abdulaziz (r. 1839–1876) taken by Abdullah Frères earned them the title of royal photographer.

In 1886 at the request of Khedive of Egypt Tevfik Pasha, the Abdullah brothers opened a branch in Cairo.

They closed down the branch in Cairo in 1895, and at the end of 1900 sold their studio to Sébah & Joaillier (Özendes, 1998)

Nikolai Andreomenos (1850–1929) took a job touching up photographs at the Abdullah brothers' first studio in 1861 and took this over in 1867. He then opened a branch in Péra and became one of the photographers who won entry to the palace, giving lessons in photography to crown prince Vahdettin, later Sultan Vahdettin (1861–1926 r. 1918–1921) (Özendes, 1995, 164).

In the early 1870s Guillaume Berggren (1835–1920) opened a studio on Grand' Rue de Péra and took what are considered to be the loveliest contemporary images of Istanbul. He was decorated by the Swedish king Gustaf V (1858–1950) during his visit to Istanbul in 1885. When Berggren died his niece had all his photographic equipment buried with him in the Swedish cemetery in Istanbul (Wigh, 1984).

Felix Bonfils (1831–1885) opened a studio in Beirut in 1867. His son Adrien (1861–1929) joined the studio in 1878, and continued to work as a photographer for a decade after his father's death in 1885 (Özendes, 1995, 174).

Bogos Tarkulyan (?–1940) acquired his photographic training as assistant to the Abdullah brothers. In 1890 he opened his own studio, which he named Phébus, and became known as 'Phébus Efendi' (Mr. Phébus). Tarkulyan was also a skilled artist, and became the first Ottoman photographer to color photographs (Özendes, 1995, 175).

Ottoman studio owners prepared graphic designs incorporating the decorations they had received from the Ottoman sultans and European rulers, and medals they had won, and these were sent to the Bernhard Wachtl firm in Vienna to be printed on the back of mounts for Carte-de Visite and Cabinet sized photographs (Özendes, 1995, 65).

Photography came to be very widely used during the reign of Sultan Abdulhamid II, who used it as a way of keeping up with events around the empire without leaving his palace. By appointing photographers to record events and institutions all over the country, Sultan Abdulhamid became the principal patron of photography in Ottoman Turkey. When it was decided to pardon a

large number of prisoners to commemorate the 25th anniversary of his accession to the throne, he had photographs taken of the inmates in prisons throughout the country.

In 1893 the sultan sent photograph albums to the president of the United States and the monarchs of Britain and France to promote the country's image (Özendes, 1995, 28).

In the nineteenth century photography was added to the curriculum of the Imperial School of Military Engineering. Graduates in art from this school who had become photographers were employed to teach the new subject. Among them were Ali Rıza Bey (?–1907), Ali Sami Aközer (1866–1936), Captain Hüsnü Bey (1844–1896) and Ahmed Emin (1845–1892).

Ali Sami Bey, one of the military photographers appointed by Sultan Abdulhamid II, took photographs documenting the 1898 state visit of Kaiser Wilhelm II, who from Istanbul traveled to Jerusalem. Ali Sami Bey presented an album of these photographs to the sultan. Garabet Krikorian of Jerusalem also took photographs of the kaiser's journey (Özendes, 1989).

Adjutant Major Mehmet Hüsnü (1861–?), Bahriyeli Ali Sami and Fahrettin Türkkan Pasha (1868–1948) were among the photographers graduated from other military schools who were employed by the palace (Özendes, 1989).

Baghdad's most eminent photographer Z. G. Donatossian took photographs of every official inauguration, while Sadık Bey's photographs of Mecca were the first of the holy city ever to be taken (Özendes, 1995).

In Persia the first Daguerreotype was a portrait of 13 year old Prince Nasar-od-din Mirza taken during the reign of Muhammed Shah Qajar (r. 1834–1848) by the Russian diplomat Nikolaj Pavlov in 1842.

A photographic laboratory established in the royal palace by Muhammed Shah reflects the growing interest in photography, which had been introduced by western visitors to Persia. This laboratory could be described as the first official studio (Tahmasbpoor, 2004).

ENGIN ÖZENDES

See also: Kargopoulo, Basile (Vasili); Berggren, Guillaume (Wilhelm); and Abdullah Frères (Abdullahian Brothers), Whichen, Kevork and Hovsep.

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OTTOMAN EMPIRE: EUROPEAN (BULGARIA, SERBIA, MACEDONIA, ALBANIA, AND BOSNIA)

Albania

Three generations of photographers from the Marubbi family represent the core of the history of photography in Albania. The first, Pjetër Marubbi (1834–1903) or Pietro Marubbi, an architect, painter, sculptor and photographer, was born in Piacenza, Italy, and as a member of Garibaldi's movement, came to Albania where he in 1864 founded the first studio for photography in the town Shkodra. The Studio Marubbi, as it was printed on the reverses of his cartes-de-visite, which worked until 1890, was specialized both for portrait-making and for photographic documentation of the famous marketplace (bazaar) in Shkodra. With remarkable success and greatest attention he documented city-scenes, as well as the scenes of fishermen's lives. When shooting landscapes, he chose the panoramic aspect, whilst in documenting the scenes of old urban settlements he sometimes boldly shortened the perspective. Some carte-de-visite portraits by Pietro Marubbi look like salt prints, but they are made on albumen paper. Many are hand-colored and varnished. Marubbi published some of his photographs on life and customs in Albania in the magazine "Illustracione Italiana." Later on, in the 20th century, his photographs were often used as illustrations in many books about Albania. They were motives on the first postcards and many other reproductions.

The second generation of Marubbi photographers is represented by brothers Mati and Kel Kodheli, Pjetër Marubbi's adopted sons. It was Kel who took over the Studio, because Mati died young (1862–1881). Kel Marubbi (1870–1940) documented, as a good reporter, all the important events and persons involved in the movement for liberation of Albania from the Ottoman Empire. Especially important are his reports about the mountainous regions where he took photographs of anonymous peasants and shepherds as well as interesting folklore types. Around 1900, the Studio Marubbi was, according to the print reverses on the photographs, the official photographer for the Montenegrin royal family Petrović in Cetinje.

Kel's son, Gegë Marubbi (1907) who had continued his father's work, gave the entire collection of negatives from the Studio Marubbi, with a span of almost hundred years (1864–1952), to the Albanian Country. In 2005, UNESCO and its Italian-founded PASARP program started the process of digitizing about 240,000 negatives, glasses and films of this collection.

Kolë Idromeno (1860–1939), one of the leading painters of realism, had also a studio for photography in Shkodra. He printed numerous postcards, notably in Austria and Germany at the turn of the century.

Bosnia and Herzegovina

According to the latest research, the oldest existing photograph was taken in Sarajevo in 1855, and its author was Georg Knežević. It is a photograph of a bride and bridegroom (Jaša and Gavrilo Jelić), who were both from families of tradesmen, and were thus members of the middle class in a society that was still feudal. Georg Knežević was a traveling photographer, who worked first in Budapest, then Novi Sad, Segedin, Belgrade, Sarajevo and finally in Zadar. He combined the form of carte-de-visite with paper negatives printed on salted paper when making portraits in his improvised atelier, but in his senior works he used wet plates and albumen paper. He regularly visited Sarajevo for longer periods of time, of which a number of private collections of photographs give evidence. Although he was a traveling photographer, Knežević wrote his name, surname, profession and location both on the back and on the front of his photographs in Cyrillic letters.

During the insurrections in Herzegovina in 1875–1878, came a traveling photographer named Silvio S. Maskarić from Dubrovnik. He made many portraits of the insurgents, as well as of the refugees who found shelter in Dubrovnik's surroundings. Beside wet plates, he also used the ambrotype technique.

With the arrival of the Austro-Hungarian army in 1878, many traveling and official photographers came to the area. Traveling with the army, their photographs were often of executions and other military subjects but they usually lack the signature of their authors.

The first permanent studio for photography was opened in Sarajevo by Anton Shadler who came from Vienna in 1878. Another photographer, František Franjo Topič came to Sarajevo as a representative of the Viennese Court Art Institute C. Angerer and Goshl. He was very active as an outdoor photographer until 1905 and he published many photographs in the official annual of Provincial Government "Bosnian" (Bošnjak).

The National Museum (Zemaljski muzej Bosne i Hercegovine) was founded in 1885 and from 1891 it published its illustrated "Annual" (Glasnik) with photographs of Ćiro Truhelka, the director of the Museum and of A. Weinwurm, photographer. In the book "Durch Bosnien und die Herzegowina kreuz und quer" (Through Bosnia and Herzegovina along and across), Berlin 1897, an eminent number of Weinwurm's photos was included.

At the end of the 19th century, there were many photographers in Bosnia and Herzegovina from all the countries within the Austro-Hungarian Monarchy: G. E. Abinum, Emanuel Buchwald, Ignaz Lederer, A. Viditz, Stefan Ossko and A. Hoiger working in Sarajevo, Ottmar Rebaglio and Johan Patzelt in Banja Luka, Anton Kuzcento in Livno, Julius Zenter in Brčko, Vladimir Merćep in Bileća and Cisar Leopold in Bosanska Krupa.

The first amateur photographer and mountaineering reporter was doctor Radivoje Simonović from Sombor, who climbed Herzegovina's mountains in 1888, and some of his photographs were published in the magazine "Nova Iskra" (New Spark) from Belgrade.

Bulgaria

The first photographers in Bulgaria were foreign traveling photographers that came in the middle of the 19th century. They were mostly French, Austrian, Hungarian and German. The oldest existing photograph was made by a traveling photographer in 1851 in the town Šumen, and it represents an orchestra founded by Mihail Šafran, an immigrant from Hungary and participant of the revolution of 1851.

Before he founded the most prominent studio for photography in Sofia in 1878, Anastas Karastojanov (1822–1880) was the court photographer of the Crown-Prince Mihailo Obrenović in Belgrade under the name of Anastas N. Stojanović, as it was printed on the reverses of his cartes-de-visite from 1863. Being a participant of the Bulgarian national revival (Vazrazdane), he made dozens of portraits of the prominent insurgents. He also used the wet plates technique when he documented the spectacle organized in the streets of Belgrade on the occasion of the 50th anniversary of the Obrenović dynasty and of the uprisings for the liberation from Turkey. His sons Ivan and Dimitar had continued the work at the studio "Braća Karastojanovi" in Sofija, and it had been prosperous from 1878 until the middle of the 20th century.

Ivan Stojanov Papazov-Zografov, learned to paint icons at the Holy Mountain, first, and around the year 1860, he began making photographic portraits as well as icons in Panaguriste. Because of the fact that he participated in the April's insurrection, he and his wife received the capital punishment, and his studio for photography was destroyed. We can judge his work only by a remaining family album with photographs. Stojan Karaleev was also both a painter of icons and a

photographer. He learned to paint icons in Kiev where he also bought a photo-camera around 1870.

Nikifor Nenčev Minkov (1838–1928) gained his first knowledge of photography in Rumania, and around 1860, he founded a photographic studio in Istanbul under the name of "Nikifor Konstantinopol." During the Russian-Turkish war of 1876, he took panoramic overviews with military troops and scenes of life behind battlefield.

Toma Hitrov (1840–1906), together with Josif Buresh opened a photographic studio "Slavjanskata Svelopisnica" in Sofia around 1890. He made portraits, of which the best ones are those of the cabinet format, but he also photographed everyday life in the streets of Sofia. His portraits of contemporaries (insurgents, prominent writers, scientists and intellectuals) are very direct and sincere, and they show the author's keen sense for analyzing characters. He remained faithful to the wet plates technique until the end of the 19th century. He was one of the first photographers who systematically documented the landscapes and locations where the key events of the Bulgarian insurrection took place. At the beginning of the 20th century, his daughters Ivanka and Bojka took over the studio. They learned photography in Dresden and Berlin.

Many foreign photographers had their permanent studios in bigger Bulgarian towns, only after the liberation, that is to say, at the end of the 19th century. Some of which are the following: M. Wolf, Fr. Bauer, O. Markolesko, M. Rekhnitch, J. Buresh, V. Velebni, F. Grabner, M. Kurtz, etc.

The Collection "Portraits and Photos" kept in the National Library St. Cyril and Methodius in Sofia, consists of over 80.000 photo documents.

Macedonia

In the second half of the 19th century, came a number of traveling photographers from Serbia, Bulgaria, Turkey, Greece and Austria to the regions of today's Macedonia. Authors that are truly essential for the development of photography as well as for cinematography are beyond doubt brothers Yanaki and Milton Manaki.

The Manaki Brothers were born in a small village Avdela, Kostur area, Greece. They started to work together in 1898. During this time Yanaki (1878–1960) was a drawing professor in the high school in Yoanina, where he opened his photo studio with his younger brother Milton (1882–1964). In 1905 they moved their studio to Bitola and opened their well-known "Studio for art photography." In that period, Bitola was an important political, economic and cultural center for the Balkans. At the invitation of King Karol the First, they took part in the Big World Exhibition in Sinaia-Romania in 1906. They won a Gold medal for their photo collection and received the title of court photographers of His Majesty Karol the First.

Their unique skills and artistry attracted many outstanding Balkan personalities, including Prince Mehmed, later to become the sultan of Turkey, King Karol I of Rumania, as already mentioned, and many of the legendary insurgents of the Macedonian revolutionary units of the uprising against Ottoman's empire.

The photo-legacy of the Manaki Brothers with 18.513 negatives, of which 7.715 are glass plates, is kept at the Macedonian State Archive, Regional Dept, Bitola.

Serbia

The work of Anastas Jovanović (1817–1899) belongs to the pioneer age of the calotype process in the Balkans, with more than 800 paper negative and 500 paper positive pieces, kept in the City's Museum in Belgrade. In his *Autobiography*, he described in detail his first encounter with daguerreotype and calotype in Vienna where he was from 1838 as student at the Academy of St. Ana and later, as photographer and lithographer, until 1859. According to J. M. Eder, an Austrian historian of photography, Anastas Jovanović practiced calotype as a member of the group around Anton Martin, the author of the book *Repertorium der Photographie* (1846/8). As many of Jovanović's portrate calotypes are dated 1850, it can be asserted that they were part of the preparations for the publication of *Spomenici Serbski* (Serbian Memorials), a series of lithographs of intellectuals, writers and prominent personalities from the young Serbian state. The portrait genre stands out in Jovanović's photographic opus not only because it greatly outnumbers all other motifs, but also because of its exceptionally high artistic merit. His decision to use close-ups helped him span the distance between his Voigtlander camera and the model.

The legacy of Anastas Jovanović includes paper negatives of the streets and squares of old Vienna as well as the fortress of Petrovaradin on the Danube and the Library of Belgrade photographed by Petzval's portrait lens in 1850, so that parts at the corners of the paper remained unexposed. He photographs outdoor scenes as panoramic overview, but searching for dynamic light-and-dark relations. The body of Jovanović's calotype works contains some still-lifes, interiors and reportages about historic events, such as the withdrawal of the Turkish army from the Belgrade fortress in 1867. Photographs of the exteriors that Jovanović made later on indicate that he, with the process of wet plates, adopted the conventional style of photographic approach.

The public in Serbia could read about the invention of daguerreotypes in *Magazin za hudožestvo, knjižestvo i modu* (The Magazine for Art, Literature and Fashion) already in 1839. Another magazine, "Srbske narodne

novine" (Serbian Popular Newspaper) states that Dimitrije Novaković made the first daguerreotype of the city of Belgrade. Serbian press reports about another domestic author—Milija Marković, a clergyman, who learned the technique from a German traveling photographer Adolf Deitsch in 1850. Josif Kappilleri, traveling daguerreotyper, came to Belgrade in 1844, and Florian Gantenbein came from Switzerland to open a permanent studio in Belgrade in 1860.

The appearance and publishing of collections of photographs in the format and outfit of cartes-de-visite coincided with the incline of the first Serbian dynasty: Obrenović's. Early studios of cartes-de-visite portraits, as Richard Musil and Mirić, Panta Hristić, Anastas Stojanović, Đoka Kraljevački, Aleksa Mijović, Milan Jovanović and others, introduced the international language of Disderi's portrait into Serbian photography. Their work is no different from the work of foreign photographers such as Nicolaus Stockmann, Moric Klempfner and Lazar Lezter.

The value of documentary approach becomes particularly apparent during Serian-Turkish war 1876–1878. Ivan Gromann, a Russian photographer, made a series of photographs in the wet plates technique about the scenes of war as well as fragments of everyday life in the south of Serbia. His intention was to perceive and document reality in its totality.

MILANKA TODIĆ

See also: Cartes-de-Visite; and Wet Collodion Positive Processes.

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OVERSTONE, LORD (1796–1883)

English patron

Samuel Jones-Loyd, first, and only, Baron Overstone, was an influential banker, a collector of Italian, Dutch, and French old-master paintings, and a munificent patron of the arts. He was one of the organizers of and lenders to the Manchester Art Treasures exhibition of 1857. His place in nineteenth-century photographic history is due to his connection with Julia Margaret Cameron and her family, to whom he provided substantial long-term financial support, in large part because of the friendship he had formed at Eton College with her husband, Charles Hay Cameron.

It was Mrs. Cameron's habit to give albums of her work to members of her family and to famous men whom she admired, like Sir John Herschel and George Frederick Watts, both of whom sat to her. As a likely acknowledgement of the largesse that had underwritten her photographic endeavors, on August 5, 1865, Mrs. Cameron gave Lord Overstone an album containing 111 photographs that she had made in the previous eighteen months, beginning with some of her earliest images. She indexed them in three categories: "Portraits," "Madonna Groups," and "Fancy Subjects for Pictorial Effect." Inevitably, Overstone became one of her sitters, but not until 1870.

GORDON BALDWIN

OWEN, HUGH (1808–1897)

As a photographer, Hugh Owen is now chiefly remembered for his photographs of the objects exhibited at the Great Exhibition of 1851 (otherwise known as Exhibition of Works of Industry of All Nations) and for being the first photographer to photograph a cornfield (an achievement since early emulsion usually rendered

yellow as black). Little is known of Owen's early life except that he was born in 1808. He was an accountant and the Chief Cashier for the Great Western Railway, employed by Isambard Kingdom Brunel. Owen even lived for a while, in and apartment in the Temple Meads building, above the railway's offices. He was married twice—the first time at St. Mary's Redcliffe Church to the daughter of Thomas King a Master of the Society of Merchant Venturers—and it is known that he had at least one child (a daughter).

It is not clear how or when Owen first became interested in photography, but most accounts have him making photographs by 1847. In a letter to W.H.F. Talbot written in March of 1845, Owen requests a sample of Talbot's calotype process and says that he as "for some time practiced the process on Silver." This statement implies that he was familiar with the dagurreotype process before learning the rudiments of photography on paper. It has also been suggested that Owen once worked with another Bristolian photographer by the name of John Bevan Hazard in the 1850s, though further research needs to be done to determine the exact nature of their collaboration.

In 1851 Owen, along with the French photographer C.M. Ferrier, was "elected by his peers" to make 155 photographs for the Executive Committee of the Great Exhibition. The photographs were intended to illustrate the Reports by the Juries and the prints were to be made by Nicholas Henneman using Talbot's salted paper process. Concern over the quality of Henneman's printing though led the majority of the prints to be produced in France under the supervision of Robert Jefferson Bingham who had also taken several of the pictures. It was an ambitious project and the first known attempt to photograph the contents of an exhibition and thus represents an important watershed in the history of catalogue publishing. Surviving prints from this body of work show that in some instances Owen chose to photograph the object in isolation, as we can see for example in *Camel Gun*, where the gun and its elaborately decorated saddle are set against a dark background. There are no clues about how the gun was displayed, what other objects surrounded it, or how it would have appeared to the viewers who paraded through the Crystal Palace in 1851. The photographs seem to have been meant more as a kind of inventory rather than a souvenir of the exhibition itself. Approximately one hundred and forty bound sets of the reports were made and were distributed to Queen Victoria, the Exhibition Commissioners, the British Museum and "a few other institutions."

The city of Bristol was also commonly featured in Owen's photographs. One of his earliest photographs was of the shops of the Corn Exchange on Narrow Quay. Dating from the 17th century, the building was demolished in 1849 and was one of several examples of historic architecture in Bristol that Owen sought to record and preserve through photography. A number of these photographs were exhibited in London at the Society of Arts exhibition in 1852 and the Photographic Institution in 1853. These images reflect the almost documentary style with which he approached his subjects. Heavily influence by the Pictureseque tradition, he also photographed scenes from the countryside around Bristol including waterfalls, quarries and "ruins" as we can see in a work titled *The Bishop's Palace*. Probably photographed in the late 1840s or early 1850s only two decades after the Bristol riots of 1831 that had been the cause of the building's destruction. Given his position as an employee of the Great Western Railway, it is no surprise to find that Owen also photographed trains—and in particular one that had gone of the rails—as can be seen in the photograph titled *Bristol and Exeter Railway No. 20*. Several of his photographers were later copied and made into lantern slides and then were eventually turned into postcards featuring the city of Bristol and its environs.

Owen was also one of the founding members of the Calotype Club in 1847. The majority of his photographs are salted paper prints made from paper negatives (except for a few prints he made while trying out the wet-collodion process). Although he experimented with the wet- collodion process, his distaste for the medium (apparently he was irritated by the staining of his fingers by the collodion mixture) led him to abandon photography around 1855.

Photography was not Owen's only hobby. He was obviously very interested in the historic sites of Bristol and was made a Fellow of the Society of Antiquarians. In 1873 he published a book titled *Two Centuries of Ceramic Art in Bristol* and was considered an expert in the field.

Although somewhat a forgotten figure within the history of photography, Owen is considered to be the master of early photography in Bristol. His contributions to the history of early photography in England are only beginning to be re-discovered. His photographs were often left unsigned but occasionally bear the letters HO. Owen's work can be found in public collections around the world but the largest collection appears to be in the Bristol Records office. He died in 1897.

LORI PAULI

Exhibitions

1851 *Great Exhibition of the Works of Industry of All Nations*, Royal Commission, Crystal Palace, London

1852 *An Exhibition of Recent Specimens of Photography*, Society of Arts, London

1853 *Photographic Exhibition*, Aberdeen Mechanics Institute, Aberdeen, Scotland.
1853 *Exhibition of Photographic Pictures*, Photographic Institution, London.
1853–54 *Society of Arts*, 1st Tour, London.
1854 *Exhibition of Photographic Pictures in Dundee* Royal Infirmary Fund, Dundee, Scotland.
1854 *Exhibition of Photographs and Daguerretoypes*, Photographic Society, London.
1855 *Exhibition of Photographs and Daguerreotypes* (Second Year), Photographic Society, London.
1888 *Exhibition of the Royal Photographic Society of Great Britain*, London.

Collections

Bristol Records Office, Bristol.
Swansea Museum Library, Swansea.
Victorian and Albert Museum, London.
J.Paul Getty Museum, Los Angeles, California.
Harry Ransom Humanities Research Center, University of Texas, Austin, Texas.
Canadian Center of Architecture, Montreal, Quebec.
National Gallery of Canada, Ottawa, Ontario.

See also: Calotype and Talbotype; Dagurreotype; Edinburgh Calotype Club; and Wet Collodion Positive Processes.

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P

PACHECO, JOAQUIM INSLEY (c. 1830–1912)

Portuguese painter and photographer

Born in Cabeceiras de Basto, Portugal, in about 1830, landscape painter, watercolor artist and photographer Joaquim Insley Pacheco learned the daguerreotype method from Frederick Walter in Ceará, Brazil, before studying under Mathew B. Brady and Jeremiah Gurney in New York. He also used the ambrotype and platinotype methods and was "an apologist of photopainting." Pacheco in 1854 founded a photographic studio in Brazil originally called Pacheco & Son (later Insley Pacheco) and returned to the US to photograph the Civil War (1861–1865). Renowned for his portraits, he was a favorite of Emperor Pedro II. Appointed Imperial Photographer on December 22, 1855, and dubbed a Knight of the Royal Order of Christ, Pacheco won over 16 medals for works shown at the Imperial Academy and national and international exhibitions. He took part in the 1862 London Exhibition, the Expositions Universelles of 1867 and 1889 in Paris, the Vienna Universal Exhibition (1873), the Philadelphia Universal Exhibition (1876), the Buenos Aires Continental Exhibition (1882), and the Chicago Exhibition (1893) among others. His photographs won honorable mention in Vienna, first prize at the Oporto International Exhibition in Portugal (1865) and a gold medal at the Louisiana Purchase Exposition (1904). He died in Rio de Janeiro in 1912.

SABRINA GLEDHILL

PAINTERS AND PHOTOGRAPHY

Artists from the time of the Renaissance relied on optical devises such as the camera obscura as an aid to create landscapes, interior views, still-lifes and portraits. The way that a camera records a view differs from how our eyes see the same scene. The camera image perspective is perceived differently, and the images are in sharper focus. Painters using the camera obscura knew this, and used this forerunner of the camera to meticulously render objects, and to represent depth and dimension on the flat surface of canvas.

With the invention of the daguerreotype, the image captured by the camera was no longer fleeting. It now had the same permanence as a painting and could be framed, stored in a case and shared with others. Some artists and critics feared that photographs would eventually replace painted portraits and landscapes. Samuel F. B. Morse (1791–1872), who brought Daguerre's process to the United States in 1839, believed that "Art is to be wonderfully enriched by this discovery. How narrow and foolish the idea which some express that it will be the ruin of art." Morse was obviously correct, and during the second half of the nineteenth century, photography influenced artists both self taught and academically trained, in styles as diverse as Folk Art, Realism, and Impressionism.

Portrait Painting

The public began to look at paintings in new ways as a result of the photographic images that were available to them after 1839. Daguerreotypes provided likenesses that made the work of itinerant artists appear less true to life, and they were less expensive than painted portraits. The growing interest in daguerreotype portraits resulted in a reduced interest in miniature portraits in the 1840s and 1850s, and some painters of miniatures began to earn a living hand coloring daguerreotypes. Not every artist abandoned miniature painting. John Henry Brown (1818–1891) of Lancaster, Pennsylvania, did not even take up the art of miniature painting until the 1840s. He relied heavily on daguerreotypes as an aid in creating

his miniatures which he sold for between $100–$250 to wealthy patrons in Philadelphia. This was significantly more that the three to six dollars charged for painted daguerreotypes.

While some artists stopped painting portraits as a result of the competition of daguerreotypes, most artists painting life-sized portraits quickly found ways to use the new technology as a tool to assist them in the creation of their work. Photography was recognized as an aid to the making of portraits by both Itinerant portrait painters in New England capturing the likeness of local inhabitants, and the Academically trained artists in Europe painting portraits of world leaders. Painters such as Horace Bundy (1814–1883), who found their clientele by traveling from town to town in New England, frequently advertised portraits painted from both photographs and daguerreotypes (*Horace Bundy Broadside*, March 1851, Dodge & Noyes Printers, New Hampshire Historical Society, Concord). Advertisements show that portrait artists made use of photographs in a numerous ways. They used daguerreotypes to paint portraits of deceased family members, or as a visual aid that eliminated long sittings for the subjects of the painting. Some artists, such as the Itinerant artist Erastus Salisbury Field (1805–1900) created group portraits of large families from several photographic images of both living and deceased family members (*Ruben Gilbert Puffer Family*, c. 1857–650, courtesy Stephen P. Putter Family on loan to Historic Deerfield, Inc.). This type of photo-montage, painted in oil by Field or watercolors by other anonymous painters, often had the sitters appear much too small for the room they inhabited (Unidentified Photographer, *Campbell Family*, ca. 1870 albumen print photomontage with watercolor, George Eastman House, museum purchase).

Photographers and academic and self taught artists began to paint over enlarged photographs in the 1850s. In 1856 Mathew Brady was advertising "large portrait photographs printed on canvas and colored with oil paint." David Acheson Woodward (1823–1909)**,** a portrait painter and art instructor, patented a solar camera in 1857 that used light from the sun and copying lenses to enlarge a small negative onto large photographically sensitized paper or canvas. Many artists did not simply paint the photograph, but would use the photograph as a starting point, changing the background of the room, the pattern of fabric, style of the clothing, or expression of the face of the sitter. Erastus Salisbury Field who was experimenting with a variety of ways to use photographs in his work must have been familiar with D. A. Woodward's solar camera. Field, in his portrait of an *Unknown Woman* c. 1855, (formerly titled *Clarrisa Field*, oil on paper adhered to canvas, Museum of Fine Arts, Springfield, Massachusetts) took an enlarged photographic image on paper (photograph on file at the Museum of Fine Arts Springfield) and pasted it onto his canvas and then painted directly over the paper. Woodward brought his technique to Europe in 1859 where he influenced many painters including the French artist Leon Cogniet (1794–1880) who he met in England. Cogniet used Woodward's invention to paint the full length portrait of *M. Magne* over a photograph by Andre-Aldolphe–Eugene Disderi. *Phot-pientre* was the term used by Disderi to describe his process of printing enlarged images on canvas. Cogniet also created several preliminary sketches of the subject—so the photographic image was only one step used to complete the portrait. Almost a decade after Woodward's trip to Europe, Isaac Rehn's method of creating solar photographs was described in the *Philadelphia Photographer*, June 1868. The article reports that he prepared the canvas by brushing on a mixture of zinc white, egg albumen, ammonium chloride and silver nitrate. Most painters did not own a solar camera, but could obtain canvases with photographic images by sending negatives through the mail to photographers such as Albert Moore of Philadelphia who would enlarge the negative onto paper or canvas.

Political portrait paintings were more widely available as a result of photography. Portraits of American leaders such as Abraham Lincoln, Henry Clay, General Grant, John C. Calhoun, and Daniel Webster were in great demand for display in public buildings and in private parlors. Mathew Brady's Studio was a source for many of these photographs. Artists such Chester Harding (1792–1866), George P. A. Healy (1813–1894), George Henry Story (1835—1923)**,** and Thomas Sully (1783–1872) all used photographs to paint political portraits. George Healy's *The Peacemakers* (White House Collection) painted in 1868 shows a meeting that took place three years earlier. Healy used life sketches he made of Lincoln in 1862 and Brady's studio photographs of Lincoln, General Grant (1864, Library of Congress), General Sherman and Admiral Porter to paint this scene.

Landscape Painting

By the late 1840s, landscape artists began to alter the way they painted as a direct result of their exposure to landscape photographs. The ways that landscape painters were influenced by photography is wide-ranging. Calotypes and Collodion prints that blurred leaves on trees and placed areas of light and shadow into flat plans influenced Jean Baptiste Camille Corot's (1796–1875) paintings. Corot was part of a group of painters and photographers working in the forest near Arras, France. This group tended to prefer romantic naturalism which presented the spirit of nature in vague forms and soft focus. The photographer Adalbert Cuvelier and the

de Gaillard, Paul. Portrait of a Woman Seated in Profile.
The J. Paul Getty Museum, Los Angeles
© The J. Paul Getty Museum.

painter/photographer Constant Dutilleux were among this group.

Later in the nineteenth century, the United States Geographical and Geological expositions often included both painters and photographers, and they influenced each others work. The painter Thomas Moran (1837–1926) and photographer William H. Jackson were on the same exposition to survey the Yellowstone region in 1871, and Moran at times used photographs taken by Jackson in his paintings During the 1880s, photographers Timothy H. O'Sullivan, William H. Jackson, A. J. Russell, Jack Hillers and Edward Muybridge frequently relied on the framing devices of trees and mountains used by Hudson River School artists like Thomas Cole and Frederick Church. Hillar and Muybridge often sought out high vantage points in which to set up their cameras so they could offer an above ground view like those often found in Hudson River School paintings (John Hillar *Mouth of Zion Park*, c. 1872–73, albumen print, Denver Public Library.) Muybridge also manipulated his prints in the darkroom in order to express the aesthetic of landscape paintings.

Albert Beirstadt (1830–1902) was among the first American landscape artists to be influenced by photography. He was familiar with the large western photographs of Carleton Watkins (exhibited December 1862 at Goupil's gallery in New York) and Watkins' work encouraged him to go to Yosemite Valley. The work of Watkins and other landscape photographers most likely caused Albert Bierstadt to paint his landscapes from new vantage points with altered perspectives. Previously, Beirstadt had followed a tradition of landscape painting that placed the viewer's eye level well above ground. Imitating the new photographic views, Beirstadt began to paint landscapes from the ground level looking off to the base of mountains that soar above the viewer as in *Looking up the Yosemite Valley* (Haggin Museum, California). The other type of landscape view that

Bierstadt adopted from photography can be seen in *Thunderstorm in the Rocky Mountains*, 1859 (Museum of Fine Arts, Boston, gift of Mrs. Edward Hall and Mrs. John Carroll Perkins). In this work he placed the foreground, middle ground and distance all below eye level at the lower portion of his canvas. The way that Bierstadt painted the large rocks in *Thunderstorm in the Rocky Mountains* may also have been influenced by stereoscopes that brought dimension to objects in the foreground. Beirstadt's accurate rendering of geological and botanical forms leads viewers to believe that real scenes are represented in his paintings. His landscapes, were however idealized views that relied on truthful details.

The art critic John Ruskin (1819–1900) was interested in how photography could bring truthfulness to fine art. He studied daguerreotypes of architecture and landscape views in an attempt to capture their detail and tonal qualities within his own drawings. The Pre-Raphealite Artists, whose work he championed, used photographs as an aid in creating their paintings. Ruskin's writings, however, encouraged artists to paint from nature and only use photographs for drawing or studies. As time past, he grew even less enthusiastic about photography's role in painting, and wrote in 1868 that "I knew everything that the photography could and could not do;—I have ceased to take the slightest interest in it."

Impressionist Painters and Photography

Impressionist artists had a close association with photographers. In 1874, the conservative judging at the French Academy exhibitions prompted Claude Monet (1840–1926) and other Impressionists to exhibit their works independently in the studio of the photographer Nadar. French and American Impressionist artists, noted for painting out of doors (*en plein air*) using loose brush work, relied on photographs to understand the placement of forms, to capture particular times of day, and the changes of light and shadow on figures and the landscape.

The American artist Theodore Robinson (1852–1896) noted that "Painting directly from nature is difficult as things do not remain the same; the camera helps to retain the picture in your mind." Robinson first used photographs to create crayon portraits in the 1870s. He continued to use photographs as an aid in painting portraits and landscapes during his years in Giverny with Claude Monet. Robinson often used a grid on his cyanotypes or albumen prints as a guide to transfer the composition onto canvas. He stated that "I must beware of the photo, get what I can of it and then go." While transferring the photographic image on to canvas, he freely made alterations such as removing or repositioning objects and figures. Robinson's paintings *At the Fountain,* also entitled *Josephine in the Garden*, c. 1890, (Canajoharie Library and Art Gallery) was one of a series of paintings created after photographs of this subject (c. 1890, cyanotype, Terra Foundation for the Arts, Gift of Mr. Ira Spanierman, C1985.13). His oil on canvas of *Two in a Boat*, 1891 corresponds to his albumen print of the subject (Terra Foundation for the Arts, Gift of Mr. Ira Spanierman, C1985.1.1). Robinson used a grid on the photograph as an aid to transfer the forms of the boat and figures onto canvas, but omitted one of the boats that did not suit his sense of composition when he was painting the subject.

Nineteenth century painters were working from photographs that provided tonal variations, but no information about color. Impressionist artists used photographs in the same way they used pencil sketches. Impressionists usually remained faithful to the colors they recalled from direct observation. They had to rely on nature, their imagination and their talent as painters, to transform the photographs they used into paintings.

Portrait and landscape photographers often framed their subjects following traditions found in painting. Impressionist painters however, noticed that many photographs taken by amateurs did not follow these traditions and showed major figures, not framing devices, at the edge of the picture. This is demonstrated in many of Edward Degas' (1834–1917) paintings including *Carriage at the Races*, c. 1873 and *Bouderie*, 1873–1875. At times photographs captured awkward poses and cut off figures at the edge of the picture. Edward Degas noticed these images and began to purposely paint figures at the edge, rather than center of the canvas.

Degas' accurate copying of photographs also resulted in a new somewhat distorted perspective in some of his works. His paintings, at times, show large foreground figures and a much smaller scale for figures only a bit further away. This exaggerated perspective could be found in all styles of painting copied from photographs. It was often a point of criticism, and was even the subject of a Nadar cartoon in 1859 that ridiculed the exaggerated foreshortening and impossibly large shoes of a seated figure with his legs outstretched towards the viewer.

Nude Studies Used by Painters

Nude photographs were used by artists as studies for painted figures. Eugene Delacroix and (1798–1863) Gustave Courbet (1819–1877) were both drawing and painting nudes from photographs by the mid 1850s. Eugene Durieu, and Julien Vallou de Villeneuve were among the many photographers in France providing nude studies to painters. Paul Cézanne used a photograph of a nude male for his painting *The Bather,* c. 1885 (Museum of Modern Art). In this painting, Cézanne transformed a photographic image of a nude male in a

static pose standing on a rug (Unknown photographer, Museum of Modern Art) into a walking figure in a landscape.

The American realist painter Thomas Eakins took photographs of nude models for his paintings, and provided his students with nude studies of himself and others. The nude figures in his paintings *Arcadia,* 1883 (Metropolitan Museum of Art) and *Swimming*, 1885, (Amon Carter Museum, Fort Worth, Texas) were created by copying figures from photographs. Sometimes Eakin's combined individual nude studies such as his photograph of Susan Macdowell Eakins, c. 1883 (Pennsylvania Academy of Fine Arts) into larger figure groups within a landscape setting.

Motion in Photographs andPaintings

Impressionist artists copied the blurred images caused by the movement of figures and slow exposure times in order to express motion in their paintings. This can be seen in Robinson's painting *Gathering Plums*, 1891 (Georgia Museum of Art, University of Georgia, Eva Underhill Holbrook Memorial Collection of American Art) where the artist faithfully copied the blur caused by the movement of the plum pickers hands.

Exposure times of 1/50th of a second were possible as early as the late 1850s. The reduced exposure time allowed for instantaneous photographs of city life. By 1861 the London Stereoscopic Company was boasting that their photographs showed horses legs and walking figures "without a blur." Stereoscopic photographs often showed these snapshots of city life with walking figures in poses not traditionally found in art.

Edward Muybridge's instantaneous photographs influenced a number of painters in the 1880s. Muybridge's 1872 commission to photograph race horses in motion resulted in photographs that contradicted what had been depicted in paintings, and lead to his open criticism on the way that Realist artists such as Rosa Bonheur (1822–1899) painted horses. The actual motion of a running horse's legs was recorded by Muybridge placing a bank of cameras along the race track and taking a series of stop action photographs. The photographs revealed that all four hoofs actually left the ground, but not in a way actually depicted by painters. By the 1880s Muybridge was lecturing and using lantern slides to compare his photographs of horses in motion to famous paintings he felt did not accurately represent the horse's movement.

Edward Degas (1834–1917) and Thomas Eakins (1844–1916) responded in different ways to this new visual information. Eakins took a scientific interest in animal locomotion and his painting *May Morning in the Park* shows horses trotting in front of a carriage in a manner demonstrating the influence of Muybridge's photographs *The Horse in Motion Abe Edgington trotting* (photographic print on card, The Library of Congress) and *Lizzie M trotting, harnessed to sulky, Animal Locomotion pl 609.* (1884–86). Muybridge's book *Animal Locomotion* included human motion which also intrigued Eakins. The American Realist artist was particularly interested in how muscles in the human body worked and used sequential photographs of figures walking to gain insight into how to paint a figure in motion.

Both Degas and Eakins, not only studied Muybridge's photographs, but also took their own photographs of figures in motion. Degas was particularly interested in painting ballet dancers and photographed them to better understand how they moved. Paintings such as *Carriage at the Races*, c. 1873 (Boston Museum of Fine Arts), and Eakin's *May Morning in the Park*, convey motion through the accurate rendering of the horses' legs and also by positioning the subjects at the edge of the canvas to show that they are traveling across a landscape that continues beyond the picture's edge.

More to Discover about Individual Artists and Their Use of Photographs

Painters found many ways to use photographs in combination with preliminary sketches or to replace pencil studies for paintings. Both Impressionist and Realist artists drew penciled grids on their canvas to aid copying photograph images onto canvas. The French artist Jules-Meuenier projected glass lantern slides on to his preliminary drawings which he then transferred to canvas. Eakin's also traced projected images onto his canvas. Other artists, including Eakins, used a pantograph that allowed lines traced on the photograph to be transferred in a different scale onto canvas.

While most painters in the second half of the nineteenth century found some use for photographs as an aid in creating their work, they did not always openly admit to their reliance on photographs to their public and art critics. During the 1880s, artists including Eakins and the French Realist Pascal Aldolphe-Jean Dagan-Bouveret (Photograph of the artist working at Ormoy from a model on *The Pardon in Brittany*, 1886, Metropolitan Museum of Art, Archives dela Haute-Salone, Vesoul, France) went so far as to pose for photographs depicting them painting from a live model, when they in fact had relied heavily on photographic studies to create the painting. Conservators and art historians looking closely at nineteenth century paintings, artists' letters and journals will continue to uncover information about how photographs were used by individual artists.

DIANE E. FORSBERG

See also: Morse, Samuel Finley Breese; Daguerre, Louis-Jacques-Mandé; Daguerreotype; Calotype and Talbotype; Muybridge, Eadweard James; Ruskin, John; Delacroix, Ferdinand Victor Eugène; Courbet, Gustave; Eakins, Thomas; and Nudes.

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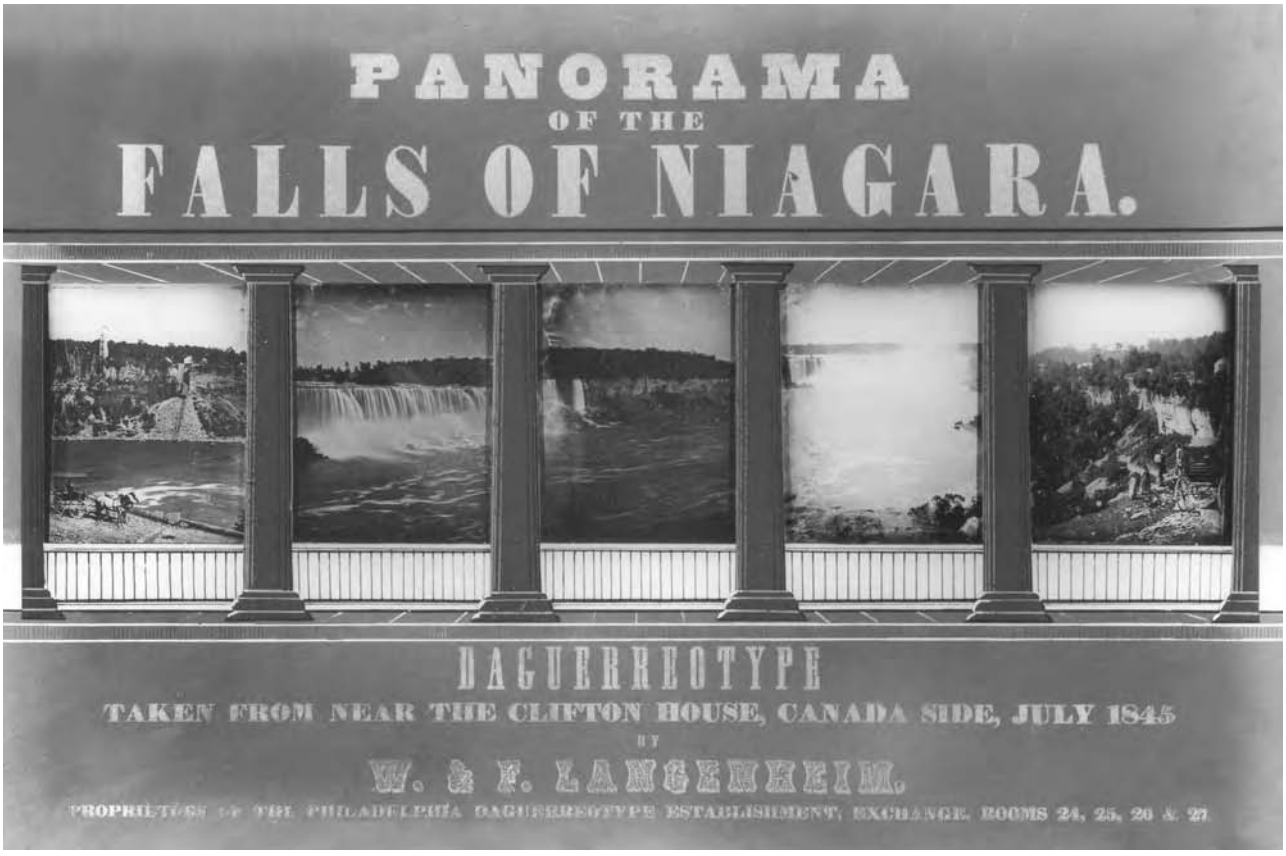
PANORAMIC PHOTOGRAPHY

Since its birth, photography sought to compete with human vision by the reproduction of reality; with the panorama, it succeeded in exceeding it. The panorama indicates, in photography, an image of the broadest possible angle of vision (up to 360°); it thus exceeds the extent covered by an ordinary lens (50°) and that covered by the human binocular vision (approx. 160°). It follows in the fashion of the painted panoramas presented in specially built rotundas, whose prototype was patented by the Scot Robert Barker in 1787 and who knew a great vogue in the first half of the nineteenth century. The painters also had the idea to use photography to save time in the realization of their painted scenes. One of the most famous examples is the The Siege of the Malakoff by Colonel Charles Langlois, made of 14 plates, created in 1855 and inaugurated in 1860 on the Champs-Elysées. To help in the project, he was assisted in the photography by Leon Méhédin and in the printing by Frederic Martens.

A photographic panorama can measure a few centimeters or several meters, and consist of only one or several assembled prints. It is obtained by means of a «wide angle» lens or from an ordinary lens assembled on a special apparatus. The nineteenth century distinguished four categories of panoramic images: panoramas of views, consisting of a lengthened image, carried out with only one lens and in only one take; panoramas formed of the juxtaposition of several views; panoramas realized by a mobile lens allowing the coverage of an angle of 150° (since 1845); and panopticons, views embracing a complete horizon or more (since 1890). Initially, the juxtaposition of several prints proved to be an effective means to widen the field of vision; but the photographers were not satisfied with this type of properly pictorial representation. The photographic panorama acquired its autonomy thanks to the invention of special apparatuses known as panoramic.

On June 23, 1845, Frederic Martens, who in the 1830s created engraved panoramas of the large towns of Europe then towards 1840 created engravings according to daguerreotypes for the Lerebours' *Excursions daguerriennes*, presented at the Academy of Science the first panoramic room for daguerreotype; this room, known as also Mégascope, was marketed by Lerebours. The principle is as follows: an ordinary lens laid down on a pivot traverses all the points of the horizon according to a horizontal movement produced by a crank; this objective makes it possible to take photographs of 12 × 38 cm, very clear on the surface, embracing an angle of 150°. The daguerreotype marries the cylindrical curve of a drum; thanks to this curve, the points most unequally distant are brought to the surface of the plate, which is rectified after the shot is taken. The clearness of the image is due to a vertical narrow slit at the bottom of the box which follows the objective in its movement; this slit lets only the central rays act on the sensitive layer. An expensive and cumbersome device, being able to produce only daguerreotypes, this apparatus was dedicated to a restricted use.

In 1848, Napoleon Garella, a mining engineer in Algiers, eager to apply panoramic photography to his work, obtained two tests rectified with its "planopanoramic," "rectilinear" apparatus, which did not require bending the plates of daguerreotypes: the sensitive plate turned with the lens, which allowed the use of plain negatives. In 1850, Peuvion adapted this device to negative glass. The field of vision covered by this type of apparatus is of 180°, that is to say half of a view. In 1856, Martens Schuller, nephew of Martens, reached a similar result starting from the invention of his relative, by applying the principle of the revolving unit of Garella to the ap-



Langenheim, William; Frederick Langenheim. Panorama of the Falls of Niagara.
The Metropolitan Museum of Art, Gilman Collection, Gift of The Howard Gilman Foundation, 2005 (2005.100.495) Image © The Metropolitan Museum of Art.

paratus of his uncle. This apparatus includes a lens of 15 cm focus, turning on itself. The sensitive glass plate must follow the lens in its movement while being maintained constantly in relation to him and equal distance. Instead of the lens alone, all the camera turns around the pivot fixed under the axis of the objective thanks to a mechanism of casters. The frame carries the glass plate in a carriage to casters and turns too. The plate presents thus successively all the parts of its surface at the narrow slit. The rotating movement can be regulated by means of a mechanism or be directed by hand, which makes it possible to prolong or decrease the installation according to the light. The apparatus can thus carry out a whole review; very clear iamges are obtained. The disadvantages of this apparatus are the slowness of the preparation of the glass plates, their weight and their brittleness.

In 1858, Garella improved his first apparatus, resulting in a type close to that of Martens Schuller. The same year, Ross manufactured in London an apparatus designed by Sutton, for curved plates and provided with an angular large objective of 120°. In the 1860s, the inventions multiplied. In 1862 the patent of the pantoscope of Johnson and Harrison in London was registered, for plates with collodion; to the exposition of the Société française de photographie of 1865, Brandon exhibited a panorama taken on top of the Saint-Jacob Tower in Paris, with this apparatus. In 1865, Martens, who continued to improve his invention, obtained a view on only one negative, of a great clarity. In 1867, the Abbé Rolin presented at the SFP a panoramic apparatus allowing the creation of several partial shots forming a panorama, on the same plate.

In these first three categories of images the principal photographers of the years 1850–1870 illustrated themselves, who saw in the panorama a technical challenge; one could see many examples of them in the exposures (panoramas of cities, of mountains) signed Baldus, Bisson, Braun, Gray (scene of Châlons), Marville for France, Hill and Adamson for the United Kingdom. In addition to insistence on the effect of the illusion produced, criticisms generally commented on the homogeneity of the tone and the connection between the prints. The World Fairs, which emphasized the wonders of nature and the richness of the colonial empires, and which resorted to the new medium, exhibited many panoramas. In 1851, Martens was distinguished at the Great Exhibition in London for his panoramic images on

albuminous glass. In 1855, he showed at the Exposition Universalle, Paris views of the Alps (on this occasion, the critic Ernest Lacan called him the "photographer of the mountains") in particular a panorama of Mont Blanc composed of fourteen prints and one of the Geneva Lake, "one of those scenes in front of which one stops seized by surprise and admiration" (Louis Figuier). In spite the many panels repainted, the sight of Mont Blanc was appreciated for its smoothness: "Nothing is more admirable nor more imposing than this panorama. One recognizes there the feeling and the key of a consumed artist, and, as for the exactitude of the details, it is enough to have an idea of it, to compare the photographic tests, placed around, with the parts of the drawing which reproduce them. Not a stone was forgotten, not a piece of ice has escaped the scrupulous hand of the artist "(Ernest Lacan). In 1855 also, the Bisson brothers exhibited a 150 cm-long image of Paris. Baldus, using the apparatus of Garella, showed a picture of Mount-Gilds with the lake Chambon, 130 cm long, and a picture of the interior of the arenas of Arles, both discussed by critics. At the 1867 Exposition Universalle, the Abdullah brothers showed a panorama of Constantinople that was 220 cm long.

One could also see panoramas at the exhibitions of the Société française de photographie. In 1859, Sinigaglia, photographer of Padua, exhibited a picture of Venice in ten prints, almost four meters long. In 1861, Jeanrenaud, who used the apparatus of Sutton, exhibited a panorama of Thoune, which Lacan considered to be full of charm and harmony. In 1861, Baldus showed a Panorama of Tuilleries and the Louvre, which offered a view of two hundred degrees, about which a critic said that it " is beyond imagination, almost inducing dizziness" (Ladimir). In 1865, Gueuvin exhibited two panoramas of Paris taken from the Tower Jacques Saint, each forming an angle of 180°, taken with the apparatus of Koch and Wilz; Gaudin noted that they seemed to have been taken from a single viewpoint after the juxtaposition of different negatives, so that the junction was successful. In 1869, Koch and Wilz presented panoramic pictures obtained with their apparatus: a panorama of Paris capturing seven bridges, a great panorama of Meudon, Bellevue, Sevres.

The panorama had various scientific applications, like the technique of the photogrammetry of Colonel Laussedat around 1850–1853 (land surveys and soldiers). Paul Perier, who had percieved the views of the Alps de Martens not through photography, "but a kind of geological plan, a work of geographer or engineer" (1855), seemed to foresee the work of Aime Civiale, who provided panoramas of mountains to the best scientists, and more particularly geological, without artistic claim. He showed some at the SFP; in 1863, he showed a circular panorama close to Monte Moro and a panorama of l' Oberland; one of them measured eighty centimeters high and four meters long.

It was necessary to await the manufacture of flexible film in gelatino-bromide in the 1880s to see panoptiques appear (complete view). In 1883, Moessard invented the cylindrographe, patented in 1889 (same principle as Martens): two prints were necessary to obtain a whole panorama. In 1889, the apparatus of the Benoist brothers made it possible to obtain a complete view on glass.

The most important invention was, in 1890, the Cyclograph of Damoizeau. A camera is assembled on a swivel slide on a circular plate. A frame with rollers containing two reels of films allows a compact device and a reduced format of the apparatus as a whole. A clockwork motor rotates a cylinder containing the film, and the same clockwork motor rotates the camera. The same mechanism thus activates the rotation of the apparatus and the unfolding of the film in opposite direction, which makes it possible to produce images of great clarity. The clockwork is at variable speed, involving a more or less long rotation. A meter indicates the quantity of film available. An lens of 50 cm focus requires a 30 cm length plate and can produce a panorama of 3,14 m. It allows the use of lenses of different focuses and thus the creation from views of considerable length. This apparatus is characterized by its perfection and its simplicity of operation. It was shown with the Colombian Exhibition of Chicago in 1893 and taken again by Sheldon to the United States.

In 1895, Ducos du Hauron discovered the principle of the Microcosm (a silver plated ball reflects the image on to a flat plate or film). In 1899, Louis Lumière invented Photorama which made it possible to see the views of panoramic images and take pictures at the same time (systems of drums). Photography then exceeded the limits of the field of ordinary vision by showing on only one image what the human glance can see only while moving. The image becomes the ground of infinite investigations, out of the reference mark of the traditional prospect. From a faithful search for reproducing reality, this photographic technique leads to going beyond this reality.

HELENE BOCARD

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PANUNZI, BENITO (1819–1894)

Nothing is known of his whereabouts before he arrived in Argentina.

He was a painter and architectural draughtsman, and is known to have taught drawing. The first national census (1869) records him as an Italian, 50 years old, single, a photographer with a studio at 55th Cuyo Street, Buenos Aires. The studio was named "Fotografía Artística."

He published country views, mostly from Buenos Aires and surroundings, accompanying them with a nice paper folder (583 mm by 430 mm), titled: *Fotografía Artística—Album de Vistas y Costumbres de Buenos Aires*. The images then were bound in albums.

The earliest known dated photograph is from 1868 (the seventh one), so, usually it is supposed that he started keping records not too before 1866. Usually he received, wrongly, the authorship of a small and crude album *Vedute di Buenos Aires*.

Excellent copies of his works are kept in Archivo Audiovisual de Venezuela—Biblioteca Nacional and private Argentine collections.

ROBERTO FERRARI

PAPER AND PHOTOGRAPHIC PAPER

Paper has played an essential part in photography initially in the late 1830s and 1840s as a support medium for both the negative and positive, and increasingly from the 1850s, as the principal means of producing a positive, on commercially produced photographic papers. During the initial period the quality of the paper was crucial to the end result while later on it was mainly a support to new photographic emulsions and printing processes being developed.

During the period up to the early 1850s, paper for photographic use was usually selected and coated by the photographer, although some retailer's such as London's Horne, Thornthwaite and Wood offered pre-iodised, waxed and albumenised papers. All the manuals of the period and instructions to amateurs gave clear advice on selecting paper for photographic use.

W.H. Thornthwaite writing in 1853 stated: 'There are various kinds of paper I have found well suited for the purpose, but that manufactured expressly by Turner, the blue wove of Whatman, and the positive paper of Carson Frères, of Paris, appear to produce the best results.' He continued: 'those sheets only are to be employed which are of an even texture and free from specks and water-marks; these specks should be carefully avoided, as they are generally small particles of iron left in the substance of the paper during the process of manufacture, and which, brought in contact with any salt of silver, speedily produce a brown stain on the paper of considerable size. The suitableness and quality of the paper is best ascertained by holding each sheet opposite a strong light, either of a window or lamp, and when approved a pencil mark should be made on one side of each sheet for the purpose of distinguishing it when required.' Thomas Sutton in his *Calotype Process* (1855) recommended Hollingsworth paper for negatives which he had specially made for the purpose of negatives. He described it: 'It is truly excellent, giving intense blacks, fine definition and beautiful half-tones. It improves by age; and, in fact, it is not in first-rate condition until it has been made for a year or two'.

These statements make a number of wider points about papers. There was general agreement that English papers were preferable to those of foreign manufacture. W.H.F. Talbot and his employees used J. Whatman Turkey Mill papers made at Hollingsworth's Mill at Maidstone, Kent, and R. Turner's Chafford Mill was also recommended. English papers were generally sized with gelatine while foreign papers were sized with starch leading to a better quality and improved light sensitivity through the organic compounds present in gelatine, a fact which was realised later and made use of.

The quality of the weave of the paper and effect on wet strength and finer 'grain' of the paper was crucial in producing more detailed negatives and chemical cleanliness all had a bearing on the quality of the final image. J.B. Hockin in his *Practical Hints on Photography* (1860) recommended English papers for Calotype photography and French paper, notably that made by Canson Frères, which was sized with starch, as being best for the waxed paper process.

There were other requirements for printing papers and other preferences amongst contemporary writers. Sutton stated that 'the paper commonly employed for positives is that manufactured in France by Messrs Canson frères' and he preferred the heavier weight although it was, he said, more inclined to chemical spotting than the lighter weight. He expanded on this by saying that the papers manufactured by Turner and Whatman although more sensitive than the Canson frères had a courser grain leading to poorer definition in the final Calotype print.

Hockin describing the printing of collodion negatives detailed what was required from the paper: 'that it be fine and close grained, with a very smooth surface, and sufficiently permeable to the liquids employed, without being rendered by them prone to be readily torn during the long series of washings and manipulations to which it is to be subjected. It should also be free from any "water-mark," and most especially free from metallic or other particles which induce ineradicable defects in the pictures.' Different qualities were required from the

paper depending on whether it was to be used simply as salted paper or as albumised and salted. For the former Hockin recommended English paper (Towgoods) and for the latter foreign papers only were suitable, the result of their being sized with starch which 'confers upon them a certain permeability by the very glutinous liquid, without detracting much from their strength or rendering them bibulous.'

Gustave le Gray writing in 1853 on the waxed-paper process stated that very thin paper from Lacroix or Canson Frères was required for making waxed-paper negatives. This was expanded on by Roger Fenton, an acknowledged practitioner of the process, who stated that the 'beauty of the results depends much upon a judicious selection of [paper].' Fenton noted that Whatmans and Turners paper were recommended for their firmness and evenness of texture but that their gelatine sizing limited their suitability for photography. Paper from the Whatman mills from 1832–1838 was preferred as it was thinner and less highly sized and was 'much used by the French, who say that it gives better halftones, and supports the action of the gallic acid for a longer time.' Fenton recommended thin Chanson paper despite it being prone to iron spots which was sensitive, being sized with starch, one side was smooth and made from courser rags than the Whatman paper which gave it greater strength. Lacroix paper was similar in quality but with less spotting although slightly coarser.

In summary the three main paper processes, the Calotype and waxed-paper for negatives and printing paper each required different qualities from paper with the former more suited to English papers and the latter two to European papers.

The appearance of the collodion negative on glass from the early 1850s saw a rapid decline in the use of paper negatives and from the 1860s the major use of paper in photography was for the production of photographic postives. Increased commercialisation of photographic printing, the preparation of sensitised papers on a large scale and new processes affected the paper requirements through the rest of the nineteenth century. With the ready availability of pre-prepared printing papers the early range of papers tested and prepared by photographers was reduced to those available commercially which by the end of the century had expanded to large range of types, surfaces and weights.

The printing out process with paper made light sensitive through silver nitrate and salt goes back to pre-1839 experimenters and was used by Talbot and Herschel in 1839. These silver chloride papers remained the dominant type over silver bromide papers throughout the century because of their stronger blacks. The coating of paper with albumen to produce finer prints by overcoming the grain and porosity of paper was described by Blanquart-Evrard in 1850. Once and twice albumenised papers superseded starch and gelatine-filled silver chloride papers which had been introduced in the 1850s. Albumunised papers remained popular until the 1890s.

Experimentation and the development of permanent emulsion printing papers was advanced by the work of G. Wharton Simpson who developed collodio-chloride silver emulsion printing process, later called the celloidin process. This work was complimented by the work of J.B. Obernetter (1840–1887) of Munich who was the first to manufacture collodio-chloride papers on a commercial scale. The paper was claimed to have greater definition and permanency over the albumen papers that it gradually displaced. Colonel Abney in a paper read before the Photographic Society described gelatine chloro-citrate papers which led to their subsequent commercial manufacture.

The rise of the amateur photographer using dry plates and later rollfilm encouraged a demand for permanent and easily workable printing papers. By 1890 gelatino-chloride silver emulsion papers (aristo papers) and collodio-chloride silver papers (celloidin papers) had almost completely displaced the earlier albumen and starch papers.

The other principal photographic paper is use during the later nineteenth century was gelatine silver bromide paper. In 1874 Peter Mawdsley of the Liverpool Dry Plate Company described the possibility of using gelatine silver bromide papers for photographic printing which he believed was 'destined to play a most important part in the future of dry plate photography.' (*Yearbook of Photography* 1874) He manufactured such papers commercially emphasising their sensitivity and matt surface which was suited to over-painting. Mawdsley met with limited commercial success and it was Sir Joseph Swan (1823–1914) who in 1879 was granted British patent number 2968 for photographic printing paper coated with bromide of silver. The patent noted that the paper could be employed in a long band and prints made as the band advanced allow for large runs of prints to be made. Swan emphasised the short exposure in weak artificial light that would ensure successful results for the amateur.

Factories manufacturing silver bromide papers opened in France by E Lamy at Courbevoie and in Britain by Mawson and Swan, Morgan and Kidd and Marion & Co amongst others. Silver bromide papers, being more sensitive than the better quality silver chloride papers, as a medium for rapid printing with artificial light and for enlargements was rapidly adopted from 1880. To meet this demand emulsion coating machines for paper and plates were developed in Germany, Britain and the United States. Matt surfaced silver bromide papers were introduced from 1879 using starch paste instead of

gelatine and the Eastman Kodak Company introduced it's own matt papers which it called 'platino' from 1894. Matt papers displaced the more usual glossy papers for commercial and artistic photography although glossy papers were used in certain areas because of its greater resolution of detail.

Automatic printing machines were also developed the first of which was patented in 1883 by Schlotterhoss in Vienna. By the mid-1890s mass-production of photographic postcards using silver bromide papers was commonplace. Between 1895 and 1913 Arthur Schwartz's Neue Photographische Gesellschaft in Berlin had produced 40 million metres of photographic paper.

Silver chloride and silver bromide papers were not the only photographic paper in use. Other photographic printing papers using variants on the basic silver chloride and bromide formulae and new papers extended a demand for papers and commercial manufacture.

Gelatine silver chloride positive paper was first described by Eder and Pizzighelli in 1881 and large scale manufacture started from late 1882 by Dr. Just in Vienna. Leon Warnerke in London started the production of gelatine silver chloride paper in 1889 appreciating the warm tones compared to the cold tones achieved with silver bromide paper. Increased appreciation of gelatine silver papers and the marketing of such papers by the Eastman Kodak Company under the Velox tradename led to the dominance of this type of paper in the twentieth century.

Gelatine silver bromo-chloride emulsions for prints were described in 1883 and a range of papers was marketed in Britain under the Alpha tradename from the later 1880s and by Ilford Ltd under the clorona name and by other European manufacturers.

Self-toning papers which incorporated gold chloride or platinum were manufactured from the 1890s to improve the final colour of the print from the typical reddish colour to a more acceptable sepia to brown prints. Two new processes in the 1870s led to the development of a new range of papers. William Willis's (1841–1923) platinotype process patented in 1873, 1878 and 1880 led to the commercial introduction of a range of platinum papers manufactured for the trade and amateur use through his Platinotype Company. He also developed the palladium process requiring palladiotype paper and a silver-platinum paper, satista. These also saw commercial success.

The other area that saw the commercial development of new papers was the introduction of pigment processes. Swan's transfer process of 1864 was developed commercially by the Autotype Company which manufactured and sold pigment papers exclusively. The gum bichromate pigment process, popular from the mid-1890s also allowed companies to produce special papers and other transfer processes such as bromoil moved paper away from a purely sensitised base.

The 1870s and 1880s saw a short-lived return to paper being used as negative support in an effort to develop smaller and more portable cameras suitable for amateur use. Leon Warnerke in 1875 produced dry collodion silver bromide films on chalk coated paper which could be stripped. This was not successful but the idea was resurrected by George Eastman in 1884 who developed a paper film using a specially developed coating machine which he patented in 1885. The sensitised paper roll was used in an Eastman-Walker roll holder and attached to the back of a camera. The grain of the paper was intrusive and was replaced by a stripping film where the paper served as a temporary carrier for the emulsion layer which was transferred to a glass plate after development. The introduction of celluloid from 1888 as a carrier for photographic emulsion in 1888 quickly superseded paper roll film, although glass remained the main support for professional photographic emulsions until the 1960s.

The use of paper throughout the nineteenth century saw a move away from the paper being critical to the effectiveness of the process to one where the paper was primarily a carrier for a silver halide photographic emulsion and, later, non-silver emulsions and pigments, leading manufacturers to develop increasingly specialist surfaces and weights of photographic paper for increasingly specialist or aesthetic ends.

MICHAEL PRITCHARD

See also: Sutton, Thomas; Whatman, J. & Co.; Talbot, William Henry Fox; Calotype; Talbotype; Dry Plate Negatives: Non-Gelatine, Including Dry Collodion; Le Gray, Gustave; Cameron, Henry Herschel Hay; and Blanquart-Evrard, Louis-Désiré.

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PARKER, JOHN HENRY (1806–1884)

English publisher and photographer

John Henry Parker, publisher and bookseller from Oxford became Director of the Ashmolean Museum, Oxford, in 1870, published *The Manual of Archeological Terminology* (1836), and *The Manual of Gothic Architecture* (1849). After he came to Rome in 1863, he founded the British and American Archaeological Society of Rome in 1865 and carried out several excavations on behalf of the Pope. He became convinced that photography was a more accurate method of recording

than drawing and was the first to demonstrate the use of photography in archaeology and to use magnesium lighting for photography by artificial light. From 1866 onwards he commissioned the Italian photographers, Giovan Battista Colamedici, Carlo Baldassarre Simelli, Francesco Sidoli, Filippo Lias, De Bonis and Filippo Spina as well as the Canadian, Charles Smeaton, to document the 'Antiquities of Rome from the Classical Age to 1600.' In 1869 his catalogue had 1500 images and by 1879 boasted 3391 which he published in reproductions, issued in 12 parts from 1874–1878 as *The Archaeology of Rome.* A set of actual photographs was offered in 1879 as *A Catalogue of Three Thousand Three Hundred Photographs of Antiquities in Rome and Italy*. The majority of the plates however were lost in a fire in 1893 and there are only three nearly complete sets of the photographic prints known, one is at the British School at Rome.

Alistair Crawford

PARKES, ALEXANDER (1813–1890)
English inventor

Alexander Parkes, the originator of over eighty patents during his career, covering a range of inventions in metallurgy, rubber, vulcanisation, and plastics, was born in Birmingham, the fourth of eight children, and would eventually have twenty children of his own—eight by his first wife, twelve by his second.

Parkesine, the invention for which bears his name, was the first plastic material based on cellulose nitrate, and was introduced during the 1862 International Exhibition in London. As such, it predated and predicted the massive plastic industry which has emerged subsequently. Indeed, Parkes anticipated many of the uses to which cellulose-based plastics might eventually be applied.

Four years later, in 1866, he established The Parkesine Company to market the material, and an alternative to rubber, or the gutta-percha and shellac-based thermoplastics which were then in vogue. The company was based in Hackney Wick in London.

Despite the great expectations Parkes had for his new material, The Parkesine Company ceased manufacture after only two years, and closed with significant debts. Parkes had anticipated being able to market the material at a price of less than a shilling per pound, a target which proved unachievable.

His work, however, laid the foundation for the modern plastics industry. The American John Wesley Hyatt introduced the most significant product based on cellulose nitrate, with the development in 1863 of *celluloid* on which photography for so long depended.

John Hannavy

PATENTS: BRITAIN AND EUROPE

Britain's first patent relating to photography was granted to the patent agent Miles Berry on behalf of Louis Jacques Maude [*sic*] Daguerre and Joseph Isidore Niepce, junior, on 14 August 1839 for the daguerreotype process. Richard Beard, who had licensed Daguerre's process, was granted the next in June 1840 for an improved camera with internal mirror and improvement to operating the process. The third was granted to William Henry Fox Talbot for his calotype process. The 1840s saw only eleven photographic patents being granted.

The Great Exhibition of 1851 acted as a catalyst for reformed patent law as manufacturers and patentees sought greater protection and attempted to meet increasing competition from the United States, although the resulting Act only partially met their demands. In comparison with the American system Britain's patent process left much to be desired for patentees. The Patent Law Amendment Act of 1852 reduced the cost of a single patent for the United Kingdom to £25 (plus renewal fees) from a previous minimum of £310 and the application process was simplified. The number of photography patents increased. The 1850s saw 185 classified by the Patent Office as photography, the 1860s 273 and the 1870s 213. The 1883 Patents, Designs and Trade Marks Act further reduced the cost of a patent and simplified the application procedure and during the 1880s 750 photography patents were recorded with the next decade, the 1890s showing 1778. The Patent Office photography classification included some subjects that were not strictly photographic such as emulsions and stands and some patents that might be seen as photography were included in other classifications such as advertising and printing.

Unlike the American system, under the British patent system there was no requirement for the applicant to show novelty and many patents were simply variants on existing designs rather than novel designs of apparatus, chemical processes or applications of photography. The two Patent Acts of the nineteenth century each coincided with significant changes to photographic technology which led to significant increases in the number of patents being applied for and in the areas in which patentees were applying for patents. The 1860s, for example, saw a significant number of patents relating to photographic printing and photo-mechanical printing processes and the latter remained strongly represented until the 1890s. In the 1880s and 1890s patents for roll holders were widespread, as were those for shutters and studio and flash illumination. In the 1890s as new technology began to coalesce into practical applications kinematography patents started to appear regularly and from 1896 Röntgen, or X-ray photography, was represented for the first time.

In Europe there were different patent systems operating which offered varying degrees of protection to the patentee. In France the modern patent system was established by 1844 and consisted of a simple registration system with the state remaining an active participant in managing both the patents and their exploitation. An inventor could choose between a patent or offering an invention to the government in returned for an award from a special fund. Until 1902 patent specifications were not published although the original application was available for inspection. In Germany unified national patent legislation was passed in 1877 which established a central office for granting patents. Government policy was intended to encourage economic development and in some areas, such as chemical products patents, were prohibited. The government encouraged the diffusion of patent information by publishing claims and specifications before they were granted. From 1891 a *gebrauchsmuster* offered a parallel but weaker system of protection through a registration system.

Elsewhere in Europe two countries took a view that patents were not morally acceptable. The Netherlands reinstated a patent system in 1912 and Switzerland in 1888 mainly as a response to international pressure.

Japan, as part of its modernization policy during the mid and late nineteenth century, sent an envoy in 1886 to examine the European and American patent systems. As a result the first national patent law was passed in 1888 copying many features of the American system which were considered superior to the various European systems, although it placed many restrictions on patentees. A new law was passed in 1899 after Japan signed the Paris Convention which brought it into line with the convention and extended patent protection to foreigners.

Despite some serious deficiencies in its patent process the British patent specifications record some of the key developments in photography. Some notable patents include the Woodburytype process (number 2338 of 1864 and others), the platinotype process (number 2011 of 1873) and the Kodak camera (number 6950 of 1888). Many other British patents are unlikely to have ever been produced commercially. Several innovations that one might have expected to be patented were not, the most significant being Frederick Scott Archer's wet-collodion process which he published and made freely available in 1851 ensuring a wide-spread and rapid adoption compared to the patented daguerreotype and calotype processes. Both of those were robustly defended through the law courts.

MICHAEL PRITCHARD

See also: Daguerre, Louis-Jacques-Mandé; Talbot, William Henry Fox; Daguerreotype; Calotype and Talbotype; Woodburytype, Woodburygravure; Platinotype Co. (Willis & Clements); and Kodak.

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PATENTS: UNITED STATES

In order to encourage improvements in the applied arts, the United States government in 1790 gave inventors (citizens and non-citizens) temporary, exclusive rights to profit from their inventions. The purpose was to promote public good through individual ingenuity; the incentive was the guarantee of ownership and attendant profits. Patent rights, however, were limited. The original Patent Act of 10 April 1790 fixed the term of U.S. letters-patent for inventions at no more than fourteen years; in 1861 it was expanded to seventeen years.

In spite of the protest mounted by some in the photographic community who believed that photography could only be advanced by the free exchange of ideas, most involved in the business understood that the costs associated with patent rights were an inevitable part of doing business. However, exclusive patent rights were frequently challenged, especially if the patentee defined his invention so broadly that others could easily be accused of infringement. And patent holders who insisted upon substantial fees sometimes found themselves outfoxed by others who circumvented their patent rights by inventing slight modifications, for which they too could apply for and receive a patent.

Particularly contentious was the fourteen-year controversy surrounding three patents issued in 1854 to James A. Cutting. In one of these patents, *Improvement in Compositions for Making Photographic Pictures* (11 July 1854, No. 11,266), known as the bromide patent, Cutting had modified Frederick Scott Archer's collodion process to include bromide, which made film more light-sensitive and thus speeded up the process. Since the patent included all wet-plate photography, it would be hotly contested by the full photographic establishment who saw it as a threat to the progress of photography, collodion being a new and important medium for making both positives and negatives.

Some of the most important photographic patents of the hundreds that were granted in the nineteenth century are the following. The first U.S. Patent in photography was issued in 1840 to Alexander S. Wolcott for his *Method of Taking Likenesses by Means of a Concave Reflector and Plates So Prepared as that Luminous or Other Rays Will Act Thereon* (8 May 1840, No. 1,582). His reflector shortened the time of exposure in the camera when taking a daguerreotype. Ann F. Stiles was the first woman to be issued a photographic patent. Her invention, a *Case for Daguerreotype-Pictures* (22 January 1850, No. 7,041), consisted of a tube-like case in which one could view a small daguerreotype through a magnifying lens. Albert S. Southworth was issued a patent for a *Plate-Holder for Cameras* (10 April 1855, No. 12,700), which allowed the photographer to prepare one plate then slide it into place for multiple views in rapid succession, or for stereoscopic views on one plate. Edward J. Muybridge received two patents for an *Improvement in the Method and Apparatus for Photographing Objects in Motion* (4 March 1879, Nos. 212,864 & 212,865) for instantaneous photography, where the subject is in rapid motion. George Eastman's patent for a *Method and Apparatus for Coating Plates for Use in Photography* (13 April 1880, No. 226,503), transformed photography from wet plate to dry plate by making commercial gelatine dry plate affordable. His machine could spread gelatine emulsion easily and uniformly over glass, and eliminated the early problems with the process.

Patents were not only issued for photographic methods, but also for albums, cases, stereoscopes, cameras, stands, head rests, burnishing tools, printing frames, plate holders, photographic backgrounds and baths, etc. Whereas many patents saw their way to manufacture or use, others were quickly abandoned or never realized.

JANICE G. SCHIMMELMAN

See Also: Cutting, James Ambrose; Eastman, George; Muybridge, Eadweard James; and Southworth, Albert Sands, and Josiah Johnson Hawes.

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PAUL, ROBERT WILLIAM (1869–1943)

English inventor and electrical engineer

Born October 3, 1869, at 3 Albion Place, Highbury, North London, and active in Britain's early motion picture industry, Paul had following a technical education and employment with the electrical instrument makers Elliott Bros, Strand, started his own business in 1891, at 44 Hatton Garden. Asked by two Greek entrepeneurs to make copies of the Edison Kinetoscope motion picture peepshow machine, he realised that the design had not been patented in England and started making examples on his own account. Introduced to photographer Birt Acres, their resulting camera for 35mm film provided motion pictures for Paul's kinetoscopes. Subjects taken by Acres in 1895 included The Derby (the oldest surviving English film), Rough Sea at Dover (screened in New York in April 1896), and several comic scenes. After an acrimonious split with Acres, Paul made a successful film projector, the Theatrograph, and a new camera. Films included A Soldier's Courtship, shot on the roof of London's Alhambra Theatre. Paul built a studio and continued producing motion picture machines and films until leaving the changing industry in 1910, to concentrate once again on electrical engineering. He died March 28, 1943, at Twickenham, England.

STEPHEN HERBERT

PEASE, BENJAMIN FRANKLIN (1822–1888)

American engraver, studio owner, and photographer

One of eight children, Benjamin Franklin Pease was born November 17, 1822, in Poughkeepsie, New York, to Dudley Pease, and Sara Rilley. According to the family genealogy, Benjamin was considered an artist as a young adult and by 1846 he was engaged as a wood engraver.

Pease arrived in Lima, Peru, ca. 1852, and a published advertisement states that he purchased a daguerreotype studio at 14 Plateros. Sometime around 1855 he married Peruvian Mercedes Ramírez and together they had eighteen children, though not all the children survived.

He operated successfully for several years at the

Plateros location in Lima during a time the city was experiencing extensive population growth and economic change. This period also brought about more photographic competition. Pease moved his studio sometime around 1859 to a street level location, 182 Plateros, the same building in which Emilio Garreaud had his studio. Historian Keith McElroy, who has complied extensive biographical information on Pease, characterized Pease's daguerreotypes as "straightforward studio portraits... [that] meet high standards, and he served a distinguished clientele, including presidents, intellectuals, and socialites."

In order to compete in the burgeoning photographic community, in addition to his daguerreotypes, Pease began to offer the public ambrotypes, various kinds of hand painted images, and photographs on paper. By all accounts he remained successful. But this success was eventually overshadowed by yet another technological advancement, the carte-de-visite. In the summer of 1856 Benjamin Pease and his family left for Europe. The control of his studio was left to D. David Vargas and D. Fuljencio M. de Urgarte.

Benjamin Franklin Pease returned to Peru ten years later and operated an establishment that made and sold shoes, sewing machines, and other items. He died in Pisco, Peru, in 1888.

MICHELE M. PENHALL

PECK, SAMUEL (active 1840s–1850s)

American inventor and photographer

Samuel Peck was instrumental in the introduction and initial development of the thermoplastic union case in the early 1850s, and thus responsible for the first application of molded plastic to photography.

After spending his early years as a grocer, Peck is listed as an early daguerreotypist operating a studio in New Haven, Connecticut, from the mid 1840s until early 1852, by which time he was also making leather daguerreotype cases, probably in partnership with the Scovill Manufacturing Company. His first patent, issued in April 1850, was for an improved holder for daguerreotype plates during buffing.

Peck's first patent for a thermoplastic composition case (US Patent 11,758) was issued on October 3, 1854, and by the following year, the partnership with Scovill had been formalised into a new company known as Samuel Peck & Co.

Over the following six years, Peck's company, along with rivals A P Critchlow, and Littlefield, Parsons & Co., was highly influential in the popularisation of the thermoplastic case. Peck, however, is believed to have left the company in 1857.

His engagement with photography and case-making was relatively short-lived, and he developed further careers, first as a music-hall proprietor, and then as an undertaker.

He is believed to have died c.1879.

JOHN HANNAVY

PENCIL OF NATURE, THE

Despite its limited initial audience, *The Pencil of Nature* was an epoch-making publication, both technically and aesthetically. Published in six instalments between 1844 and 1846 by William Henry Fox Talbot, it was a luxurious work that constituted the first true photographic book, incorporating in quarto format a total of twenty-four pasted-in original calotype prints (whereas earlier, daguerreotype-based publications had used engraved reproductions), and setting a model for later similar productions by Talbot and others. The subjects ranged from artwork to houseware, scenes in Talbot's Lacock Abbey estate, and English monuments. The prints, of various sizes, were produced at Talbot's Reading Establishment by Nicolaas Henneman and assistants, and pasted in along with a frontispiece, prefatory notes including a "brief historical sketch of the invention of the art," picture titles and lengthy captions in ornate type. The *Pencil of Nature* was sold by subscription, the price of instalments varying with the number of prints (from twenty-one shillings for Part II with seven prints, to seven shillings six pence for three prints in the last parts). Although nearly three hundred copies were produced of the first instalment, interest later dropped and fewer than one hundred were made of the last one. This small printing—a paradox for a book considered to be an ancestor of mass illustration—accounts for the rarity of extant full sets, fortunately supplemented by facsimile editions. Despite its limited circulation, however, the *Pencil of Nature* achieved Talbot's goal of illustrating his invention of a "new art"—an art indeed so novel that Talbot had to warn readers that the plates were produced "by the mere action of Light." It was not only a technical feat, but an ambitious attempt at giving artistic and aesthetic status to the calotype and, more generally, photography. Many of the pictures reflected a heritage of fine arts, and the caption for Plate VI, "The Open Door," explicitly linked its "common" subject—a barn door with tools on either side—to "the Dutch school of art." Thus, the *Pencil of Nature* almost single-handedly created the pictorial tradition in photography. This artistic bend, however, went beyond a generic affiliation with the fine arts, and the caption for Plate VI, as others in the book, should not be read as mere prophecy. More fundamentally, the *Pencil of Nature* enacted an aesthetics and practice of photography that

were strongly rooted in the subjectivity of its author. A number of the pictures illustrated a private (and even aristocratic) realm, which Talbot's texts construed as the antithesis to the universalist, Republican discourse that surrounded photography in France. In the *Pencil of Nature*, photography triggered fancy, as exercised especially in the activities of reading, writing, and more generally playing with signs; it engaged the reader's curiosity as a novel kind of sign itself. Thus fulfilling the concerns voiced in the preface, the *Pencil of Nature* succeeded in establishing—in contrast to the utilitarianism of the daguerreotype—an alternative definition of photography as "pencil of nature," i.e. the playful art of applying the "mere action of Light" to a singular, human creation.

François Brunet

See also: Talbot, William Henry Fox; Calotype and Talbotype; Henneman, Nicolaas; and Daguerreotype.

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PENN, ALBERT THOMAS WATSON (1849–1924)

The son of a family of shoemakers originating in Northamptonshire, Penn was born in Street, Somersetshire on 30 March 1849. Leaving home before the age of twelve, by 1865 he had arrived in Ootacamund, the South Indian hill station in the Nilgiri range west of Madras. During his first decade as a photographer in India, Penn appears to have worked closely with the firm of Nicholas Brothers (later Nicholas and Curths), before establishing his own studio in Ootacamund in 1875. From 1871 Ootacamund had served as the seat of Government for Madras during the hot season and the influx of European visitors to the hills, swelling the resident population, assured the photographer a steady market: for the last quarter of the 19th century, the Penn studio was the most successful photographic business in the Nilgiris, producing a comprehensive record of the town and surrounding hills in work that is often reminiscent of the picturesque style of Samuel Bourne. Penn also made an important documentation of the 1877 famine in South India and an extensive record of the hill tribes of the Nilgiris, in addition to supplying illustrations for a number of published works. He came back to England with his wife in 1911, but returned to South India after the First World War and died at Coonoor in the Nilgiris on 19 October 1924, where he is buried in the Tiger Hill Cemetery.

John Falconer

PENROSE PICTORIAL ANNUAL

From its first issue in 1895 as *The Process Work Year Book* Penrose's Annual, as it was more generally known for nearly a century, provided a review of progress in photo-mechanical and printing work and in its early years offered a unique source of examples of different photo-mechanical printing processes.

It was initially published by A W Penrose & Co which had opened a Photo-Process Stores at Upper Baker Street, London, and was edited by William Gamble (1864–1933) the partner in the firm responsible for the process engraving side of the business. He also edited Penrose's *Process Work*. From 1897 the annual was printed and bound by Lund Humphries of Bradford who in 1909 acquired an interest in the publication when they took over as publishers. Gamble emphasised in 1898 that Penrose saw the annual as more than simply a commercial venture, it was designed to promote photo-mechanical printing more generally.

Gamble had felt the need for an annual review which would give engraving firms the opportunity of showing specimens of their work. In the annual these were pages that were supplied directly by those firms as printing blocks or as printed sheets which enabled the annual to be produced and sold at a price that was significantly lower than its actual costs of production. No payments were made to photographers as the annual considered that an appearance in its pages constituted an introduction to editors and publishers. The specimen pages were supplemented by an editorial surveying progress over the previous year and articles on techniques and materials. In the early years these included many authors from photography such as Bolas, Brothers, Waterhouse, Sanger Shepherd, Chapman Jones and Horsley Hinton. Advertising pages at the rear of the book included catalogues from Penrose and firms from the printing, process and photographic trades. Gamble aimed the annual at 'the editor, publisher, author, artist, photographer, printer, engraver, paper maker, ink maker, binder…'

In 1896 the annual became *The Process Year Book. An Illustrated Review of Photo-Mechanical Processes.*

Penrose's Annual. The next year Gamble in his editorial emphasised that the annual's primary object was the exposition of British work. In 1898 it was subtitled 'a review of the graphic arts' which it retained until its demise and *Penrose's Pictorial Annual* was included on the masthead for the first time. The annual found a ready market and the early volumes quickly sold out. During the early 1900s it further expanded its pagination with more illustrations and articles.

By the 1920s as photo-engraving techniques became static the scope of the annual was expanded to include articles on printing and after Gamble's death in 1933 the new editor Richard B Fishenden further widened the scope to include modern art and experiments in creative colour photography. The annual failed to appear in 1914, 1917–19, 1941–48 and 1963. During its final years, publication was irregular and the last volume, number 74, appeared in 1982.

MICHAEL PRITCHARD

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PERCY, JOHN (1817–1889)

English physician, photographer, and inventor

John Percy was born on March 23, 1817, and studied medicine in Paris and Edinburgh where he qualified as a doctor in 1838. An early enthusiast for photography, he is believed to have first experimented with the medium in 1844, using Talbot's calotype process.

He later studied mineral sciences, was elected a Fellow of the Royal Society in 1847, and took up a teaching post (later Professor of Metallurgy) at the newly opened Government School of Mines and Science Applied to the Arts (now Imperial College) in London's Jermyn Street in 1851. There he was assisted by John Spiller with whom he would subsequently take and exhibit photographs using Archer's collodion process. Their joint work appeared, in the 1857 Photographic Exchange Club album, and the 1857 exhibition of the Photographic Society.

Amongst Professor Percy's many scientific innovations was a means of extracting silver from photographic paper waste.

Surviving images point to him showing an early interest in stereoscopy and the Wheatstone Reflecting Stereoscope, producing images for this instrument contemporaneously with Roger Fenton and others.

In the year of his death, 1889, he was awarded the prestigious Albert Medal for, as the citation read 'his achievements in promoting the Arts, Manufactures and Commerce, though the world wide influence which his researches and writings have had upon the progress of the science and practice of metallurgy.'

JOHN HANNAVY

PERIER, CHARLES-FORTUNAT-PAUL CASIMIR (1812–1897)

French amateur photographer

Charles-Fortunat-Paul Casimir Perier was one of the quintessential "gentleman amateurs" of early photography. The son of Casimir Perier, Prime Minister of France (1831–32), Perier helped manage the family's vast industrial and financial interests, although his avocation was in art collecting and connoisseurship. He acquired important collections of Dutch and Barbizon painting, and his taste for realism extended to the new art of photography. While evidently not a member of the earlier Société héliographique, Perier was a founding member of the Société française de photographie, which he served as vice-president. He photographed with paper and collodion negatives, and participated in the international exhibitions of the 1850s, in which he showed virtually all genre of subject matter, very little of which is known today. His work is rarely discussed in the early literature, perhaps in part because he was himself one of the era's few photography critics, writing lengthy and sensitive reviews in the *Bulletin de la Société française de photographie*. These articles also promoted Perier's own, sometimes polemical views, such as his argument that photography must be accepted as a fine art, albeit of secondary rank. Perier's photographic activity declined in the 1860s, as he turned more interest to writing on the French Salon and art in general.

LAURIE DAHLBERG

PERINI, ANTONIO (1830–1879)

Italian photographer

Fortunato Antonio Perini was born at Treviso in 1830. From the early 1850s he devoted himself to photography and in 1853 he was given official permission to practise as a photographer by the Venetian government. In 1854 he started to collaborate with Carlo Ponti, who collected and sold views of Venice by various photographers. In 1855 Perini showed an album of Venetian views at the Exposition Universelle, Paris and in 1856 he presented a similar album at the Universal Exhibition of Brussels. He took photographs of the solar eclipse on 15th March 1858. On 10th February 1859 he opened a shop

in Venice, next to the San Marco tower. He became very well-known for his professional skill, mainly for his photographs of works of art. In 1862 he won a prize at the International Exhibition in London with an album of 110 albumen prints representing the miniatures of the Grimani Breviary, a famous religious book kept in the Marciana Library in Venice. In 1878 he published his last work, an album of 24 albumen prints of the miniatures of Attavante Fiorentino. In his last days he wrote a letter to his friend Carlo Naya in favour of the proposal by Carlo Brogi of Florence, for a law defending the intellectual and artistic rights of photographers. He died in Treviso on 21st August 1879. His 1872 Vesuvius pictures still survive in the private Italian collection, P. Becchetti collection, Rome, and they are also published.

SILVIA PAOLI

PERMANENCY AND IMPERMANENCY

> Photographs need not, of necessity, fade" wrote Robert Hunt (1857), and "where they do fade, blame rests with the photographer, who has not bestowed the required care in giving them permanence… and if the pictures are toned with gold instead of sulphur, photographs are as permanent as water colour drawings.

That statement was made at a time when the fading of photographs had threatened to undermine the whole future of photography. Far from being the permanent record of nature drawing herself, photographs were becoming seen as being as transient and temporary as the light which originally created them.

The issue of fading was of such widespread significance in the early 1850s, and its causes so little understood, that a letter on the subject appeared in the first issue of the *Journal of the Photographic Society*. The writer, identified only as J.G.M., asked if

> there is any known method by which a positive photograph, prepared only with an ammonio-nitrate of silver solution, may be prevented from fading, or by which it may be revived, having faded; I have one in this latter condition taken about a year ago, and of which the details are certainly becoming obscured, the dark parts being much lighter.
>
> It was done in winter, during rain, and in a much warmer latitude than this.

The assumption that the weather conditions during the taking of the negative might have had some impact on the resulting permanence or impermanence of the print, demonstrates how limited was the average photographer's understanding of the chemistry involved in photographic production.

The editor's recommendation, that a solution of hydrosulphuric acid might restore the image, would have produced only a temporary improvement. Sulphur in the image would, in time, be identified as one of the many factors that contributed to impermanence.

Within two years of this letter appearing in print, the Photographic Society of London, increasingly aware of the mounting scale of the problem, established a committee of photographers and chemists to explore the problem. Their remit was "to take into consideration the Question of the Fading of Positive Photographic Pictures upon paper." The so-called "Fading Committee" chaired by Roger Fenton, was made up of many of the eminent figures of the day, its work funded by a donation from Prince Albert.

While Fenton may have held the chair, the project was led by the eminent chemist T. F. Hardwich. The brief for Hardwich's team had, in effect, been established while the salt print was pre-eminent, but the introduction of the albumen print in the early 1850s had exacerbated the problem. The greater concentration of chemistry within the more impermeable structure of the albumenised surface layer of the print had increased rather than reduced the problems caused by continuing chemical reactions after the processing cycle had been completed. Albumen prints were much harder to wash than salted paper prints, and the chemistry contained within the emulsion more complex. The methodology used by Hardwich to determine the causes and effects—in what was the first scientific study of its kind—established the principles upon which the effects of aging on photographs would be determined for many years. His experimental methodology is still held up as an exemplar.

Almost since the dawn of photography, fading had been recognised as an issue, but not one which appeared to afflict all photographers equally. While Talbot and Henneman had experienced significant fading problems with many of the production runs of prints made by Henneman at the Reading printing establishment in the mid 1840s, prints made by Hill and Adamson in Scotland had not exhibited such difficulties.

There were a number of differences in the manner in which the prints had been made. Henneman had observed that the print colour was 'improved' as the fixing bath aged—due in fact to increased levels of sulphur in the fixer—and thus elected to fix his prints in increasingly old hypo baths. Hill and Adamson, preferring the use of a more dilute, but always fresh, fixer, did not encounter the problem. While Henneman gave limited washing to the completed prints—thus inefficiently removing the complex thiosulphates from the paper thickness—Hill and Adamson washed for up to twenty four hours. While Henneman's shorter wash might have proved reasonably effective in warm weather with warmer water, in winter with cold water it would have

failed to significantly reduce the level of contaminants which would, in time, cause fading. The impact of cold water washing on albumen paper was even greater, with the cold water reducing the permeability of the albumen even further.

The practice of using aged fixers continued until the mid 1850s, recommended by many writers as a means of producing a print colour which was consider more 'pleasing.' It is remarkable that such a deleterious effect was directly as a result of *a positive decision* by photographers.

It was not until 1855 that the importance of fresh fixer and effective washing were widely publicised and understood. The understanding came, in part at least, from the scientific investigations of Alphonse Davanne and Jules Girard, published at about the same time as the 'Fading Committee' in London was undertaking its own exploration.

The most effective solution to the longer term fading of prints came from the combination of efficient fixing and washing, with gold toning, which greatly reduced the effect of sulphur on the image structure. The 'gold bath' became an almost universal stage in print production, but in spite of it, the effects of sulphur in the atmosphere over the past century and a half has bleached the edges of a significant proportion of Victorian prints, both on salt paper and albumen.

While gold toning may have arrested the lightening of the developed tones in an albumen print, no counter was ever discovered for the yellowing of the highlights, caused by the combined effects of light and pollution on complex silver/albumen salts which remained within the paper's image-carrying layer. While intensifiers were produced to 'redevelop' faded images, they could not be used on prints which exhibited this yellowing, as they effectively developed the highlights as well, introducing a buff 'fog' into the highlights.

Questions over image permanency led, in part, to the evolution of printing processes which were not exclusively dependent upon the conversion of silver salts to metallic silver. Carbon, platinum, and pigment processes all resulted in prints which were impervious to the effects of air-borne pollution, and which at the same time expanded the repertoire of the creative printer.

Other permanent printing processes grew out of the quest for methods which would facilitate print production on a truly commercial scale—such as Woodburytype, Autotype, and others—and the introduction of ink-based lithographic and gravure processes.

JOHN HANNAVY

See also: Salted Paper Print; Albumen Print; Printing and Contact Printing and Printing Frames; Carbon Print; Platinum Print; and Woodburytype, Woodburygravure.

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PERSPECTIVE

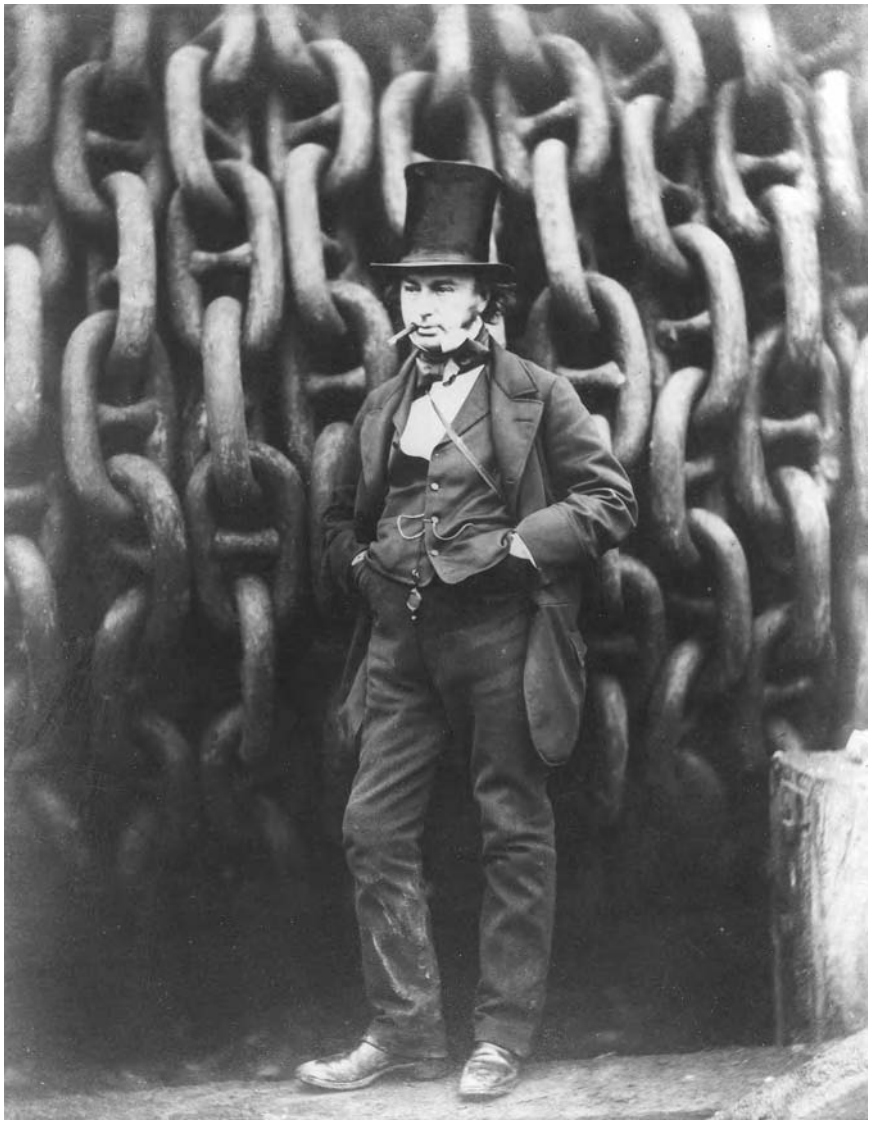
In photography, as in art, there are generally accepted to be two forms of perspective worthy of consideration–linear perspective and aerial perspective. The importance of both was clearly and distinctly understood from the earliest days of the medium.

Linear perspective—sometimes referred to as *isometrical perspective* by nineteenth century practitioners—is the phenomenon by which the spatial aspects of the three dimensional world in which we live are recognized by issues of apparent visible scale. The distance that we perceive in three dimensions is conveyed and visibly recreated in two dimensions by our recognition and understanding of those changes in scale. Thus, an object that appears smaller in a photographic print or a painting is read as being further away from the eye or the camera lens from a similarly sized object that is reproduced larger.

Aerial perspective—the term was coined by Leonardo da Vinci—has, on the other hand, long been understood as the enhancement, or otherwise, of the sense of distance conveyed in a picture by the effect of haze, smoke or water vapor in the air.

While the former implies distance by the convergence of lines towards a notional vanishing point, the latter uses the reduced distinctiveness of objects farther from the lens to imply their distance from the viewer.

The conditions which produced marked aerial perspective were not always seen as being advantageous to the photographer. Especially in the 1850s, when the pursuit of technical excellence was seen to be of greater importance than effect, aerial pollution was seen as a distinct problem, especially in cities where the smoke



Howlett, Robert. Isambard Kingdom Brunel Standing Before the Launch. *The Metropolitan Museum of Art, Gilman Collection, Purchase, Harriette and Noel Levine Gift, 2005 (2005.100.11) Image © The Metropolitan Museum of Art.*

from coal fires combined with moist air to limit the occasions on which the atmosphere was quite clear.

Edinburgh, Scotland, was known as 'Auld Reekie'—literally 'old smokie'—because of the combination of damp air and smoke from fires. Thus, in a lecture to the Photographic Society of Scotland in 1856, the amateur photographer and advocate of le Gray's waxed paper process, Dr Thomas Keith, lamented the persistent effect of aerial perspective on his pictures:

> I am quite satisfied that the commonest cause of failure arises from the paper being exposed in bad or indifferent light, especially in town, where the atmosphere is much adulterated with smoke. I never got a good picture where there was the slightest trace of that blue haze which smoke produces between the camera and the object.

Yet, it is the spatial effect of that aerial perspective which gives many of Keith's pictures their character. The same is true of Roger Fenton's beautiful study *The Terrace and Park, Harewood House*, where, thanks to the haze of a Yorkshire summer, the picture reads as a series of planes, like the layers of a stage set, each lighter and less distinct than the one before it, receding into the distance.

It is, arguably, the impact of moisture in the air that enhanced the effect of aerial perspective in European photographs, and gave the work of European pioneers a quality distinctively different from the work produced in drier climates. In order to assess the likely final appearance of a photograph, photographers were encouraged to consider the scene without color, and thus to assess the tonal impact of aerial perspective. In *The Practice of Photography —A Manual for Students and Amateurs*, 1855, Philip Henry Delamotte suggested:

A black mirror, such as is used by artists, will be found useful in making choice of a view, as, by neutralizing the colours of objects, it more nearly exhibits the resulting photographic effect.

That was, of course, only partly true, due to the

limited color sensitivity of the materials then in use. The black mirror more truthfully exhibited the sort of tonal relationships which would be created on a panchromatic material—something that was still decades in the future. The blue sensitivity of calotype, waxed paper and wet collodion actually exaggerated the impact of aerial perspective, lightening the middle distance and distance more than was apparent to the naked eye, due to the increased blueness of the light which reached the camera from those distances.

In photography, linear perspective is a function of the relationship between the focal length of the lens, and the lens to subject distance. If the lens to subject distance remains constant, then so does perspective even if the focal length of the lens is changed. If, however, a wide-angle lens is used, and the camera is moved closer to the foreground subject, then the relationship changes and a distortion is introduced. That distortion appears to change perspective, and has been an issue which has had to be confronted and addressed ever since lenses were first used as an aid to drawing.

Early illustrators using the camera lucida as an aid to drawing quickly recognized the change in spatial reading, which a short focal length lens gave to them. Such effects are visible in the railway illustrations of John Cooke Bourne in the 1840s, who, for example, would later take up the camera himself as the photographer on the construction of Charles Vignoles' bridge over the Dneiper in Kiev. Users of both the camera lucida and the camera obscura had long understood that unless their instruments were level, a distortion caused by changes in vertical perspective would ensue. Talbot and his circle recognized this problem early on in the history of photography—where the tendency to tilt the camera upwards to include the topes of buildings introduced a horizontal perspective effect which we know today as 'converging verticals.'

In a letter to Talbot in June 1839, quoted in Schaaf (2000), his uncle, William Fox Strangways, offered a criticism of his early photogenic drawings, with the observation:

> I wish you could contrive to mend nature's perspective—we draw objects standing up & she draws them lying down which requires a correction of the eye or mind in looking at the drawings.

Cameras would later be fitted with rising lens panels to correct this distortion, enabling the tops of buildings to be included while keeping the instrument perfectly level. Others asserted that the creation of a true or natural perspective was beyond the capability of the camera. Writing in the *Journal of the Photographic Society* in June 1853, John Leighton believed that the single photograph would always suffer from the fact that "linear perspective [appears] comparatively flat when contrasted with binocular perspective as exemplified in the stereoscope." That comparative flatness was in fact a realistic representation of perspective, not a distortion.

Many artists saw the perspective created by the camera lens as being as being a distortion, an unnatural reading of the subject. Yet, as would later be proved, the camera's perspective was entirely natural—it was the expansion of perspective which was commonplace in paintings which was false. The painter George Frederick Watts (1817–1904) believed that photography "has unfortunately introduced into art a misconception of perspective which is as ugly as it is false," and the American artist Joseph Pennell (1857–1926) was so disillusioned by the perspective created by the camera that he abandoned using photographs as reference.

For much of the second half of the nineteenth century, the lenses used in architectural and landscape photography were of relatively long focal length, requiring quite a substantial camera to subject distance in the case of churches and cathedrals. Such lenses—with a field of view of between 10° and 30°—were essential if large format images were to be created which exhibited the degree of sharpness demanded by early photographers. Until optical manufacturing techniques advanced sufficiently to eliminate spherical aberration, long focal length lenses were the surest way of achieving a perfectly flat image field across the entire plate area. The effect of that was to create a slight compression of perspective—the flatness about which Leighton, Watts, Pennell and others complained. By the end of the century, with wide-angle lenses offering fields of view of between 50° and 80°, photography was able to create the same sort of enhanced perspective so beloved of painters.

KUEI-YING HUANG

See also: Delamotte, Philip Henry; Keith, Thomas; and Talbot, William Henry Fox.

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PERU

In September of 1839, a major Lima newspaper (*El Comercio*), offered its readers news of the new Daguerrean process. Peruvian engagement with photography was not far behind that of more affluent countries (an in some cases it was ahead). In July of 1842, Maximiliano Danti

opened the first photography studio in Peru while Berlin's first studio opened in August of 1842 (McElroy 1977). Photohistorian Keith McElroy notes that photographers active in Peru during the Daguerreotype era (1839–1859) were generally from France or the United States. While the former emphasized "art, current European style and good taste," the latter based their marketing on "speed, prices and technical proficiency" (McElroy 1979a).

Philogone Daviette was the second known daguerreotypist in Lima (1844) and possibly the first in Perú to offer postmortems. Jacinto Pedeville (Pedevilla) arrived in 1846 and is credited (along with Felix Salazar) with introducing albumen prints in Peru in 1853. Early North American daguerreotypists include J. M. Newland (also known as Juan Newman), active in Lima and Callao (1846) and Arequipa (1847), and Arthur Terry who managed a Lima studio between 1848 and 1852. After moving to Chile, Terry was in partnership with Cipriano Clavijo who was later active in Arequipa and Trujillo between 1860 and 1892.

The first known native-born Peruvian photographer Juan Fuentes was active in Lima beginning in 1856. His idea to photograph convicted criminals as an innovative record keeping device was eventually funded by the government. Other Peruvian-born photographers from that era include Felix Salazar who worked in Lima between 1854 and 1887. Salazar was in a succession of partnerships with other photographers (Richardson, Bouvier, Remorino, and P. E. Garreaud). Salazar also produced views of the Arequipa Revolution of 1867 and the great Arequipa Earthquake of 1868.

North American Benjamin Pease arrived in Peru in 1852 and bought the studio of compatriot Arthur Terry. According to McElroy, Pease "produced the most significant body of daguerrean plates and built the first of the grand [photography] salons in Lima" (1979b). Later, Pease successfully transitioned into the cdv era. In 1870 Pease took a series of photographs of the Mollendo to Arequipa railroad line whose construction was supervised by the noted engineer Henry Meiggs. Other arrivals from the United States included Henry de Witt Moulton (who had worked at the famed Gurney and Fredricks studio in New York) and Villroy L. Richardson. Both men had been contracted to work at the Pease studio. Later, they were both affiliated for a time with the studio of Pedro Emilio Garreaud.

Villroy Richardson opened his own studio in Lima in 1862. Richardson's well executed cdvs were much in demand as were his images of the Lima to La Oroya railroad line. In the 1860s he produced photomontages, placing political personalities on the bodies of animals and later produced a series of popular political caricatures on cdvs. When he did not heed government warnings to cease, Richardson was arrested and released only after his political favorite became President. Henry Moulton's negatives of Lima and most significantly, the Chincha islands (where fortunes in guano were harvested), were made into prints by U.S. photographer Alexander Gardner. The images appeared in *Rays of Sunlight in South America* (c.1865).

Ricardo Castillo first worked for the Richardson studio. In the late 1890s, Castillo operated the latter's studio in association with Ignacio Lecca, and later managed his own studio. Castillo produced carbon prints, photographed the mining area of Cerro de Pasco and documented portions of the destruction resulting from the War of the Pacific between Peru/Bolivia and Chile (1879–1884). Eugenio Maunoury opened his elegant studio in 1861 and is credited with popularizing the *carte-de-visite* in Peru. Manoury along with José Negretti and the major Lima studios had great success marketing cdvs of *tapadas* (women posing in *mantos* (shawls) and *sayas* (skirts) once worn by Limeñas during the colonial period and which signified flirtation). Maunoury's affiliation with Nadar in Paris was noted on his cdvs and the logo was later used by the famed Courret studio when it acquired Manoury's three studios in 1865.

The Courret brothers studio established in 1863, merits special attention due to "The quantity, quality and duration of its production" (McElroy, 1977). Eugenio operated the camera while Aquiles took care of the business details. In the 1870s, the latter left Peru and Eugenio managed the studio until around 1892 when he returned to France. The elegant Courret studio produced thousands of cdvs and cabinet cards, outdoor scenes of various cities (Lima, Callao) events (earthquake of Arica and Arequipa, Industrial exposition of 1869); and of the Oroya railroad line. According to McElroy, "It would be impossible to illustrate a history of Peru in the second half of the 19th century without including Courret portraits" (McElroy 1977). The Courret studio was transferred to Adolfo Dubreuil and a series of successors. Portions of the Courret Archive have been preserved.

Photographers in the provinces were able to maintain successful studios in various cities, especially in Arequipa which for a time prospered due to a large demand for alpaca wool. Ricardo Villalba (also spelled Villaalba) owned a studio in Arequipa during the 1870s. He produced cdvs, remarkable photographs of the Mollendo to Puno railroad line and views of Lake Titicaca. Felix Renaut, active in Arequipa between 1868 and 1874, produced cdvs and stereoviews. Miguel and Luis Alviña whose familial relationship if any, is not known, both worked in Arequipa in the 1860s. Luis also worked in Cusco in the 1870s and participated in an expedition to Paucartambo in 1873. Some of his albumen prints of that region's people have survived.

Carlos Heldt worked in Trujillo, Lambayeque and Arequipa between 1870 and 1890. Juan Manuel Anda was active in Tacna and other southern Peruvian locations between 1878 and 1910, where he specialized in studio photography. Toward the end of the 19th century, Charles Kroehle produced notable photographs of the Amazon region and its people, some of which were published in Miles Moss's book *A Trip into the Interior of Perú (1909)*. Kroehle's photos of Lima and its environs were published in A*lbum de Lima y sus Alrededores* (1900).

Frenchman Emilio Colpaert photographed various areas of Peru between 1859 and 1862 focusing primarily on ethnographic and archeological subjects. He also owned one of the first studios in Cusco (1862). His compatriot Pablo Emilio Garreaud opened a studio in Lima in 1856 with T. Amic Gazan. In 1862 Garreaud traveled to various locations in Peru, photographing views of and people in Cusco, Arequipa and the Altiplano. These were used to illustrate a major work, *El Atlas Geográfico del Perú* (1865). Pablo Emilio was the father of Fernando Garreaud who between 1898 and 1899 traveled throughout Perú documenting various regions for a national documentation project published as *Peru 1900*.

Late 19th century studio owners who enjoyed success into the 20th century include Rafael Colmenares active in Ayacucho, Lima, and Callao; Miguel Chani in Cusco; and Emilio Díaz and Max T. Vargas in Arequipa. Manuel Moral was active in Lima between 1884–1896, after which he sold his studio and went on to publish some of Peru's most important illustrated periodicals including *Prisma, Variedades* and *Ilustración Peruana*.

Climate, indifference and lack of resources have contributed to the loss of portions of the Peruvian photographic patrimony. Private collectors and some institutions can be credited with preserving important portions of this heritage. The history of Peruvian photography received its first major attention in the work of Keith McElroy who in 1977 conducted an in-depth study of 19th century Peruvian photography. In his study McElroy identified over 140 photographers. Since that time the number of articles, exhibitions and books on the subject has grown significantly. The latest and most comprehensive project was the exhibition held at the Museo de Arte in Lima and the Fundación Telefónica in Lima (2001–2002). The two volume catalog of the exhibition includes a detailed essay on the history of Peruvian photography, photographs showing the range and quality of Peruvian photography since its beginnings, and a directory of over 500 photographers active in Peru between 1842 and 1942.

YOLANDA RETTER

See also: Carte-de-Visite; Negretti and Zambra; and Villalba, Ricardo.

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PERUTZ, OTTO (1847–1922)

Otto Perutz was born on July 27, 1847, in Teplitz-Schoenau (Teplice, Czechia) to a family of industrial manufacturers, mostly in the textile industry. Little is known about his formal training, the first record being his installation as managing director at the Bayerische Aktiengesellschaft fuer chemische und landwirtschaftlich-chemische Fabrikate (BAG) at Heufeld near Munich which had been founded in 1857 under the supervision of the German chemist Justus von Liebig. The BAG worked on agrochemical substances and had no relation to photography. On April 13, 1880, Perutz bought the Chemische und pharmaceutische Produktenhandlung Dr. F. Schnitter & Co. in Munich, a merchant in photochemical substances necessary for wet plate processes. In 1882, Perutz came into contact to Johann Baptist Obernetter who had worked as a chemical assistant to Joseph Albert and his printing house and was licensed by Hermann Wilhelm Vogel to produce dry plates after his method of sensitisation with Eosin (orthochromatic plates). Introduced in August 1887, the Perutz plates were an instant success due to their rapidity and extended spectral sensitivity. The company grew quickly and concentrated on a number of different products: From 1893 it produced large format glass plates for the use in stained windows as in church houses, villas, or official buildings; these large format positives were developed and monochromically tinted in the company. From 1896, Perutz was the first company to produce glass plates for the Roentgen process of X-ray photography.

On July 1, 1897, Otto Perutz sold his enterprise to the Engelhorn family, then owners of large chemical companies like Boehringer (Ingelheim) and BASF (Ludwigshafen). He returned to the BAG where he became member of the board of trustees in 1902, a position he held until his death on January18, 1922. The managing director of the new Perutz company was Franz Mayerhofer, a modernist in many aspects. For the time of his direction, until 1922, Perutz had the most modern advertising, marketing, and product range of all German film and plate companies. In 1900 and 1902, two plates

which extended spectral sensitivity were launched which had been created in collaboration with Adolf Miethe, the successor of H.W.Vogel in Berlin, and Arthur Traube, then assistant to Miethe. From 1904 to 1910, Traube constantly worked with Perutz and developped a number of colour sensitive plates, preparing his own colour photography inventions which he was to market in his own company Uvachrome from 1910 onwards. Under the direction of Curt Engelhorn, from 1924 to 1938, Perutz managed to stay away from being swallowed by the I.G.Farben concentration, and survived as an independent film producing company until its integration to the Agfa-Gevaert holding in 1964.

ROLF SACHSSE

PETIT, PIERRE (1832–1909)

French photographer and studio owner

Pierre Petit practiced daguerreotype beginning in 1849 and was trained as photographer in Disdéri's studio. In 1858, he left to join Trinquart, with whom he opened the "Photographie des Deux mondes" the following year at 31, Cadet place, not far from the boulevard. In 1860, they opened a branch in and then, in 1861, they opened another in Marseilles. In 1859, Petit started to work with the immense project *Galerie des hommes du jour, portraits photographiés* (*Gallery of portraits of men of the moment*), headed by the critic Theodore Pelloquet, which had appeared in installments since 1861. These portraits were taken on whole plates and printed, which was then placed on Bristol-board paperboard. Accompanying each portrait was a biographical note about the person in the image. The professional singer Pauline Viardot, the journalist Alphonse Karr, the painter Eugene Delacroix, and many others appeared in this gallery. At the same time, Petit undertook a series of portraits of bishops, for which he received, in 1862, the title of "photographe de l'épiscopat français" (photographer of the French episcopate). He created a total of 25,000 portraits of ecclesiastics. He was also interested in the techniques of mechanical reproduction so much so that Poitevin granted the right to him to use his process, which guaranteed the better conservation of portraits.

Similar to his activity as a portraitist, Petit documented the Expositions Universalle. In 1855, he was part of the "Société du Palais de l'industrie" (Company of the Palace of Industry), which was set up by Disdéri, and was responsible for reproducing the various sections of the exposition. In 1867, he received along with the young assistant Bisson, an imperial commission for the exclusive control of reproduction of the overall pictures. Leon and Lévy were responsible for the stereoscopic views and Michelez for the reproductions of works of art. Petit worked in a private house built on the exhibition site. In 1875, he reproduced the collections of the Musée Dupuytren, totaling 85 plates. In 1878, he again photographed the Exposition(s) Universelle. He also made a report to the head office of Paris in 1870–1871 during the Franco-Prussian war and another on the construction of the Statue of Liberty in New York, between 1871 and 1886.

Petit worked with the Société française de photographie in 1875, but only took part in three of its exhibitions, 1859, 1861 (with Trinquart), and 1863, each time from various framed images. He presented portraits primarily, but also group portraits, studies of animals, an image of the Champs-Elysées, and reproductions of Roman frescos. His portraits were noted by critics, who regarded them as the best of their kind, even by the prestigious Francis Wey. The *Galerie des hommes du jour* was qualified on several occasions as "monumental."

Pierre Petit was appreciated by the critics and by the public for the direct aspect of his portraits which were simple on neutral background, and without decoration. Critics also praised his images for their natural poses, the frankness of the images, his skill to seize the character of the model while playing with the various shades of light, and for his irreproachable execution. Ernest Lacan was one of most laudatory in this respect, evoking the striking resemblance of his portraits: "He did not only reproduce the features of his models, he reproduced their true facial appearance" (*La Lumière*, August 13, 1859). Familiar with the parallels with painting, the critic compared the strength of the tone and the boldness of the parties captured in Petit's portraits to the works of the great Spanish painters. Ernest Lacan also compared him with Nadar, his principal competitor as portraitist on the Parisian scene. Francis Wey greeted the way in which he managed to release all the energy and the grandeur of the model and the critic Ladimir greeted his artistic feeling, his manual dexterity, and his capacity to represent intimate thoughts (*Le Pays*, June 24, 1861). More than the portraits of celebrities are his figures of children.

In 1862, Petit published the *Simples conseils ; manuel indispensable aux gens du monde* (*Simple councils; essential handbook with the society peoples*), a small work with a misleading title that moved away from the technical handbooks that were published then. This contained texts written on him by various critics as well as caricatures made of him which testify to his notoriety as a great part of his portraits were drawn from the calling card format which allowed a broad diffusion of them. To attract customers, Petit used the advertising space affixed to the buildings of his district, that announced his establishment to the passersby. One can see one of them on the street Laffitte by Charles Marville. A sign of his success was the expansion of his establishment on the rue Cadet in 1876. On this occa-

sion, Ernest Lacan described it like "a true museum," with a gallery lit by transparent photographs on glass, like stained glass (*Moniteur de la photographie*, November 16, 1876).

Even if he illustrated in other genres, Pierre Petit remains particularly well-known as a portraitist. His career, like those of Disdéri or Nadar, is a perfect illustration of the popularity of the photographic portrait and of the prosperity that of some large professional workshops knew, as true "temples of photography."

HELENE BOCARD

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PETZVAL, JOSEF MAXIMILIAN (1807–1891)

Josef Petzval is widely recognized as the father of photographic optics, being the first person to apply mathematical computation to the design of a photographic lens.

Born in Spisská Belá—then in the Austro-Hungarian Empire but today in Slovakia—he studied physics and later mathematics in the Institutum Geometricum in Budapest, now part of Budapest University.

After graduation, with a doctorate in physics, he lectured part time at the Institutum, while also working as an engineer in Prague. In 1838, he moved to Vienna and took up the position of Professor of Mathematics at the University of Vienna, where he spent the next forty years. In the following year, he designed the rapid portrait lens which bore his name and which revolutionized photography.

His interest in photographic lenses is believed to have been triggered by a discussion with his friend and colleague Andreas von Ettinghausen, after the latter had returned from Paris where he had seen the daguerreotype demonstrated. Ettinghausen lamented the fact that exposures with the new process were too long to make portraiture a practical proposition, and Petzval embarked on research to see if the design of lenses could be improved to reduce exposures.

The result, computed before the end of 1839, and produced in prototype by early 1840, was an innovative design using two pairs of achromatic lenses that reduced exposure times by more than 95%. Daguerre's original camera used a lens with an effective aperture of f/16, while Petzval's alternative offered a fixed aperture of f/3.6.

Descriptions of the portrait lens, in early manuals, attest to its reliability and popularity. In the 1860s, William Lake Price described it as:

> A front crown lens of unequal convex curves, to which are cemented a double flint lens of unequal concave curves; the back combination is a crown lens of unequal convex curves and a concavo–convex flint lens at a little distance from it. For more than a quarter of a century this lens, without further changes in its construction than modification of its curves, has been ised not only for the class of pictures its name denotes but for a variety of others.

Petzval's design used two pairs of color-corrected lens glasses, their negative elements facing towards the centre, on either side of a large central space. It was the creation of the space between the pairs that achieved the desired result. That result was a combination which offered significant correction of chromatic aberration and coma, but like all such designs, suffered significantly from spherical aberration.

The design did not create a flat image field, and while this was not a major issue when used to make small daguerreotype portraits, it had severe limitations when it came to larger plate sizes, as definition and sharpness fell off significantly towards the edges of the plate. Given the small sizes of daguerreotype plates popularly used at the time, and the fact that enlargement of the photographic image was still decades in the future, the loss of edge definition was not immediately seen as a problem. A variation on the design later partially eliminated the problem, and allowed the lens to be used for architecture and landscape. It was, however, the portrait lens which achieved greatest significance in the evolution of photography and, accompanied by the considerably increased sensitivity of the daguerreotype plate which resulted from the chemical innovations of John Frederick Goddard, made portrait photography a practical proposition. Between them, these two men and their ingenuity effectively reduced exposure times from many minutes to just a few seconds.

Being of limited means, Petzval could only afford to patent his design within the Austro-Hungarian Empire, and agreed, for a single payment, to license the manufacture to Peter Wilhelm von Voigtländer, who produced the first commercially available lenses in 1840. One of the first cameras to be sold with the Petzval lens attached was Voigtländer's unique metal-bodied daguerreotype camera of 1841. About six hundred examples of this camera are believed to have been manufactured, but very few are known to have survived.

Petzval's relationship with Voigtländer deteriorated from 1845 when Petzval saw the success of the lens and realized that, apart from his original payment, he would not benefit from it. When Voigtländer subsequently moved his manufacturing facility from Austria to Germany, and outside the scope of Petzval's patent,

their dispute continued for many years. Voigtländer, however, went on to refine and develop the design, and his 'Orthoskop' lens—a direct derivative of the original design—achieved widespread success as a landscape lens.

Recognizing the shortcomings of the original lens, Petzval applied his mathematical skills to resolving the problems of spherical aberration, and in so doing, evolved a mathematical calculation to measure and predict the flatness of the resulting image field. The 'Petzval Condition' or 'Petzval Sum,' derived in 1843, became the standard method for quantifying this problem and resolving its effect. It is still in use today.

Petzval is also credited with the design of opera glasses, and therefore with contributions to the evolution of binoculars. He also proposed mirror reflectors for light bulbs, to gather and reflect a higher proportion of the available illumination, and made significant contributions to the worlds of mathematics, acoustics and physics.

However, a break-in at his house in Vienna in 1859 resulted in the loss of many of his manuscripts—several of them unpublished—and resulted in him abandoning his plans to publish definitive books on the subject of optics.

He retired from scientific pursuits in 1877, and died in Vienna in 1891.

CARYN NEUMANN

Biography

Born in Spisská Belá–then in the Austro-Hungarian Empire but today in Slovakia—Josef Petzval was one of six children. His father was a teacher and musician. Josef studied physics and later mathematics in the Institutum Geometricum in Budapest, now part of Budapest University, and after graduation, with a doctorate in physics, lectured part time at the Institutum, while also working as an engineer in Prague. In 1838, he took up the position of Professor of Mathematics in Vienna, where he spent the rest of his professional career, retiring in 1877.

An intensely private man, relatively little is known of his private life, and even his biographer Ludwig Ermenyi could offer little information. He is known to have married late in life—in 1869 at the age of 62—but was divorced four years later. In 1877 he moved to Kahlenberg of the outskirts of Vienna where he became a virtual recluse and died in 1891, largely forgotten and almost penniless. History, however, has not forgotten him.

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PHILADELPHIA PHOTOGRAPHER

Under the editorship of Edward L. Wilson, *The Philadelphia Photographer* was established in 1864 with the sponsorship of the Philadelphia Photographic Society. Wilson had left business a year previous to work with the Philadelphia photographer Frederick Gutekunst. The journal was published twice-monthly, and distinguished itself from the New York journals by including a tipped-in photograph, varying from views, portraits and copies of engravings, in each issue. The journal included one of Edward Muybridge's views of Yosemite in 1869. In contrast to the more scientific concerns of *The American Journal of Photography* and *Humphrey's*, Wilson saw the *Philadelphia Photographer* as serving a more general readership, including the "novice, experienced artist or amateur." "No centre table is without its album, and no parlor wall entirely bare of photographs. Yet how few know how they are made; how to get the best or where; which are the best kinds; or how to sit and what to wear," Wilson wrote in the first issue. After 1869, *The Philadelphia Photographer* was the remaining independent photography journal and the most influential journal in the field in the last decades of the 19th century.

Writers for the journal included Matthew Carey Lea, chemist and scion of the Philadelphia publishing family, who reported on and evaluated photographic chemistry and wrote summaries of his reading of the British and European photographic journals. In 1864 and 1865, Coleman Sellers wrote a series "Letters to an Engineer, On Photography as Applied to His Profession" that traced the connection between industry and photography; he also profiled Dr. Thomas Kirkbride's use of the Lagenheim brothers' magic lantern slides displays at the Philadelphia Hospital for the Insane. Hermann Vogel regularly wrote a "German Correspondence" column for the journal and reported on photographic events in Europe beginning in 1865; during the 1870s, John Towler, former editor of *Humphrey's*, wrote a regular column as well.

Technological and chemical reporting in the journal ranges from wet and dry plates to discussions of magic lantern slides, stereographs in the 1860s and 1870s. In the 1860s, the journal published articles titled "Photography as a Moral Agent" and "Photography and Truth." Wilson and his writers weighed in on discussions of artistic view photograph in the 1870s, promoting the artistic visions of photographers and their medium, recommending in 1871 that Henry Peach Robinson's *Pictorial Effect in Photography* was the standard-bearer in photographic literature. In the 1880s the journal gave

regular coverage to the burgeoning amateur movement and camera club outings as well as discussed half-tone printing, highlighting the tensions that remained at the end of the decade between artistic and scientific interests in photography.

Wilson also published *The Magic Lantern* (1874–1885) and the annual digest *Photographic Mosaics*. He also wrote and published a number of books, *The Philadelphia Photographer* absorbed *Photographic World* in January 1873 and *Photographer's Friend* in 1875. The journal was continued as *Wilson's Photographic Magazine* and published monthly in New York from 1889–1914.

Alongside the technological information profiled in its pages, social and cultural historians have looked to the journal to trace attitudes toward and responses to 19th-century photography, among them Sara Greenough, Peter Bacon Hales, Mary Panzer, Barbara McCandless, and Alan Trachtenberg.

ANDREA L. VOLPE

See also: Wilson, Edward Livingston; Lea, Matthew Carey; and Robinson, Henry Peach.

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PHILOSOPHICAL INSTRUMENTS

The term "philosophical instrument," despite being in popular use, was never clearly defined but was in general use during the eighteenth century through to the mid-nineteenth century. From the 1850s the term gradually fell out of favour and was not replaced. Philosophical instruments were generally used to explore and demonstrate in either an academic or popular way the basic principles of natural philosophy, or science.

Scientific instruments played an increasing role in scholarly study and working life from the middle ages. Accurate measurement and calculation was essential for navigation, manufacturing and construction, and trade and commerce and through the sixteenth and seventeenth centuries this need lead to the development and refinement of instruments such as back-staff, octant and sextant for navigation; compasses, levels and theodolites for surveying; and scales, weights and rules for commerce. These were developed out of practical need and represented the everyday trade of instrument makers.

From the mid-seventeenth century experimentalism had superseded theories about the natural world based on Greek thought and grand hypotheses. Francis Bacon had shown that experimentation, observation and careful records could be used to make scientific deductions and this new methodology was taken up by the Royal Society in London. The major centres of scientific learning in Europe began teaching experimental philosophy using practical apparatus. Popular demonstrations and lectures rapidly spread across Europe and America. Their effect was to stimulate the demand for the commercial manufacture of philosophical instruments for demonstration and teaching purposes. The basic design of most instruments varied little into the twentieth century.

Although many of the instruments were used for demonstration and teaching purposes many, such as telescope and other optical devices also had a practical aspect to them and were sold by instrument makers to a wider public and for practical commercial and business use. During the later eighteenth and early nineteenth century, many makers described themselves as 'optical and philosophical instrument makers' rather than mathematical instrument makers, chemical manufacturers or specialised makers of, for example, spectacles or scales. A number of firms associated with early photography used this description of their business. Philosophical instruments were produced in a range of qualities as, for example, simple brass 'student' microscopes through to elaborately-decorated gilt and silver finished microscopes for use by royalty, confirming their dual use as instruments for scholarly use and as home entertainment.

Although the definition varied slightly philosophical instruments were originally understood to demonstrate mechanics, magnetism, pneumatics, hydrostatics and hydraulics, electricity, heat, sound and light. Meteorological instruments were also included.

Mechanical models were used to demonstrate various mechanical effects including gravity, forces, inertia, momentum, inertia and levers and pulleys. Steam models were produced from the early nineteenth century of different types of engine and engineering tools such as cranes and mills.

Magnetism and the compass were essential for safe

navigation and natural magnets or lodestones were used to demonstrate the power of magnetism.

Pneumatics, the study of air and gases, and especially the creation of a vacuum led to the development of air pumps from the late seventeenth century.

Hydrostatics. This was the name given to apparatus used for demonstrating all effects involving water. This ranged from model diving bells that made use of pressure to move a model up and down a water-filled cylinder, to the Tantalus cup demonstrating the siphon, to elaborate fountains and the use of water under pressure. Instruments such as the hydrometer were developed to measure specific gravity.

Electricity was studied extensively during the eighteenth and nineteenth centuries and machines were developed to produce electricity and then to store it. Static electricity was studied and machines produced in the later eighteenth century culminating the Winshurst machine that used two counter-rotating glass disks to generate static electricity to produce an electric spark. Many electric devices were used as forms of popular entertainment. Geissler tubes were glass tubes containing a high vacuum which contained gases that glowed when electricity was passed through them. The discovery of electric current lead to the development of measuring instruments such as the electrometer and galvanometer and storage methods such as the Leyden jar.

Heat—apparatus was developed to show that some materials expand and contract under heat, that mirrors could be used to focus heat and the nature of heat as an energy form which lead to the development of Crooke's radiometer.

Sound demonstrations in the eighteenth century were limited with the principal experiment showing that a noise disappeared in a vacuum. In the nineteenth century work into tuning forks and resonance lead to the development of the telephone and phonograph.

Meteorological instruments. The refinement of the principal meteorological instruments occurred during the eighteenth century with the thermometer to measure temperature; the hygrometer to demonstrate humidity in the air; and barometer to measure air pressure.

Light—which had most relevance to photography—was studied through apparatus designed to demonstrate and make use of scientific discoveries. Early studies traced light through different media such as water, the use of mirrors and light through lenses and prisms. Microscopes and telescopes made use of the development of advances in lens design and the understanding of refraction and reflection of light. Mirrors appeared as Claude Lorraine glasses for drawing, and in different forms to view anamorphic drawings. The camera obscura made use of lenses, mirrors and the camera lucida used a prism, to aid drawing. The zograscope, stereoscope, magic lantern and kaleidoscope all derive from optical study.

Allied to this was the study of the eye and how it worked with the brain. The demonstration of persistence of vision was shown through the thaumatrope, phenakistiscope, zoetrope and praxinoscope.

Other areas of optical study also developed instruments such as the polariscope and polarimeter which made use of the discovery of polarisation. The spectroscope allowed chemical composition to be determined through the study of emitted light. According to Turner the spectroscope 'contributed more to modern science than any other instrument'.

The development of instruments to study and demonstrate scientific principals lead to a rapid increase in scientific knowledge during the nineteenth century and a growth of scientific instrument makers who produced the standard demonstration instruments as well as their own variants and entertainments based on scientific principles. In 1701 there were 151 instrument maker's working in the British Isles which had increased to 837 by 1851. It was from the group of 'optical and philosophical instrument makers' that the first photographic retailers and specialised photographic manufacturers emerged in the early 1840s and 1850s.

MICHAEL PRITCHARD

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PHILOSOPHICAL MAGAZINE

Using the relatively new printing technology of stereotyping, the *Philosophical Magazine* was launched in 1798 by Alexander Tilloch (1759–1825):

> the grand Object of it is to diffuse Philosophical Knowledge among every Class of Society, and to give the Public as early an Account as possible of every thing new or curious in the scientific World, both at Home and on the Continent. ('Preface,' *Philosophical Magazine,* 1, 1798)

Initially, the journal was in competition with another recently-founded periodical, William Nicholson's *Journal of Natural Philosophy, Chemistry and the*

Arts, but the *Philosophical Magazine* absorbed this in 1813. In 1822, Tilloch took the printer Richard Taylor (1781–1858) into partnership as both editor and co-proprietor in the face of increasing commercial competition. This move proved successful, and after Tilloch's death in 1825, leaving Taylor sole owner and editor, the *Philosophical Magazine* (known throughout its many permutations affectionately as '*Phil. Mag.*') managed to absorb Thomas Thomson's *Annals of Philosophy* in 1826 (when its editor Richard Phillips became co-editor) and David Brewster's *Edinburgh Journal of Science* in 1832, when Brewster became the third editor of the amalgamated *London and Edinburgh Philosophical Magazine and Journal*. A Dublin editorship was created when the eminent chemist Robert Kane (1809–90) was invited onto the editorial board in October 1840.

As W.H. Brock and A.J. Meadows have written:

> one estimate suggests that 64 per cent of all nineteenth-century scientific periodicals were commercially published rather than issued as the official journals of learned societies. Such journals served an important number of functions. They speeded up publications at times when the proceedings of scientific societies appeared intermittently or only once or twice a year … Such journals also provided intelligence of science in foreign journals for those who read no foreign languages or who had no access to large libraries. They also aired controversies or allowed space to issues involved in new research programmes; they accepted for publication the minor and even trivial research with which learned societies could not be bothered, thereby continuing to cater for the popular and cultural (and often provincial) images of science during a time when it was undergoing the rigor of specialisation. On the other hand, such journals often accepted for publication original findings or theoretical speculations that were considered unorthodox by the societies. In this respect they kept the scientific societies on their toes, broke their monopolies, and made them less authoritarian and cliquish than they might have been. (Brock and Meadows 1984, 93)

Before the specialist photographic journals became established, the *Philosophical Magazine* provided a ready forum for early papers discussing the emergence of the new science. For instance, one of those of the pioneer photographer, W.H.F. Talbot, read before the Royal Society but then not submitted to its prestigious journal, the *Philosophical Transactions,* appeared in the *Philosophical Magazine* in early 1839. Other important papers relating to photography in 1839 included ones by Sir John Herschel and John Towson; subsequently in 1840, John William Draper discussed daguerreotype portraits, and Antoine Claudet published his method of speeded-up daguerreotype development there in August 1841, having discovered it in May. Herschel published a variation of a paper published earlier in the *Philosophical Transactions* in February 1843, while George S. Cundell wrote about the calotype in May 1844, and in December that year, George Shaw and Dr Percy published 'On some photographic phaenomena' (Gernsheim 1984, 137–9). However, as the nineteenth century progressed, the *Philosophical Magazine* became increasingly specialized, and by the last quarter of the century it had become almost entirely a journal composed of physics articles.

A.D. Morrison-Low

See also: Brewster, Sir David; Claudet, Antoine-François-Jean; Herschel, Sir John Frederick William; Talbot, William Henry Fox; Royal Society, London; Philosophical Transactions; Calotype and Talbotype; Daguerreotype; Science; Cundell, George Smith and Brothers; Draper, John William; Shaw, George.

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PHILOSOPHICAL TRANSACTIONS

The Royal Society of London is deemed to have been founded at an informal meeting at Gresham College in the City of London on 28 November 1660, shortly after the restoration of the Stuart monarchy in the person of the king, Charles II. 'On 15 July 1662', wrote Marie Boas Hall:

> a formal Charter of Incorporation was enacted for 'the Royal Society', while in April 1663 a second charter denominated it 'Regalis Societas Londini pro Scientia naturali promovenda', the Royal Society of London 'for improving naturall Knowledge'. It is thus the oldest continuous scientific society in the world still operating under its original charter, and its principal publication, the *Philosophical Transactions*, is the oldest continuous scientific journal. (Hall, 1984, ix.)

The *Philosophical Transactions of the Royal Society of London* first appeared in 1665, with beginnings that upon closer scrutiny were turbulent but ground-

breaking; however, by the early nineteenth century, the Society was beginning to reform itself. Under the forty-two year presidency of Sir Joseph Banks it had epitomised the gentlemen's club leisurely investigating a wide range of curiosities; after his death in 1822, it began to transform itself into a rigorous and disciplined body pursuing the increasingly professionalized sciences, across social boundaries. The twice-annually published *Philosophical Transactions* followed this self-reforming trend, and as the main publication of what was effectively the nation's independent academy of science, was treated with considerable respect.

Only a handful of important scientific papers relating to the emergence of photography were published in the *Philosophical Transactions*, all within the first decade of photography's genesis. This apparent paucity can be explained by the comparative rapidity with which other commercially-produced periodicals, such as the *Philosophical Magazine*, could produce a publication. Also, the emergence of journals dedicated exclusively to photography in the early 1850s meant that the writers, assured of an interested audience, in due course went elsewhere. But amongst the important papers which appeared in the *Philosophical Transactions*, the pre-eminent scientific journal of the English-speaking world, were several by Sir John Herschel (FRS from 1813), one of which was awarded the Royal Society's Royal Medal; this was published in 1840 and in it he divided photography into positive and negative images for the first time, mentioned his experiments with photography on glass, the use of hyposulphite for fixing, and the necessity for achromatic lenses for correct delineation. An earlier paper, read before the Society in March 1839, was mislaid until recently. Other significant photographic papers were published in the *Philosophical Transactions* by Robert Hunt and Antoine Claudet; two papers about the application of photography to recording instruments were placed there by Sir Charles Brooke and Sir Francis Ronalds.

A.D. Morrison-Low

See also: Claudet, Antoine-François-Jean; Herschel, Sir John Frederick William; Hunt, Robert; Talbot, William Henry Fox; Royal Society, London; and Philosophical Magazine.

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PHILPOT, JOHN BRAMPTON (1812–1878)

English photographer

Born in England, John Brampton Philpot resided in Florence from about 1850 until his death in 1878. In 1856 Philpot made thirty calotypes which record the sculpted figures of the Tuscan "pantheon" in the exterior niches of the Uffizi. A series of 28 calotypes of Florence date from the same period, for four of these were exhibited in 1856 at the Photographic Society of Scotland in Edinburgh. Also in the 1850s Philpot produced facsimiles of drawings in the Uffizi in connection with a proposal to compile an inventory of the collection. Baedeker mentioned this aspect of Philpot's production in his 1877 Handbook for Northern Italy, listing Philpot's business as one of the principal photographic establishments in Florence: "Philpot & Co., Borgo Ognissanti 17 (reproductions of Uffizi drawings)."

Graham Smith

PHOTO-CLUB DE PARIS

In the 1880s, photographic technique and practice evolved, it became easier to take pictures, thanks to the introduction of the Gelatino-bromide process. This invention permitted an industrialization of photography. Lots of people bought a camera and photographed—for most of all—their family life and their entertainments.

Likewise, the institution had to follow this fundamental change. Scientific members of photographic societies and long time users tried to make recognize photography not only as a leisure but as a new subject of research.

Following the techniques simplification, a new type of amateurs emerged. Born for almost all of them during the 1850s, they were not particularly involved in chemistry. Along with it, a new kind of gathering, the Photo-Club de Paris created in 1888 after an article in the newspaper "L'Amateur photographe," was entirely dedicated to the amateurs, and not only to the scientific community, which was the main audience of the Société française de photographie. The Photo-Club had a real program : it was struggling to make photography recognized as an art and to give a real status to the creators. It corresponded to a new expectation that the established institutions could not satisfy.

However, one of its most important initiators, Maurice Bucquet, searched for acknowledgement of the

institution with distinguished members of the other photographic societies like Doctor Etienne-Jules Marey (the famous physiologist), Doctor Dujardin-Beaumetz and Albert Londe (already member of the French photographic society and the Société d'Excursions des Amateurs photographes: Excursions Society of the photographic Amateurs).

As the other guilds, the Photo-Club de Paris gave to its members the possibility to use a new modeling and development workshop, a chemistry laboratory dedicated to the tests, a library next to a reading room and other places to meet every month and to participate to the projections sessions.

In order to "show to the other photographic societies that the Photo-Club de Paris take an important part in the general toil" ("montrer aux autres sociétés qui s'occupent de photographie la part que le Photo-Club de Paris prend dans le labeur général," in *Bulletin du Photo-Club de Paris*, 1891, 9), the amateurs' association published between 1891 and 1902, the *Bulletin du Photo-Club de Paris* in which members could find a transcription of the photo-club's life: communications about techniques as well as artistic considerations, descriptions of novelties like new cameras or chemistry methods for development or pictures treatments and summaries of foreign researches. This publication had to sustain the debate and to claim the position of the Photo-Club. In 1903, the *Bulletin* became independent and turned its name into "La revue de photographie."

Thereby, the association took a central role in the diffusion of a new trend considered as the first artistic photographic movement. Beginning with the book of Peter Henry Emerson, *Naturalistic Photography for Students of the Art*, published in 1889, Pictorialism opened a new avenue for photographers. The Pictorialists saw the excursionist's and the family practices only as entertainment, whereas they treated their pictures with particular processes. Using printed techniques such as gum bichromate or oil transfer, they searched to give to their photographs drawing effects considered as the best way to make recognize photography as an art. But soon, two esthetics appeared, the vaporous one and the detailed one. A dispute to choose the best one followed.

To distinguish them from the excursionists, members of the Photo-Club de Paris took part to the international exhibition of 1892, the "first international exhibition of photography and related arts" ("Première exposition internationale de photographie et des arts qui s'y rattachent"), and soon organized the "First exhibition of photographic art" ("Première exposition internationale d'art photographique du Photo-Club de Paris) in 1894, from the 10th of January to the 30th of January, closely modeled on the French artistic Salon. The academic painter Léon Gérôme even presided the jury from 1895 to his death in 1904.

The creation of the Photo-Club de Paris was part of a worldwide movement, along with the Wiener Camera Club in Vienna, the Linked Ring based in London and the Camera Club of New York. These associations accelerated the internalization of the photographic institution, promoted the International Union of Photography, creating links between societies. The pictorial movement used their luxurious publications to diffuse their esthetics, works and researches.

In France, members of the Photo-Club de Paris and the most representative members of Pictorialism were Léon Robert Demachy (1859–1936) and Emile Constant Puyo (1857–1933). These charismatic leaders theorized the esthetic and wrote many articles published in different newspapers. They met each other at the Photo-Club in 1895. Less prominent figures included René Le Bègue and Henri Fourtier.

Very involved in printed technique, Demachy was one of the first to employ the gum bichromate already used by Alphonse Poitevin (in France) and John Pouncy (in Great Britain) in their own research during the 1850s.

He spread his method thanks to several articles and illustrated lectures in Paris, Brussels, and London. He was also a specialist of the bromoil process. These printed techniques made photographs look like drawings, gave them an artistic touch and permitted the interpretation of reality.

With the public recognition, first during the Exposition Universelle of 1900 in Paris, came the time of the suspicion about pictorialism. Some photographers and critics underlined its lack of creativity and innovation: the vogue of etheral and vaporous photography vanished with the birth of the "straight photography."

However, the Photo-Club de Paris' position about the artistic photography remained the same, always represented by amateurs. With the First World War, the association became less and less powerful but was still headed by one man, Constant Puyo (Demachy stopped his practice during the war) who still approved the same esthetic. In 1924, it became the responsibility of the French photographic Society to continue to organize photographic exhibitions.

The life of the Photo-Club de Paris had always been bound with the first artistic photographic movement. Its influence disappeared with the death of the pictorialist approach and the death of Puyo in 1933 marked its last activities.

Marion Perceval

See also: Demachy, (Léon) Robert; Puyo, Émile Joachim Constant; Gum Print; Société française de photographie; Pictorialism; Emerson, Peter Henry; Brotherhood of the Linked Ring; and Amateur Photographers, Camera Clubs, and Societies.

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PHOTOCHROM PROCESS

The Swiss process

This beautiful photomechanical process was worked out by one of the oldest printing and publishing firms in the world, Orell Füssly, of Zurich, Switzerland, funded in 1504 by Hans Rüegger. The firm still exists, along with Photoglob AG, founded by the former "Art Institute Orell Füssly" in 1889 for the worldwide distribution of photochrom pictures. Using up-to-date technology, they are currently the leading postcard publisher in Switzerland and their range of printed products include city maps and coffee-table books.

The descendants of Orell Füssly did not keep details of the trade secrets associated with the 19th century Photochrom process but a modern investigation by Dr Bruno Weber confirmed what many had been saying all along. The process was lithographic in nature and made use of a light-sensitive material first used by Nicéphore Niépce in 1814: asphalt, also known as bitumen, which can be dissolved in benzene and thinly coated onto a grained litho stone. When the coating is dry it can be exposed under a continuous-tone negative and after an exposure of 10 to 30 minutes under the summer sun (several hours in winter) the parts of the image that were protected from the light by the dark areas of the negative will remain soluble when subjected to a solvent such as turpentine. The rest of the image will remain on the stone and can be made ready to receive a greasy ink that will create a visible image that can then be transferred to paper.

While the above photographic system sounds simple, adapting it to the production of full color reproductions would be a different matter. The man who made this happen was Hans Jakob Schmid (1856–1924), a lithographer from the Swiss town of Nürensdorf. One can only imagine the difficulties involved in printing six to fifteen colors from a single black and white negative. One stone was required for each color. A registration system had to be designed that was so efficient that even today one needs a magnifying glass to discover minute imperfections in the printing process.

Very large editions of town views were made by this process, which can be classified as a form of screenless lithography. The Zurich Central Library currently houses about 10,000 Photochrom landscapes and city views given by the "Art Institute Orell Füssly" between the years 1891 and 1914.

The first photolithographic polychrome prints were made in 1886. At that time this new printing technology was referred to as "photo-chromo printing process." After 1888 it became known as "photochrom." It was also known under the name of Aäc.

Photochroms have almost the appearance of natural color photographs, although under a magnifying glass they will show a delicate grain pattern. Single illustrations printed in Switzerland, Germany and the US often have a characteristic caption in gold lettering along the base of the print, with a serial number and "P.Z." for Photochrom, Zurich.

In the UK the process was exploited by the Photochrom Company Ltd, which also used a different spelling for its name and its products: Photochrome (sic). Their large illustrations did not carry the P.Z. initials but did show a serial number. We do not know how active the English firm was but of the many Photochrom(e) Company illustrations that appeared in the *Penrose Annual*, all but one, in Vol. 9 (1903), were in fact conventional half-tone relief engravings.

There were other successful photolithographic operations including the Frey process invented by Frey & Söhne, of Zurich. This was acquired by Hudson & Kearns in Britain but never successfully exploited by them. There were also variants by Photostone, Wetzel & Naumann, Müller & Trüb, Schulz, etc.

In 1897 the Photochrom Co. of Detroit, USA, was created after William A. Livingstone (of The Detroit Photographic Company) went to Zurich to obtain exclusive U.S. rights to the Photochrom process which they used to print color postcards, beginning in 1898. In 1905 the company name was changed to the Detroit Publishing Company. From 1907 they also used Phostint as a trade name. The firm was active in the production of color printing until 1931. Much of the company's archive is now housed at the Library of Congress, in Washington, D.C. The collection includes over 25,000 glass negatives and transparencies as well as about 300 color photolithographic prints, mostly of the eastern United States. The collection includes the work of a number of photographers, one of whom was the well known photographer William Henry Jackson (1843–1942). Other parts of the collection are housed at the Colorado Historical Society (Denver, Colorado) which has approximately 13,000 images, primarily glass plate negatives of views west of the Mississippi. Their collection also includes vintage photographs, Photochrom prints, postcards, and the Detroit Publishing Company's negative record log. The Historical Society also has one of Jackson's diaries from the 1870s.

The Henry Ford Museum & Greenfield Village (Dearborn, Michigan) has approximately 18,000 vintage photographs, 9,500 postcards, and 2,500 Photochrom prints from the Detroit Publishing Company.

Photochrom was later adapted to offset lithography and produced excellent screenless color lithographs in various art books published between WW I and WW II (e.g., Gottfried Wälchli: Martin Disteli Romantische Tierbilder, Zürich/Leipzig, Verlag Amstutz & Herdeg, 1940). The last Photochrom operator, Frédéric Wälti, retired at the age 81 as recently as 1970.

The French Process

The Swiss photochrom process should not be confused with the similarly named multi-color process introduced by Léon Vidal in France in 1872. The "photochrome," often anglicized "photochromy," was first seen in the photographic exhibition at the Palais de l'Industrie in Paris in 1874. The prints were much like chromolithographs, except that the base illustration (key plate) was a photograph usually printed by the woodburytype process.

In other cases, the colors were applied in sections (selected manually) made by the carbon transfer process. These photochromes, never achieved the realistic effect of the Swiss process but they were suitable for printing reproductions of crowns, diamonds, and other precious objects from the Louvre and other French institutions. Fine examples can be seen in Paul Dalloz' *Trésor Artistique de la France, 1ère série,* (Paris, Moniteur Universel, 1883).

LUIS NADEAU

See also: Vidal, Léon; Poitevin, Alphonse; Photoglob Zurich/Orell Fussli & Co.; Postcard; and Photography and Reproduction.

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PHOTOGALVANOGRAPHY

The name of this photomechanical process came from Duncan C. Dallas, at one time manager of the Patent Photo-Galvanographic Company, a short-lived printing and publishing firm set up for the exploitation of an English patent granted to Paul Pretsch (1808–1873), an Austrian photographer and inventor.

Paul Pretsch arrived in London in 1854 and took out an English Patent, No. 2373, dated Nov. 9, 1854, for "Improvements in producing Copper and other Plates for Printing" In the following year he formed the Patent Photo-Galvanographic Company with a number of partners, including Roger Fenton (1819–1869), as the chief photographer.

Commencing in December 1856, they published a serial portfolio, *Photographic Art Treasures, or Nature and Art Illustrated by Art and Nature.* This was the first photographically engraved reproductions of works of art. There were five issues published, each containing four plates, the last publication appearing in early 1857. Their *intaglio* process, which was the first to utilize the reticulation of gelatin, was based in part on W.H.F. Talbot's 1852 photoglyphic engraving patent and produced plates often heavily retouched by hand engravers—a common practice in the printing industry at the time. Nevertheless, many of the plates were exceedingly good, considering the state of the printing technology at the time.

At a meeting of the Photographic Society of London in June 1856, Pretsch exhibited specimens of his work in various stages and read an interesting paper on "Photogalvanography, or Engraving by Light and Electricity," in which he explained the principles and applications of his process, founded on the peculiar properties of animal glue (gelatin) mixed with chemical ingredients so that it can be made to swell or shrink to produce images that could be turned into intaglio plates. In the course of discussion Pretsch stated that the granular appearance of the matrices was due more to the formation of silver chromate rather than to the iodide (*Phot. Journal,* vol. 3, 58). This chemically induced granularity is interesting and indeed questionable as more recent methods of photogalvanography and collotype printing used the effect of elevated temperature during the drying stage of the matrix.

In the same journal (vol. 5, 1859, 109 and 132), there is a reprint of another paper by Pretsch on "Photography subject to the Press," in which he gives his reasons for abandoning the etching methods of photo-engraving used by Talbot in favor of the photo-galvanographic and gave a short sketch of his method, stating that the granulation was a distinctive feature of it, and was indispensable for the reproduction of any tint by a printing plate. There is another paper on "Photo-galvanography, or Nature's Engraving" (vol. 6, 1959, 1) illustrating with a plate from a negative by O.G. Rejlander, "I pays," which is interesting not only as a good specimen of the process, but also because it is an early example of the process of *aciérage*, by which the electrotyped plate was coated with iron and so was made capable of yielding the large number of copies required (3,000) instead of having to prepare a number of duplicate plates or make a transfer to stone for inferior photolithographic results. A description of the aciérage process is given by F. Joubert, the inventor, in the same number of the journal.

Notwithstanding Pretsch's remarkable skills and inventions, much of his career, and the progress of photography and photomechanical printing in general, were harmed by W.H.F. Talbot's intransigence when it came to negotiating the licensing of his patents. A study of Talbot's correspondence, now made possible thanks to Larry J Schaaff's *The Correspondence of William Henry Fox Talbot* project, reveals a dark side to this otherwise well regarded inventor as we see him displaying an incredible level of greed and lack of respect for Pretsch's efforts. In early 1857 Pretsch was forced to abandon his publishing activities with the photogalvanic process following a lawsuit by Talbot. Despite this he kept improving his processes, notably for relief (block) printing, and maintained contact with Talbot, sending him specimens of his new methods and begging him for permission to exploit his new inventions. The following, from a letter Pretsch sent to Talbot, June 1, 1861, shows the level of desperation facing the Austrian inventor.

> Sir,
> I have been informed by Mr. Hogarth that you intend to postpone the conclusion and settlement of our affairs till your return from the Continent. I must confess that this would be too much for my means which are now utterly exhausted;—the transactions with yourself and Mr. Hogarth have been carried out since February (four months), and before that time since several years I have been living on my own resources, but which are now perfectly exhausted, and at an end without any hopes of being renewed. I do not suppose that it is your intention, to torture me;—I think I have not deserved such degrading pains for my hard labour and unceasing skillfull work.
>
> I have therefore to request most urgently the favour of you, that you may make your decision at once, whatever it may be.—Last Friday night has been forwarded to you the draft draught of the indenture with suggestions for your approval. I beg therefore to send your reply to this as soon as possible, and I rely at least in this instance on your reasonableness and impartial kindness.
>
> I enclose the impressions of two blocks which I have latterly finished. Both of them are *absolutely untouched by the graver*.
>
> Expecting very soon your kind reply, permit me to remain_Sir_Your very obedt. Servt
>
> Paul Pretsch

Despite many such efforts, his plea was not met favorably.

At the Exhibition of 1862, in London, he exhibited half-tone photogalvanographic plates in intaglio and in relief, and obtained the only medal awarded for that class of work. He did a good deal of work in illustrating the *Journal of the British Museum*, but found it, however, difficult to get on in London, and after a serious illness he returned to Vienna in 1863. He was taken on again in the Imperial State Printing Office, but his health had broken down and he made no further progress in perfecting his methods. In 1873 he died of cholera.

Others improved photogalvanography under the names of *helioplasty, leimtype photo-electrotype, swelled gelatin* and *wash-out processes*. It was employed in England almost exclusively by A. & C. Dawson, who styled themselves otherwise the Typographic Etching Company. It was in all essentials identical with the original Pretsch process. It had considerable merit, but was hopelessly expensive and slow compared with the other methods.

Luis Nadeau

See also: Pretsch, Paul.

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PHOTOGENIC DRAWING NEGATIVE

In 1834, William Henry Fox Talbot invented a light-sensitive paper that he named "photogenic drawing

paper." For the next ten years he used it to make his "photogenic drawings," by exposure to sunlight in contact with flat, semi-opaque objects, such as leaves, lace, clichés-verres, or printed pages—a type of image now called a photogram. In August 1835, using the same sensitized paper, Talbot succeeded in making the first camera photographs in silver, which he referred to as "Views taken with the camera obscura. The pictures … represent the scene reversed with respect to right and left, and also with respect to light and shade." It was not until 1840 that Sir John Herschel proposed the noun "negative" for such a photograph having a reversed tonal scale, but neither he nor Talbot ever used the expression "photogenic drawing negative," which has been coined in recent times to distinguish a camera negative recorded on photogenic drawing paper.

Talbot choose the finest rag paper available—customarily, the gelatin-sized writing-paper from John Whatman's Turkey Mill in Maidstone, Kent. He immersed each sheet for a few minutes in a dilute (ca. one per cent) solution of sodium chloride (common table salt), then, after blotting the sheet dry, he brushed one side of it with a strong (ca. 18 per cent) solution of silver nitrate. The result was to precipitate silver chloride within the fibres of the paper, according to the chemical reaction:

ILLUSTRATION

$AgNO_3 + NaCl \longrightarrow AgCl + NaNO_3$

silver + sodium —> silver + sodium
nitrate chloride chloride nitrate

The high concentration of silver nitrate ensured that an excess of this substance was retained within the paper—a condition that Talbot had found essential for light-sensitivity. The paper was usually dried in front of a fire. Upon exposure to sunlight for a few minutes, it turned a rich purplish-black, due to the formation of metallic silver in a finely-divided state, according to the photochemical reaction:

ILLUSTRATION

$light + AgCl \longrightarrow Ag + {}^1/_2Cl_2$

UV + silver —> silver + chlorine
light chloride metal gas

The chlorine evolved was rapidly absorbed by other constituents of the sensitized paper, otherwise it would have reversed the reaction. This is the silver chloride printing-out process, in which the silver image is formed entirely by the action of light; consequently, it has very low sensitivity compared with development processes. In contrast to the ease of making photograms with "photogenic drawing paper," it proved barely sensitive enough to yield negatives in a camera obscura, which had to be small, with a lens of large aperture to maximise the brightness of the image. Even so, exposures of about one hour were required, and the subjects had to be brightly sun-lit. Talbot's earliest known photogenic drawing negative—of the sky seen through a latticed window at Lacock Abbey—is dated August 1835. This, and other photogenic drawings, were first exhibited to the public at the Royal Institution on 25 January 1839, when Michael Faraday announced Talbot's invention.

After exposure, photogenic drawing paper remains sensitive to light owing to the unchanged silver chloride. In February 1835, Talbot discovered that the obliteration of his images could be prevented by treatment with a saturated (32 per cent) solution of sodium chloride, or a solution of potassium iodide; the former rendered the silver chloride much less light-sensitive, and the latter converted it to inert silver iodide, so that his photographs could conveniently be viewed in daylight. These were the first fixing processes: chloride-fixed specimens were often reddish-brown in the shadows and tended rapidly to acquire a characteristic pale lilac "veil" over their highlights, which Talbot found quite attractive; iodide-fixed images showed primrose-yellow highlights due to the colour of silver iodide. Both types of photograph remain somewhat light-sensitive, however, and cannot be exhibited without risk of perceptible damage. It has been estimated that a light exposure of only 3–4 hours under the most stringent gallery illumination of 50 lux, may cause a just-noticeable change in a halide-fixed photogenic drawing.

In January 1839, Sir John Herschel discovered the more effective "hypo" method of fixing—or "washing out" as he more accurately described it—using sodium thiosulphate (then known as "hyposulphite of soda") to dissolve out the residual silver chloride entirely. Photogenic drawings fixed by this means are stable to light, but if the sodium thiosulphate itself has not been fully washed out of the paper, they may fade severely owing to the slow conversion of image silver into yellowish silver sulphide:

ILLUSTRATION

$2Ag + Na_2S_2O_3 \longrightarrow Ag_2S + Na_2SO_3$

silver + sodium —> silver + sodium
metal thiosulphate sulphide sulphite

In March 1839, Talbot made the first use of silver bromide in photography—an important innovation for which he does not receive full credit. His "common photogenic paper" was treated with a ten per cent solution of potassium bromide to convert the silver chloride into silver bromide, and then coated with excess silver nitrate, to yield a more sensitive paper. Talbot privately called this his "Waterloo paper," and employed it with some success in his cameras until the use of photogenic drawing paper for negative-making was totally eclipsed,

in September 1840, by his pivotal discovery of the much faster calotype development process. Nonetheless, Talbot's recipe for "common photogenic drawing paper," which was not restricted by patent, continued to be universally used until ca.1855 to make positive contact prints from camera negatives; such positives, then called "re-transfers" or "copies," are today referred to as salted paper prints. Thiosulphate-fixation rapidly became the preferred method, although Talbot himself persisted in the use of halide (i.e., chloride, bromide, or iodide) print-fixation for some years, possibly due to an aesthetic preference for the interesting colours that the process generated, compared with the uniformly dull brown of the thiosulphate-fixed images.

The camera exposures for making photogenic drawing negatives were lengthy—typically, one hour—during which interval the sun moved relatively through an angle of 15 degrees of arc; consequently, in any sunlit scene, the areas of shadow were diminished and their hard edges diffused, while the reflections from highlights were multiplied. Photographs printed from photogenic drawing negatives often display a softness of modelling that is quite different from the chiaroscuro qualities seen in the much faster calotype process. Talbot's photogenic drawing negatives made in 1839–40 recorded the luminosity of his scenes with a delicacy that is quite inaccessible to the instantaneous vision of the human eye, and the modern camera.

MIKE WARE

See also: Talbot, William Henry Fox; Herschel, Sir John Frederick William; and Faraday, Michael.

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PHOTOGLOB ZURICH/ORELL FÜSSLI & CO.

Photochromy is a lithographic printing process for disseminating photographs via colour printing off several stones, a combination of collotype and chromolithography for the production of "photolithographic polychrome half-tone images." The process consists of the direct photographic transfer of an original negative onto litho and chromographic printing plates and is most commonly known by its commercial name of "photochrom."

Whilst Lemercier had experimented with an analogue process in the 1860s, and Vidal's process enjoyed limited dissemination in the 1870s, neither enjoyed commercial success Breakthrough occurred in the mid-1880s when a lithographer in Zürich, Switzerland experimented with the process successfully enough for Orell Füssli & Co., then a leading firm of banknote and map printers, to decide to incorporate it into its development and manufacturing plans. The first photolithographic polychrome half-tone prints produced by the firm in 1886 were always subsequently described as the firm's own invention, while the identity of the actual inventor was never mentioned in the firm's catalogues or other publications. The unheralded inventor was in fact Hans Jakob Schmid (1856–1924), a lithographer from Nürensdorf. He worked at Orell Füssli and Co. from November 1876 onwards, initially as a lithographer, then as a machine minder. After an experimental phase, a patent application was filed for the new process in Austria-Hungary on 4 January 1888.

Due to the business acumen of Heinrich Wild-Wirth (1840–1896), partner in the firm since 1873 with his brother Paul Felix, and, from 1890, chairman of the board, the photochrom process was widely disseminated and achieved unparalleled success in the market for colour photographs. The trading company Photochrom Zürich, founded in 1888 to exploit the process, incorporated the collotype printers and publishers Schröder & Co. in 1895. The company thereafter traded as Photoglob Co. (since 1974 Photoglob AG) and is still active, especially in the postcard business, as a subsidiary of Orell Füssli Graphische Betriebe AG. The Photochrom Co. Limited was established in London in 1896 as successor to the London office of Photochrom Zürich, set up in 1893. An identically named subsidiary in Detroit produced and marketed photochrom prints in America,

with the collaboration of William Henry Jackson. The photochrom market transformed the firm into an international concern.

The photochrom production process required the participation of four different specialists: photographer, chromolithographer, stone-polisher and planographic printer. The grained litho stone was coated with a thin layer of bitumen purified in ether and dissolved in benzene. On this light-sensitive surface, a reversed photographic half-tone negative was firmly applied, with the sensitized side face down. By means of exposure to daylight, lasting 10 to 30 minutes in summer, up to several hours in winter, the bitumen would harden in proportion to the action of the light, rendering it insoluble to normal solvents. Then the lithographer or photochrom operator washed the bitumen matrix in various acid-free turpentine solutions, soaking off the soft bitumen in proportion to the amount of exposure the plate had received. The matrix was then retouched painstakingly with cotton wool tabs or a badger's hair brush, in the tonal scale of the particular colour, strengthening or softening the tones as required. The gradation of the positive bitumen image could be strongly influenced by this manual procedure.

Following the chemically worked transformation of the photographic half-tones into the grain structure of the stone surface, the polisher treated the developed image with finely powdered pumice stone, for grinding the surface grain smooth. Readying the layer for subsequent etching remained a long guarded commercial secret. The prepared stone, with its highly resistant etching surface, was, according to this method, degreased with a solution of 1° to 3° nitric acid, as for normal litho stones, the image area repulsing the acid, then washed clean, dried, coated with moisture-bearing gum arabic, and dampened. After the fatty lithographic colours had been applied by roller, the stone was then ready for printing off. Each tint required a separate stone bearing the corresponding retouched image, and each print was usually the product of at least six, and as a rule between 10 and 15 tint stones, and thus an equal number of pulls through the press. An initial print run of "upwards of 150 to 200 impeccable prints" (*Photographische Correspondenz* 1888, 498) soon increased; individual print-runs are unknown, but probably amounted to several thousand prints by the early 1890s.

Photochrom prints subsequently became the object of an extraordinary collecting cult, rivalling stereo views as the favoured proxy souvenir of the armchair traveller. The photochrom operators' standard output consisted of landscapes and cityscapes, the colour range of which sometimes proved to be either too muted or too harsh in the early years, but then settled down to present all corners of the globe in a uniform photochrom style of characteristically slightly hazy watercolour tints. Photochrom Zürich was early on offering more than Swiss views—by 1891 it was supplying views of the Riviera, the Rhine valley, Italy, France, and Britain. The company was soon sending its own photographers out throughout the continent to take views of sites and monuments. In January 1896, the company's stock included 3,000 European subjects. A standing exhibition was opened in central Zürich "to give everyone the opportunity to view our whole picture collection and, on that basis, put together a travel itinerary."

Around this time the scope of the collection was broadened to include views from North Africa, Turkey, Syria and Palestine, India, Russia, and the United States, later Central and South America, adding Persia in 1911, alongside China, New South Wales, and New Zealand. The "P.Z." logo in gilt lettering on each print, standing for Photochrom and Photoglob Zürich, together with a caption and inventory number, served as an instantly recognisable trademark.

Prints were available in seven sizes, the majority in sizes II (16 × 12 cm.) and III (21 × 27 cm.). The mounts were available in six different designs: black with bevelled gilt edges, olive with broad gilt ruling, plain light grey with the print recessed, grey matt frame, washable enamel mount on laminate base, and on glass. An ideal photochrom library for the systematic collector in 1899 included a solid oak cabinet, with compartments designed to house 34 albums of 200 prints each—a total of 6800 prints.

Photochroms may be considered to constitute a significant achievement in printing technology wedded to dynamic marketing in the field of popular landscape imagery. After the First World War, which brought an end to the cult of this type of collecting, Orell Füssli's main output consisted of poster printing and high value art reproductions in the photochrom process. The last photochrom operator retired as recently as 1970. Orell Füssli Verlag AG is now a leading multi-media publishing house headquartered in Zürich. The trading arm Photoglob AG specializes in the distribution of maps, albums, illustrated works and guide books of Swiss interest.

About 10,000 unmounted photochrom prints are housed in the print collections of the Zurich Central Library, an annual donation by the Art Institute Orell Füssli and its subsidiary Photoglob Co., from 1891 to 1914, of that year's complete output.

STEVEN F. JOSEPH

See also: Collotype; Lemercier, Lerebours & Bareswill; Vidal, Léon; and Jackson, William Henry.

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PHOTOGLYPHIC ENGRAVING

Photoglyphic Engraving is an early process of photogravure invented by William Henry Fox Talbot (1800–1877), but one that was rapidly superseded by the Talbot-Klic process of 1879. Talbot's first photomechanical invention, "Improvements in the art of engraving, in which photographic processes are used" (English. Pat. No. 565), was recorded in 1852. Talbot had discovered the light-sensitivity of a mixture of potassium dichromate and gelatin. He was the first researcher to publish the fact that chromated gelatin becomes insoluble after exposure to light and loses its capacity of swelling in cold water.

He applied this principle to a printing process that made use of dichromated gelatin coated on a steel plate prepared for engraving. When dry, the gelatin coating was exposed to sunlight under a positive image. After exposure, the parts of the gelatin coating that were not exposed to light were dissolved in hot water, leaving a relief image. The plate was then ready for etching with bichloride of platinum, which was poured over the plate. This solution would first attack the thinner parts of the gelatin relief and would leave a depression in areas that were protected from light by the positive image. This depression could be filled with ink like any intaglio plate (etchings, line engravings, etc.) and the resulting image could be transferred onto paper with a printing press.

One can easily imagine that Talbot's first results were suitable for line reproductions. For the production of prints that produced the shades of a real photograph he invented a primitive form of half-tone screen: *photographic veils*. To quote from the patent abridgement, "To produce the effect of engraved lines or of uniform shading, the image of a piece of folded gauze, or other suitable material, is impressed upon the gelatin prior to the image of the object required being formed. Plates of zinc or lithographic stones are also readily engraved by this process." Nevertheless, Talbot himself admitted that his first photomechanical invention did not succeed in reproducing photographs with a full range of tones.

In his follow-up patent of 1858 (No. 875), he introduces new modes of etching. With the first method the picture is no longer washed, but as soon as it is removed from the copying frame it is covered with pulverized copal or other resin. This fine powder is then heated over a lamp, which makes it melt and stick to the plate. When the plate has cooled it is etched by means of a nearly saturated solution of perchloride of iron in water; the etching being accomplished in consequence of the perchloride solution penetrating the gelatin wherever the light has acted upon it, but refusing to penetrate those parts upon which the light has sufficiently acted.

Once again, we see an idea borrowed from traditional printmaking. In this case, it is the old aquatint etching process invented in the 1760s by J.B. Le Prince (1734–1784). With this intaglio process a full scale of tone is obtained by etching a multitude of extremely small pockmarks in a random manner on the printing plate. Niepce de Saint-Victor had documented the use of the aquatint grain in his *Traité Pratique de Gravure Héliographique* (Paris, 1856, 44).

In another variant of the etching process, the exposed picture is washed in warm water before receiving the resin powder. Another method made use of an electrotype etching. Specimens of Talbot's new processes appeared in *Photographic News* in 1858 as reproductions of photographs of Spain, France and elsewhere by Soulier and Clouzard. William Crookes, the publisher of *Photographic News*, was quite impressed by Talbot's new invention:

> We have recently been favoured with the inspection of some new photographic prints, or to speak more correctly, PHOTOGLYPHIC ENGRAVINGS, executed by a new process, the result of experiments made by Mr. H. Fox Talbot. By means of his invention common paper photographs can be transferred to plates of steel, copper, or zinc, and impressions printed off afterwards with the usual printer's ink. The plates engraved by this mode are indeed beautiful in themselves as photographs, and will bear strong microscopic inspection, the most minute detail being given with astonishing fidelity. They are free from many of the imperfections which were so evident in former attempts, and the manner in which the half-tones are given is really wonderful; the specimens are of various subjects, showing the perfection which can be obtained in any branch of pictures. Even in these copies the detail is so fine that when a powerful microscopic power is brought to bear on them, we are enabled to trace the names in the shops in the distance, and easily read the play-bills in the foreground, and this in a picture only a few inches square, while the minuteness in architectural subjects is most remarkable. In a view of Paris there is all that can be desired in half-tones, and the perspective is almost as good as in a photograph.

The new invention was named "Photoglyphic Engraving" by Talbot and led to a considerable amount of activity among experimenters. It eventually evolved in what became known as the Talbot-Klic process, which was introduced in 1879, two years after Talbot's death.

This process is also referred to as heliographic etching with chromated gelatin process, photographic

etching, photoetching; photoglyphy and photoglyptic engraving.

LUIS NADEAU

See also: Heliogravure; Photogravure; and Talbot, William Henry Fox.

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PHOTOGRAMMETRY

Photogrammetry, the art of making measurements from images, synthesizes the science of mathematics and the technology of photography. The development of photography in the 19th century, which is the embodiment of projective geometry, led to widespread development of photogrammetry for topographic and architectural measurement by the end of the century.

The mathematical basis of photogrammetry is projective geometry; initial work in this area was done by Lambert (1728–1777), with Poncelet's 1822 treatise providing a broad basis for later development. Projective geometry is a generalization of standard Euclidean geometry, with the basic axiom being that parallel lines meet in a point. This describes the properties of central perspective, in that parallel lines imaged by a lens appear to meet at the vanishing point.

Given this mathematical basis, mapping was first attempted using freehand perspective drawings from multiple viewpoints. In 1846, Aimé Laussedat (1819–1904), a captain in the French Army, experimented with freehand perspective drawings for mapping of the Pyrenees. Discovering the limited accuracy and detail from using freehand drawings, he experimented with the *camera lucida*. The camera lucida used a four-sided prism to project a view of the scene onto the drawing paper, where it could be traced by the operator. After several improvements to the device and the development of graphical techniques to produce the final map, Laussedat produced drawings of the façade of l'Hotel des Invalides in 1849 and a topographic map of the fort du Vincennes in 1850. He named this technique *iconometrie*.

The development of photography at this time provided another method of generating perspective views, although Laussedat realized that existing cameras would not be suitable for mapping purposes due to their narrow fields of view and lack of calibrated orientation. He therefore commissioned the Paris instrument maker Brunner to construct a camera to his specifications in 1859. The camera had a 50cm focal length lens and used glass plates with a 27×33 cm format. The internal camera geometry was established by *fiducial marks* exposed on the plates, which allowed the reconstruction of the position of the plate relative to the principal point (intersection of the optical axis with the image plane). The first topographic map was produced in 1861 depicting the village of Buc and covering approximately 200 hectares. This and other successful mapping demonstrations led to the establishment of a French military mapping unit using Laussedat's equipment and techniques.

Albrecht Meydenbaur, a German architect, realized the potential of photography for documenting and measuring buildings. Understanding the limitations of the cameras of the time, he designed his own camera which combined stable imaging geometry with a measuring circle from a surveying instrument. His *phototheodolite* was tripod-mounted and had a wide angle lens with a 105° field of view and a 25cm focal length, imaging onto a 30×30 cm and later 40×40 cm format glass plate. Leveling screws maintained the image plane in a vertical position, thereby simplifying the graphical reduction of the data. Later versions were designed to be collapsible, to ease transportation, and with a lens which could be vertically shifted to better record buildings.

Meydenbaur's initial experiments were performed in 1867 in Freyburg-on-Unstrut, where he photogrammetrically documented the town church and topography. In a paper describing this work he introduced the term "photogrammetrie." While military applications were unsuccessful, the detailed metric information derived from his photographs proved valuable for architectural documentation. His work led to the formation of the Royal Prussian Photogrammetric Institute, whose goal was the photogrammetric documentation of German cultural monuments and which still holds a large archive of Meydenbaur's photographs.

Ignazio Porro (1801–1875), an Italian surveyor and instrument maker, developed a panoramic camera for mapping in 1858. By mechanically scanning a narrow field-of-view lens he obtained a wide field of view without the accompanying lens distortion. However, data reduction from the panoramic imagery could not

be done using the standard graphical methods; Porro therefore invented the *photogoniometer*, a telescope placed at the optical center which measured the angles at the camera position between objects in the scene. The telescope used the same type of lens as the camera, thereby canceling out the effects of lens distortion in the measurement. Later rediscovered by Koppe, this Porro-Koppe design principle has been widely used in photogrammetric equipment.

The latter part of the 19th century saw widespread adoption of photogrammetry for topographic mapping in many different countries. The first textbook on photogrammetry was published by Carl Koppe in 1889.

Data reduction was initially accomplished using graphical methods similar to those used in standard surveying. Instruments were designed to automate the operations involved in drafting, using mechanical joints to reproduce the projection through the lens. However, these approaches had the shortcoming of requiring identifiable points in each image, a difficulty for topographic mapping.

The introduction of stereoscopy and the invention of lens and mirror stereoscopes pointed to a different approach to the problem, although the first instrument to use stereoscopic viewing was not introduced until 1896 by Deville in Canada. Based on a Wheatstone mirror stereoscope, the instrument was not geometrically rigorous and was difficult to use since it required that the operator simultaneously view the stereo model through half-silvered mirrors and a physical point in the stereo space.

One of the biggest issues in applying photogrammetry to topographic mapping was the lack of a suitable viewpoint, especially in flat or wooded terrain. Laussedat conducted experiments with Tournachon (Nadar) in 1858 on using photographs from balloons, although the wet collodion process used was difficult to accomplish in a balloon. With the introduction of dry plates balloon photography became more practical and military reconnaissance operations became widespread. However, mapping presented further problems, including covering wide areas and determining the position and orientation of the photograph. Wide area coverage was achieved by using panoramic cameras or by using multiple synchronized cameras at different viewing angles. Camera position was determined using known photo-identifiable points or geometric figures on the ground, while mechanical devices were used to maintain the camera axis in a vertical orientation.

Aerial photography from kites also became common, using trains of kites carrying stabilized cameras. Cameras could be lowered to change plates without lowering the kite.

J. Chris McGlone

See also: Camera Design: Panoramic Cameras; Camera Design: Stereo Cameras; Meydenbauer, Albrecht; Military Photography; Nadar (Gaspard-Félix Tournachon); Panoramic Photography; Perspective; Aerial Photography; and Stereoscopy.

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PHOTOGRAMS OF THE YEAR (1888–1961)

Photograms of the Year began as the November 1894 issue of the British journal *Photogram*. In the inaugural issue, the editors wrote of their hopes for a separate, more fully realized volume the following year. Devoted to photography "as a means of artistic expression fully up-to-date," the stated aim of the publication was to review exhibitions in England and the United States and reproduce a representative selection for critique. Henry Snowden Ward and Catharine Weed Barnes Ward, editors of the *Photogram*, started the annual. Both had extensive experience as photographers, writers, and editors of other photograph magazines, and their names were well-known in photographic circles in the United States and England. They knew many influential photographers and writers, and were able to engage people like A. Horsley Hinton, editor of the British journal *Amateur Photographer* and author of several books on photography; writer and master of the gum-bichromate process, Robert Demachy and Alfred Stieglitz, leader of the American Photo-Secession, to write articles.

The annual emerged out of the photography movement known as pictorialism and art photography that began in the last decade of the 19th century. Until World War I, the title positioned itself in the center of that movement in Europe and the United States and played a secondary role in the dialogue about the nature of artistic photography stirring the photographic world at

the time. The audience for the journal was the serious amateur photographer who wanted to perfect his craft, and aspired to make a photograph situated within an artistic tradition. The reviews made a point of aesthetic analysis, and in the first issue, the Linked Ring exhibition was lauded for showcasing expressive photographs that eschewed technique over purer artistic aspirations. In these early years, the annual reported on the latest artistic developments, and followed the careers of the major international figures—with news and reproductions of works by important British photographer H.P. Robinson**,** pioneering American Alvin Langdon Coburn, venerable Baron Adolf de Mayer and newcomer Edward Steichen. Exhibitions large and small were covered, along with the groundbreaking salons at the turn of the century, including the Photographic Society of Philadelphia Salons and the Photo-Club de Paris. This focus on exhibitions would remain throughout the life of the title. As the annual was published in Great Britain, the yearly Royal Photographic Society exhibition and other British displays were covered, along with reports and analysis of the year's exhibits in Europe, the United States, Canada, Australia, South Africa, and Japan. With the exception of a few lead articles on more general topics, the body of the journal was given over to geographically centered assessments of the state of artistic photography and critiques of the numerous reproductions published in every volume. The editors also opened the pages to works from readers for review.

The annual remained devoted to pictorial photography and the salon movement for close to 70 years. As the international art world changed, and pictorial photography was no longer considered the most progressive form, the emphasis of the periodical shifted to the myriad small photographic societies that cropped up in every major metropolitan area as well as smaller cities and towns. These groups kept the pictorial photography movement alive in the 20th century. In 1961, the title changed to *New Photograms*, and contained the expected reviews of exhibitions worldwide and analysis of individual works. But the editor gently criticized pictorial photography for being somewhat conformist and lacking in vitality. He announced an expansion of content to embrace less conventional aspects of the genre, including photojournalism and more experimental works. Curiously, this was be to the last volume.

BECKY SIMMONS

See also: Ward, Henry Snowden; Ward, Catherine Weed Barnes; Hinton, Alfred Horsley; Amateur Photographer (1884–)*;* Demachy, (Léon) Robert; Stieglitz, Alfred; Art Photography; Pictorialism; Brotherhood of the Linked Ring; Robinson, Henry Peach; Coburn, Alvin Langdon; Steichen, Edward J.; Photo-Club de Paris; and Royal Photographic Society.

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PHOTOGRAPHIC AND FINE ARTS JOURNAL, THE

The Photographic Art Journal was published between 1851 and 1860 in New York City by Henry Hunt Snelling; the journal was retitled *The Photographic and Fine Arts Journal* in 1854. The publication was the second photographic trade journal produced in the United States (following behind the *Daguerrean Journal*, later *Humphrey's Journal*), and offers insights into the development of the daguerreotype to the age of collodion in the United States, with particular focus on New York City in the age of Mathew Brady.

The journal's view of photography aligned it more with the fine arts than the scientific approach to photography advanced in the pages of *The American Journal of Photography* and *Humphrey's*. "Photography," Snelling wrote, was viewed "too much as a mechanical occupation...In too many instances men enter into it because they can get nothing else to do; without the least appreciation of its merits as an art of refinement, without the taste to guide them and without the love and ambition to study more than its practical applications." Such a narrow interest neglected both the sciences "drawing, painting and sculpture, sister arts, a knowledge of which [would] elevate taste and direct the operator into the more classical walks of his profession," Snelling wrote in the first issue of 1851. He wrote of his concern with the moral elements of the daguerrean art but the journal also serialized technical manuals like Philip Delamotte's *The Practice of Photography* and Désiré van Monkhoven *Photography on Collodion*.

Like its contemporaries, the journal relied on reprints to fill its pages, drawing widely from publications as diverse *as Hunt's Merchant's Magazine*, the *London Art Journal* and *La Lumiere* on such topics ranging from forgery to photographic chemistry. A series of unsigned

articles, "Photographic Galleries of America," which profiled commercial studios in Philadelphia, Washington, New York, Baltimore, Cincinnati, and Richmond in the mid and late 1850s is particularly useful for the photographic historian. Writers for the journal included Marcus Aurelius Root, the Philadelphia daguerreotypist, who published early excerpts of *The Camera and the Pencil* in its pages, and New York daguerreotypist and photographer Nathan G. Burgess.

While publishing the journal, Snelling met Edward and Henry Anthony and later became the general manager for their photographic supply business, E. and H. T. Anthony and Company. Snelling was also a photographic publisher, reprinting Delamotte's manual and T.F. Hardwich's *Manual of Photographic Chemistry*, originally published in London. Snelling himself authored *The History and Practice of the Art of Photography* (1849), *A Dictionary of the Photographic Art* (1854) and *A Guide to the Whole Art of Photography*, a gallery start-up manual (1858). Snelling sold the journal to Charles A. Seely, editor of the *American Journal of Photography* in 1860, and was subsequently less of a presence in the photographic press, although he continued to write for *The Philadelphia Photographer* and *Anthony's Photographic Bulletin* in the 1870s and the 1880s.

The journal is a frequent source of information for Robert Taft's *Photography and the American Scene* (1938, reprint 1964). Alan Trachtenberg cites the journal in his cultural history of the daguerrean era in *Reading American Photographs: Images as History, Mathew Brady to Walker Evans* (1989) and Mary Panzer, in *Mathew Brady and the Image of History* (1997), draws on Snelling's view of daguerreotypes in her cultural and photographic history of Brady's New York.

ANDREA L. VOLPE

See also: Snelling, Henry Hunt; and Brady, Mathew B.

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PHOTOGRAPHIC EXCHANGE CLUB AND PHOTOGRAPHIC SOCIETY CLUB, LONDON

During the 1850s, the exchange of photographs between some early practitioners became formalised. Two clubs are referred to as the Photographic Exchange Club and both were instigated in 1853: the Photographic Exchange Club (1853) and the Photographic Society Club (1853). Among other organisations, which advertised photographic exchanges, were the Liverpool and National Photographic Exchange Club (1856), the Architectural Photographic Association (1857) and the Amateur Photographic Association (1859).

The aim of the earliest clubs was to enlarge the portfolios of amateurs throughout Great Britain who had limited leisure to devote to photography. Clubs for the exchange of prints, such as etchings, already existed and distribution was made possible by the postal service.

Photographic exchanges achieved rapid popularity because of the large number of positives that could readily be obtained from a negative.

The Photographic Exchange Club was advertised first through the pages of *Notes and Queries*, a fortnightly, antiquarian periodical edited by one of the club members, William John Thoms. The Photographic Society Club was established from within the newly formed Photographic Society of London (later RPS) and publicised in the *Journal of the Photographic Society*. In both clubs, the first issues of photographs did not take place until 1855. Some photographers participated in both exchanges.

The Photographic Exchange Club appears to have begun as an antiquarian exchange. A printed leaflet (RPS Collection, NmeN) contains a list of members and the rules of the exchange. Initially, there were twenty-one members, but ultimately twenty eight members took part in one or more exchanges. The members were Francis Bedford, W. G. Cambell, A. B. Cotton, Francis Edmond Currey, Philip Henry Delamotte, Hugh Welch Diamond, Thomas Damant Eaton, Joseph James Forrester, George Glossop, Robert Howlett, Edward Kater, John Dilwyn Llewelyn, Robert Wilfred Skeffington Lutwidge, Thomas George Mackinlay, John Richardson Major, Thomas Lukis Mansell, Sir William Newton, Lady Caroline Nevill, Lady Augusta Mostyn (nee Nevill), John Percy, Henry Pollock, Arthur Julius Pollock, William Lake Price, Henry Peach Robinson, Alfred Rosling, George Shadbolt, William John Thoms, Peter Wickens Fry was listed as a member but did not take part in the exchange.

The cost of membership was 10 shillings per annum to cover expenses. John Richard Major was secretary and treasurer. Every member sent him the requested number of copies of the same un-mounted image and he compiled and posted out a complete set of different prints to each of them. In some cases the recipient incorporated these prints into their own albums (Pollock album, Arnold Crane Collection, Getty), others mounted them on individually in a portfolio (Eaton Collection, Norfolk Record Office). Only two sets of bound exchange clubs prints are known to exist. They are the 1855 and 1857 Exchange Club albums of Lady Augusta Mostyn, which have printed title and content pages (IMP/GEH), and of Henry Peach Robinson (RPS/NmeN).

The photographic exchange operated by the Photographic Society Club produced a typographically printed album with pasted-in photographs in a limited edition of about 50. The Chiswick Press imprint and typographic design suggests that Joseph Cundall, publisher and club member was actively involved. As well as a printed title and photographer's name, each print was accompanied by technical details, such as lens aperture and exposure time, and a page of poetry or prose. Benjamin Brecknell Turner was the first secretary of the Photographic Society Club exchange, nominally, he was succeeded by Philip Henry Delamotte. Forty-four photographers contributed to the 1855 album and thirty-nine to the 1857 album.

The contributors to one or both albums were J. Anthony, A. Batson, F. Bedford, Sir J. Coghill Bart., C. Conway Jr., J. Cundall, F.E. Currey, H. W. Diamond, P.H. Delamotte, R. Fenton, J.J. Forester, G.B. Gething J. J. Heilman, T.H. Hennah, F. Horne, R. Howlett, A Kerr, Rev. J. Knight, J.D. Llewlyn, R.W.S. Lutwidge, Mary E. Lynn, Rev F S Marshall, Count de Montizion, T.G. Mackinlay, J.R.Major, J.R. Major D.D., J.L. Mansell, W.W. Nichol, Lord O'Fitzgerald, Dr Percy, Lieut Petley, W.C. Plunkett, A.J. Pollock, H. Pollock, L. Price, O.G. Rejlander, G. Shadbolt, J.Stewart, G Stokes, W.J. Thoms, H. Taylor, A. Rosling, B.B. Turner, W.E.Vivian, H. White. Operational details and costs are yet to emerge, but remaining copies of the album were available at 10 Gns (£10 10s).

The two early photographic exchange clubs set national standards for the production of photographs and they established image types for the rest of the nineteenth century. Both these exchange clubs ceased to operate after 1858. With the commercialisation of photography, many of the first generation of practitioners stopped photographing. One group, including Delamotte, Fenton and Lake Price proposed a commercial exchange, the Photographic Association (Ltd), with shareholders and management salaries. Some became members of other exchanges, Shadbolt become Vice-President of the North London Photographic Association, and, in particular, several joined the Amateur Photographic Association, which was to become the main mechanism for the exchange of photographs during the 1860s.

CAROLYN BLOORE

See also: Fenton, Roger; Fry, Peter Wickens; and Diamond, Hugh.

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PHOTOGRAPHIC JEWELRY

Jewelry that contains an image rather than a stone combines decoration (jewelry) with function (an image of a loved one). Photographs began replacing cameos and miniatures beginning with daguerreotypes. The photographic method dictated the style of the jewelry. Daguerreotypes required a glass covering and appeared in traditional jewelry such as rings, pendants, lockets, and bracelets. Tintypes took a decorative form as suspender clasps and belt buckles. The history of photographic jewelry spans from the daguerreotype to the present.

Worn by men, women, and children photographic jewelry lent itself to a variety of settings depending on sex and age. Women generally selected pins, lockets, rings, bracelets, and even coat buttons including matched sets of bracelets, earrings, and necklaces. Men favored keywinds (used to wind watches), watch fobs, rings, cuff links, stick pins, and coat buttons.

Before the late nineteenth century, all of these pieces were custom-made for specific clients with unique images. Individuals interested in owning one could purchase it directly from a photographic studio or have a jeweler insert the picture into a setting. It took skill to create the item so that the image was not damaged when set into the piece. Jewelers created specially made pieces, using precious metals and marketed them to affluent clients. Costume jewelry settings made of brass also existed. With the advent of mail order catalogs in the late nineteenth century customers could choose photo garter buckles, belt buckles, charms and buttons to show off paper prints or tintypes usually covered with a piece

of protective glass. Abraham Lincoln used a tintype portrait button for political campaigning.

J.B Dancer's development of microphotography in the 1850s created a new trend—stanhopes. A microscopic image could be included in any item including jewelry. When held to the light, the magnifying glass peephole allowed for viewing. Most stanhopes feature multiple scenes of tourist locations.

Queen Victoria popularized photographic jewelry as a symbol of mourning when she wore pieces adorned with Prince Albert's image after his death in 1861. Most mourning pieces of photographic jewelry contain a reminder of the deceased. In the period 1861–1880 photographs appeared in lockets and brooches with a swiveling compartment to hold swatches of hair or clothing. Photographer William Bambridge of Windsor created some of the first pieces worn by Queen Victoria. She also ordered a set of nine gold lockets from Garrard & Company, possibly for her children. Dancer designed a mourning ring for Queen Victoria that contained a photograph of Prince Albert attributed to John Jabez Edwin Mayall. The Queen wore jewelry with Albert's image for the rest of her life, choosing a photographic bracelet for the Diamond Jubilee.

Most of the images included in jewelry are portraits. Usually these individuals had a familial relationship with the owner of the piece. Today, most of these images are nameless and separated from the original family. Identification of the image is possible based on several factors: the type of photographic image; clothing worn for the portrait; and jewelry setting. The photographic method establishes a creation date for the piece, but not necessarily a timeframe for the image. Since different settings faded into and out of fashion, the style and type of jewelry determines when the piece was fashionable. Costume assigns a narrower span of dates based on clothing details. Any locks of hair, handwriting samples, fabric swatches, or other types of insertions behind the picture can help identify the subject of the piece. It is important to be careful when establishing a date for a piece of photographic jewelry. Later images could be set into older pieces of jewelry or vice versa. Examine the jewelry and the image thoroughly before deciding on a time frame.

Since photographic jewelry is collected both as jewelry and as photography—the two linked by their setting, it is not unusual to find the jewelry without the image. Early collectors often discarded the unidentified image. The value of a piece of photographic jewelry depends on the type of image, the metal used, whether it includes hair or other evidence, and the rarity of the setting. Lockets and pins are common with rings and keywinds the most unusual. Today, photographic jewelry is very collectible and difficult to locate.

MAUREEN TAYLOR

See also: Daguerreotype; Tintype (Ferrotype, Melainotype); Mayall, John Jabez Edwin; and Victoria, Queen and Albert, Prince Consort.

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PHOTOGRAPHIC NEWS (1858–1908)

The *Photographic News* was an important agent in the popular dissemination of photographic knowledge. It commenced publication as a weekly journal on September 10, 1858, selling for 3*d*. unstamped or 4. stamped. The first issue consisted of twelve pages of text and six pages of adverts. Unlike the pre-existing photographic journals, the *Photographic News* was not the organ of any of the London or regional photographic societies.

The success of the *Photographic News* was a product of the growing number of professional practitioners in the late 1850s. As the introductory address of the second volume claimed, "the *News* has done what other journals of similar character failed to do; made photography a subject of interest to the public generally" ("Preface" iv). The range of subjects covered by the journal made it more lively and readable than its principal competitor, the *British Journal of Photography*. It quickly established a successful format that was to last until the mid 1880s. In these years it also produced an accompanying publication, *The Yearbook of Photography and Photographic News Almanac*. The main areas covered by the journal were technical improvements and instruction; notes and queries; critical reviews of literature and exhibitions; trade gossip; and reports from the photographic societies of Britain and Europe.

The first editor of the *Photographic News* was William Crokes, a distinguished chemist who was also

secretary of the Royal Institution. After January 1860, the journal was edited jointly by Thomas Piper and George Wharton-Simpson. Simpson remained as editor until his sudden death in 1880, having also become sole proprietor of the journal in 1860. It was under Simpson's imprimatur that the *Photographic News* was the leading photographic journal. Simpson provided excellent reports of international developments in photography and introduced many contributors who subsequently became well-known photographic figures. These included Henry Peach Robinson**,** A.W. Vogel and Colonel Stuart Wortley. After Simpson's death, the journal was taken over by H. Baden Pritchard, the head of the photographic department at the Royal Arsenal, Woolwich. Pritchard introduced the illustration of photographs and the *Photographic News* is a significant historical record of early forms of photomechanical reproduction.

The *Photographic News* was at its most influential from the late 1850s to the mid 1880s. During this period, its readership was predominantly made up of professional photographers. It was the increasing ease with which photography could be carried out, combined with the corresponding increase in the number of amateurs, which meant the alteration and subsequent slow decline of the *Photographic News*. In 1884, Pritchard died and Thomas Bolas became editor. In 1891, Pritchard's widow sold the journal to T.C. Hepworth, who attempted to make the journal much more attractive to amateur photographers. In 1892, it changed proprietors for the final time and reformatted itself as primarily a paper for amateurs. Trade gossip gave way to a weekly competitions and pictorial analysis. Subsequent editors were E.J. Wall (1897–1902), Richard Penlake (1902–1906) and F.J. Mortimer (1906–1908). The journal finally ceased publication in 1908 when it was amalgamated with the *Amateur Photographer*.

JOHN PLUNKETT

See also: British Journal of Photography; Robinson, Henry Peach; Vogel, Hermann Wilhelm; and Pritchard, Henry Baden.

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PHOTOGRAPHIC NOTES (1956–1867)

Edited by Thomas Sutton (1819–1875) the 'indefatigable experimenter and journalist' (*British Journal Photographic Almanac* 1876, 22) *Photographic Notes* appeared on 1 January 1856 and ceased publication in 1867 when it merged in February into *The Illustrated Photographer* which started publication that same month. During the early part of its life it was associated with Blanquart-Evrard who wrote occasionally for it, and with whom Sutton worked, and it became the house journal for the Manchester Photographic Society, Photographic Society of Scotland and Birmingham Photographic Society. The editorial content of *Photographic Notes* reflected the preferences and prejudices of its editor and Sutton was not afraid to voice opinions that other contemporary publications would not—notably against the Photographic Society of London.

The first numbers of *Photographic Notes* appeared in January and February 1856, published in Jersey by Sutton and Blanquart-Evrard from St Brelade's Bay, Jersey where Sutton was resident and ran his own photographic printing works. The publication was more successful than Sutton had anticipated, for a second edition of these numbers was published on 1 May 1856 in a 'remodelled' form 'suppressing two or three articles of minor importance.' A third edition was also published of numbers 1 to 4. Throughout the earlier period of the journal, revised or combined editions of particular numbers were issued.

Sutton described the journal as being ready to report the proceedings of photographic societies in the United Kingdom; to include notices of matters relating either to the theory or practice of photography; at the service of the professional and amateur photographer; to include extracts from foreign journals; and leaders that will contain a resume of the photographic views and a discussion of the photographic topics of the day. He concluded 'in offering our own opinions, we wish it to be understood that we invite discussion'.

In issue 5 of 25 April 1856 Sutton reported that *Photographic Notes* had 'obtained a circulation more than half that of the Journal of the Parent [the Photographic of London] Society.' The May issue reported that it had been adopted as the journal of the Photographic Society of Scotland and in June that the Manchester Photographic Society had adopted it. The Birmingham Photographic Society adopted the journal from early 1857. Monthly publication was stopped in favour of fortnightly publication on the 1st and 15th of the month from 1 September 1856. With issue 13 of 15 October Sutton reported that circulation had 'received a sudden increase' and that numbers 3 and 11 were out of print and that 4 and 12 nearly so. He would be reprinting back numbers and increasing the print run.

Sutton did not include material already published in other British photographic journals, principally the *Liverpool Photographic Journal* (later the *British Journal of Photography*) and the *Journal of the Photographic*

Society and in October 1857 attributed the success of *Photographic Notes* to the fact that it did not copy articles and the demise of the *Photographic Record* and *Liverpool Photographic Journal* to copying. He claimed to address the 'whole class' of British photographers and not certain sections. He did include material that he consider useful from French and American journals on occasion and by early 1858 was making arrangements to distribute *Photographic Notes* to America.

The contemporary view of the *Photographic Notes* is best summed by J Trail Taylor writing in the manuscript journal *The Photographer* and reproduced in *Photographic Notes* (15 June 1857) 'Photographic Notes, from the beginning, has occupied a high place' and reflects the individuality of the editor 'who is everywhere present from the title page to the closing advertisement. He writes as he thinks, and his honesty may be relied on, for the he seems ever ready to retract what he finds erroneous.' For this reason *Photographic Notes* provides a useful alternative to contemporary debates and issues and in it's early years it's frequency gave it a topicality not enjoyed by its rivals.

MICHAEL PRITCHARD

See also: Blanquart-Evrard, Louis-Désiré; and Sutton, Thomas.

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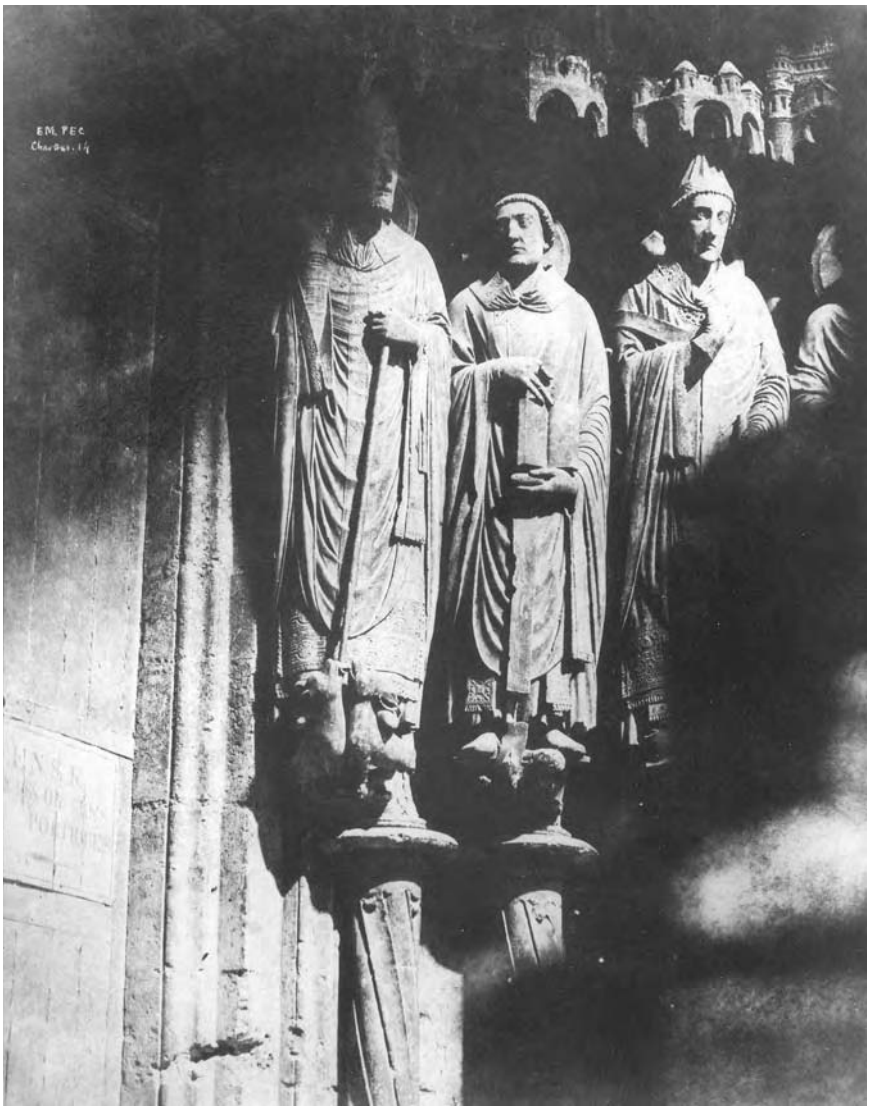
PHOTOGRAPHIC PRACTICES

Photography in the 19th century was very much a practice, from the studio or the photographic van to the card album and photolithographic publication. The following presentation will concentrate on practices involving the use of photographs, a vast topic in view of the formidable spread of photography in the 19th century.

The 19th century viewed, appreciated and used photographs not just as images but as objects. Because of the amount of investment, technique, and effort that was required to produce a satisfactory and durable photograph, and because the overwhelming majority of photographs produced were portraits, photographs were treated not just as valuable images but as precious objects, especially in the early days. This was particularly true in non-reproducible processes such as the daguerreotype and its later imitation the ferrotype, or tintype. The daguerreotype, nicknamed "silver plate," sometimes hand-colored and often gilded, was inherently a precious object, and visitors to some of the more ambitious daguerreotype "galleries," such as Mathew Brady's in New York, regularly described them as fairy-like, glittering palaces. More commonly, daguerreotypes and tintypes, because they were single images with hard metal bases, usually small, and generally portraits, invited procedures of preservation and exhibition that tended to define them as both relics and ornaments. Thus the finished daguerreotype or tintype would be framed and inserted in a wallet or case, often decorated on the outside and lined with red or purple velvet inside. This made it possible to mail the picture or to carry it along, as soldiers often did, but also to display it and treasure it, in the same fashion as miniature paintings had been earlier. In the era of the daguerreotype, when obtaining a portrait of oneself or of one's family or friends was a rare and a costly occurrence, and since such portraits had a very strong sentimental value, likenesses of loved ones were prized objects that expressed a combination of feeling, novelty, and prestige, as indicated by early daguerreotypes with sitters holding another daguerreotype portrait. Daguerreotypes were shown in the sitting-room, sometimes carried to formal occasions, but also sent as gifts to far-away friends and relatives, even across oceans, and the action of opening the case added solemnity to the experience of seeing a face that might not have been known beforehand. From 1840 on, the business of daguerreotype frames and cases was one of the most successful and creative activities deriving from photography. Although the demand for cases faded with the decline of the daguerreotypes in the 1850s, it picked up again with the popularization of the tintype. Historian Robert Taft reported a case of an American manufacturer receiving an order in 1862 from a single operator for 3000 gross of these cases. A cheaper form of presentation for tintypes was to mount them in envelopes with a window for viewing the picture. A related practice, although rarer and more status-conscious, was to insert miniature daguerreotype portraits of beloved ones or spouses in various kinds of jewels, such as pocketwatch cases and brooches. All of these practices amounted to a kind of framing, by which the emotional appeal of the picture was at the same time highlighted and confined. Similarly, and in keeping with the constant 19th-century association of photography with the memorializing of the deceased, portraits of loved ones in daguerreotype, and then in tintype as well as in photographs transferred onto ceramic bases, were often placed on graves, and patents for the fastening of such effigies on tombstones were taken out starting in the 1850s. These ritualistic, almost religious, uses were also common with paper photographs later in the century, as is evident from mentions of them in novels such as Thomas Hardy's *Jude the Obscure* and especially Marcel Proust's *Remembrance of Things Past*, where the ordinary seductions of photographs are



Pécarrère, Pierre Emile Joseph.
Chartres.
The Metropolitan Museum of Art, Gilman Collection, Purchase, Anonymous Gift, 2005 (2005.100.37) Image © The Metropolitan Museum of Art.

a recurring motif. As a whole, however, the private cult of photographs was only the most visible aspect of a very general tendency of 19th-century culture to treat photographs as objects.

The case of paper prints obtained by the various negative-positive processes deserves special attention, because they were the most common kind of photographs after 1855, and because they would naturally seem to function more as images and less as objects. They too were nonetheless subject to the logic of objectification, partly because, like daguerreotypes, they remained rare and precious possessions, but partly also because they seemed almost too immaterial to function culturally without some sort of "hard" environment. First of all, finished prints of any quality were rarely left unmounted. As if a paper photograph had been too thin or too fragile an object to exist on its own, it was systematically mounted, usually on cardboard, but sometimes on wood or glass. The typical professional mount was not just a material base, but also functioned as a marker, serving to integrate the pictures in social and cultural networks. Very often mounts included the name and location of the studio or of the organization the photographer belonged to, as well as some decorative lining or frieze along the edges of the picture, while the back might present more information about the studio, quippings from the press, or advertisements for other businesses; in the case of commercial or archival views, captions and information about places would also be included. Large, deluxe, or specially significant prints would be framed and displayed, like daguerreotypes, while the more common photographs were kept in boxes and, of course, albums, which were sold by many specialized businesses. After 1855, the mass production of carte-de-visite portraits and stereographic views induced specific procedures of storage and display, and encouraged collecting and exchanging practices that spread quickly through the upper classes of society; the relative uniformity of formats and mounts was something like a standard, facilitating filing and circulation. The

very concept of the carte-de-visite as a kind of visual identity card engendered the related concept of the card album with slots of uniform size for sliding in cards, and by 1880 socially prominent families would often have collected enough cards to fill several of these 100- or 200-card albums. Similarly, the standardized format of stereoviews was intended to fit in popular stereoscopes and special boxes, which might typically hold fifty stereoviews, a number that is probably indicative of the extent of an ordinary stereo collection in a well-to-do urban household around 1875. Amateur photographic clubs developed in some cases as arenas for exchanging, comparing, and discussing stereoviews and other pictures; the same would be true, around 1900, for illustrated postcards, which in many ways continued the tradition of 19th-century photographic collections, while introducing photography into the realm of private correspondence. Finally, one of the more significant types of photographic object produced in the 19th-century was the photographically illustrated book, a category that actually covered a wide array of techniques and practices, from hand-made and hand-captioned single-copy photographic albums to full-fledged publications including photographic prints or, more commonly, photolithographs. Although photographic books are not the subject of this entry, it is worth mentioning here that the whole association of photography and paper, from William Henry Fox Talbot's research on, was geared precisely at making photographs that would be compatible with the space and economy of books and more generally printed matter, thus emphasizing their iconic, iconographic, and informational dimensions, as opposed to their materiality and their exhibition value as separate objects. At the same time, the urgency and difficulty of this association of photography with the book also hinted back at the resilient materiality of photographs, a factor one needs to take into account in order to understand more generally why so much of 19th-century photographic practice tended to treat photographs as objects.

One of the typical features of 19th-century photography is that it nourished the desire of producing a total illusion of reality—of replacing real things with images that were as life-like as possible—with a still primitive state of technology, which could only produce this illusion by resorting to and often paradoxically foregrounding its own infrastructure of objects, materials, and tools. Some of the more obvious examples of this paradox are panoramic photography, magnesium lighting, and especially photosculpture, a pre-holographic technique that was devised as early as the 1850s and that consisted of sculpting, with the help of a pantograph, from several photographs of a given subject taken at different angles. The three-dimensional illusion was more ordinarily realized after 1860 by stereophotography, and in this case also all the paraphernalia that surrounded the production as well as the contemplation of stereoviews functioned as a framework for the rapturous experience of seeing "solid pictures" or "sun sculptures." According to Oliver Wendell Holmes's famous dictum, with stereography "form is henceforth divorced from matter," and "matter as a visible object is of no great use any longer, except as the mould on which form is shaped" ("The Stereoscope and the Stereograph," 1859). The "mould," in this case, included the mounted cards and every aspect of their production, as well as the stereoscope itself, and the various implements used to store and transport the cards. Another striking illustration of photography's materiality is the fact that glass remained for much of the century, and into the 20th, the dominant base in negative-positive processes. The glass processes perpetuated preciousness, weight, and fragility as inherent characteristics of photography. Meanwhile, the unfeasibility of enlargements called for a scale of equipment, production space, and transportation that, with the increasingly large formats practiced by landscape photographers especially, could only emphasize the "hardware" aspect of the medium, and therefore its visibility as a technology, as opposed to its semantic and artistic dimensions. The materiality of photographs, however, was not just the result of technological constraints; rather, it should be seen as a cultural framework that governed much of the technological evolution itself, as is shown by countless 19th-century experiments on adapting photographs to virtually every type of base or surface, a spectacular example being the cyanotypes on cloth used by American home quilt-makers after 1880. Although "blueprint" quilts served memorial functions, it often seems that the production of photographic objects—i.e., the actual transformation of images into objects—was a goal in itself, beyond whatever social uses may have been intended. As a result, although photography as an abstract entity was called upon as a tool of truthful illustration, decoration, or commemoration, the very diverse objects it was produced with and applied to consistently advertised the parallel or parasite message of its own technicality and materiality.

After the realm of private practices, comparable observations may be made about many 19th-century institutional practices wherein the acquisition, accumulation, and conservation of photographic archives seem to have obeyed a self-justifying logic, whether or not actual utilitarian or documentary benefits can be ascribed to these archives. Strictly commercial interests, such as those of railroad companies and early tourist businesses, would justify investments in photography as a tool of illustrating landscape and thus promoting a firm's service. In the United States, the major railroad companies sometimes outfitted a special photographic car that served as an exhibition and sales room for views

of scenes along the way. Similar justifications can be adduced for the photo-sessions and group picture opportunities that started to appear after 1860 in organizations of every kind, from army regiments to school faculties, for which photography provided collective or corporate visual identities. At the same time, however, vast quantities of photographs were produced and accumulated with little ascribable justification under the aegis of armies, government agencies and other educational, scientific or medical organizations. Collections such as those of French and British expeditionary photography to the Middle East and the Far East, or those of U.S. surveys in the American West, are often loosely labeled "documentary." Yet beyond the general notion that they reflected colonial or strategic motivations, it is often hard to account precisely for their purpose, except by suggesting that the constitution of a photographic archive was a self-justifying practice, or a sign of modernity and technicality, which was as such suitable to illustrate the efficiency of the organization that produced it. Such archives were routinely described to budgeting authorities in terms of numbers of items secured, as opposed to informational content. Most of these photographic collections never reached the general public, or were only briefly and partially shown at exhibitions. In some cases, however, as with some of the U.S. federal surveys of the American West after 1865, photographs and especially stereographs were distributed or sold to the public, and special services were created to that effect, in response to an explicit public demand. Whether or not they were distributed, however, these large photographic collections induced procedures of archiving, cataloguing, serializing, captioning, describing, and in some cases publishing, which are historically significant as such, for they amounted to early systems of photographic documentation. Such documentary ventures contributed to making photography a customary adjunct to almost every undertaking of description, identification and analysis of visible phenomena, to the extent that around 1880 the photographic representation of many subjects had become an integral part of their cultural perception. This perception was often framed by and limited to one particular image which tended to function as an icon, as in the case of portraits of great historic figures (Queen Victoria, Napoleon III, Abraham Lincoln, Victor Hugo, etc.) that were also carried in engraved form by illustrated magazines and even reproduced as postage stamps. But it was no less common for photographic representation to emphasize accumulation, multiplicity, and seriality. Thus, the abstract concept of photography as an apparatus of truthfulness was enacted either through the treasuring of memorable icons or through the accumulation of many different views, but both practices reflected an aspiration to obtain total depiction of the visible world.

Yet for a variety of reasons, one of them being that no single photograph or collection of photographs could produce the total view that the idea of photography seemed to promise, many 19th-century photographic practices embodied the opposite assumption that photographs as such were incomplete messages, semantically deficient, particularly because lacking in context. The photographically illustrated book was only one major example of practical and discursive apparatuses that served to endow photographs with meaning, and which consistently surrounded the apparition of photographs in social life. Mounts with imprinted serial numbers, captions, and decorative motifs, and the ideal picture collections that they referred to, were more common manifestations of a general practice (which in fact predated photography) of anchoring visual messages in textual and more generally cultural contexts. Thus, the scope of large-scale institutional ventures such as the expeditionary photography campaigns already mentioned could only be legitimized by ascribing the thousands of photographs gathered to didactic, memorial or scientific purposes, even though as noted above the mere achievement of these large collections appears to have served as de facto justification in many cases. In these large-scale documentary ventures, pictures were often made or presented in serial form (for instance in albums, sets of stereoviews, or descriptive catalogues that were used for marketing prints), emphasizing a requirement for descriptive exhaustiveness that nonetheless remained a utopia. Many procedures of photographic description, such as multi-plate panoramas and grouped views of the same subject from different angles, answered the same concern for a totalizing depiction, while at the same time acknowledging failure to achieve it and denying the sense of self-containment that would, in the 20th century, be associated with a great photograph. In more specialized uses such as police and medical records, the specific methodologies of picture-taking, filing, and comparison that were devised in the late 19th century aimed at bringing out clues or signs that photographs of a more lay kind, or considered in isolation, would not convey. Meanwhile, in many ethnophotographic collections the actual documentary content was largely if not exclusively a function of captioning and commentary. Exhibitions of photographs, especially in the context of world fairs, often grouped them by process and then by topic or geographical area, rather than by author or style, and thus they interpreted pictures not on formal or even strictly technical grounds but in relation to what they represented, and to what in 20th century art-historical terms would be considered external categories. It should also be remembered that for most of the 19th century photographs were structurally incomplete with respect to the printed media, which could not incorporate them

without transferring them into some printable form. 19th-century photographs had little or no public life in their original photographic appearance (except on stereocards), and instead they were reproduced in engraved or lithographed versions that more often than not, and even with semi-automated processes, transformed the visual message and impregnated it with specific intentions. Conversely, this technical incompleteness also meant that photographs were like raw materials, usable for any purpose, and transferable onto any base, from chromolithographs to magazine engravings to postage stamps. Finally, it is known that an artistic echo to these technical procedures was found in the practice of many painters, sculptors and even writers, who (whether or not they welcomed photography amid the sphere of art) used photographs as studies or preliminary sketches, i.e., as documents that were at the same time deficient as works of art and useful (sometimes even essential) to the creation of works of art.

In sum, the diversity, ingenuity and intensity of 19th-century photographic practices may reflect, in part, the primitive state of a technology that did not yet lend itself quite so easily to the universal uses that it seemed destined to fill. More fundamentally, however, these practices registered the oscillation of 19th-century culture between a fascination that led people to magnify and sometimes to multiply the brilliant realism of photographic images, and a reticence, or perhaps a mere lack of familiarity with the workings of photography, which caused attitudes of restraint and an urge to control or frame its power.

FRANÇOIS BRUNET

See also: Daguerreotype; Tintype (Ferrotype, Melainotype); Brady, Mathew B.; Cartes-de-Visite; Amateur Photographers, Camera Clubs, and Societies; Books Illustrated with Photographs; Talbot, William Henry Fox; Victoria, Queen and Albert, Prince Consort; and Hugo, Charles and François-Victor.

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PHOTOGRAPHIC RETAILING

From the outset, the emerging profession of photography had two distinct but associated requirements—a market place for pictures and a source of equipment and materials. Thus a photographic retail marketplace emerged catering for both requirements—outlets for the supply of the latest in equipment and chemistry, and a shop window for the photographs themselves.

Many early retailers of photographic equipment were optical instrument makers—the Parisians Charles and Vincent Chevalier made Daguerre's first experimental cameras, while Alphonse Giroux et Cie manufactured and marketed the first commercially produced daguerreotype outfits in 1839. The absence of any patent control over the design of daguerreotype cameras, however, meant that within a very few years other French manufacturers—including Chevalier and Nöel Marie Paymal Lerebours—were producing and marketing almost identical instruments at prices much lower than Giroux's original 600 franc outfit. Giroux reportedly sold all his original production run of outfits within the first few days after Daguerre's announcement of the process. That the inventor and a manufacturer/retailer should work so closely together at the dawn of a new medium may seem surprising, but Daguerre was always convinced of the success of his invention, and Giroux was related to Daguerre's wife.

Giroux had pre-sold a number of camera outfits to Berlin art-dealer Louis Sachse who had intended to become Germany's first recorded photographic retailer. He retained one of the outfits for his own use. Gernsheim (1982) recounts that, in the event, there was a delay before Sachse could sell the cameras, and was beaten to the market place by a few days by nearby optician Theodor Dörffel who had manufactured his own apparatus, and significantly undercut the Giroux/Sachse price. Dörffel's outfit—but without a lens as these were in very short supply—went on sale on 15th September 1839.

The Giroux camera was the first to be marketed and used in many European countries—at least two thousand are believed to have been sold—but was very quickly copied locally, the replicas and later improvements driving prices down by the dawn of the 1840s. The names of many of these early entrepreneurial retailers have not been preserved.

In Great Britain, J.T. Cooper, a London chemist with premises at the Royal Institution became the first person to retail papers for William Henry Fox Talbot's photogenic drawing process—with a month of Talbot's announcement of his discovery on January 31, 1839—while Ackermann & Co, a print-seller with premises at 96 Strand, London, became the first supplier in Britain to retail a complete outfit for making photogenic drawings, at a cost of one guinea. Additional supplies of paper could be purchased separately for two shillings.

In London, the business of Horne & Thornthwaite first emerged about 1841, becoming Horne, Thornthwaite & Wood from 1844, developing into a major force in photographic retailing in England, both through their premises in London, and, from the mid 1850s, through extensive advertising in the emerging photographic press.

By the mid 1840s, Richard Willats, a chemist and optician, was importing Lerebours' cameras from France into Great Britain, and even working with the French manufacturer—suggesting modifications and improvements to the design. Within a few years, the firm of T & R Willats became one of London's leading retailers of photographic materials and equipment, and the publisher of both original, and English translations of, several pivotally important early photographic manuals.

In London, one of Willats' major rivals in the photographic market place, George Knight & Sons, also published instruction manuals as well as supplying materials.

The back pages of instruction manuals often carried advertisements for the leading retailers of the day—offering the photographer a ready directory for everything photographic. Thus, for example, at the back of the 1855 edition of Philip Delamotte's *Manual of Photography*, Andrew Ross offered a wide range of cameras and lenses from his Holborn premises, as well as papers and chemicals; Horne & Thornthwaite invited readers to send for their catalogue; Dinneford & Co listed all the necessary chemicals for the preparation of wet collodion, and waxed paper; Halifax and Co. of Oxford Street, and Howard George Wood of Cheapside both offered a range of British and French papers; and Knight & Sons advertised Voigtländer's lenses.

In Manchester, England, John Joseph Pyne, originally a chemist, opened his first 'Photographic Depot' in the mid 1850s, retailing equipment and 'photographic materials from France, Germany, and America.

It is an interesting feature of early British photographic advertising that foreign goods were sold as if they had a certain advantage over locally produced equipment and materials—in London, photographer J.J.E. Mayall originally advertised his studio as the American Daguerreotype Gallery, while in Liverpool, John Atkinson advertised heavily the imported equipment and materials available from Atkinson's American Photographic Stores. Atkinson imported Scovill products—for which he was the sole English agent in the 1850s, Peck's union cases. Skelling's American Ambrotype Varnish, and 'American cases, matts and preservers in a hundred varieties' as well as a range of French products including Jamin-Darlot camera lenses.

American retailers were similarly heavy in their promotion of British and especially French products.

In America, the most notable pioneers in photographic retailing included the Scovill Manufacturing Company which had started retailing daguerreotype plates in the closing weeks of 1839, and Edward Anthony, who opened his first studio in New York in 1841 selling daguerreian apparatus and supplies as well as taking portraits. By 1846 Scovill had established a large retail outlet in New York and reportedly had become the largest manufacturer and retailer of daguerreotype plates in America. In 1847 Anthony moved exclusively into manufacture and retailing and, in 1854, published the most comprehensive catalogue of photographic equipment and materials yet produced.

Anthony's *Comprehensive and Systematic Catalogue of Photographic Apparatus and Materials, Manufactured, Imported and Sold* was prefaced with the promise that "Those who purchase of him do so from the original manufacturer, and not at second hand, or from a jobber." Not strictly true, of course, as Anthony sold a wide range of imported goods for which he was not the manufacturer—including cameras by Chevalier and by Voigtländer, blue skylight glasses, and leather daguerreotype cases from France and Great Britain.

By the early 1860s, the expanding retail market for photographic equipment and materials in New York City was dominated by four companies—Scovill, Anthony, Holmes Booth & Hayden, and J. W. Willard & Co. But there were many more retailers—the advertising at the back of the John Towler's 1864 manual *The Silver Sunbeam* occupied almost thirty pages, and demonstrated just how competitive the market place had become.

With the advent of dry plates, and of manufacturers producing plates and papers commercially, a separation gradually occurred between manufacturers and retailers, and by the late 1870s, the idea of the photography shop—destined to become a familiar sight in every town as a one-stop source of everything needed to practice either as an amateur or professional—had been established.

Early retailers of photographic images included George Lovejoy's bookshop and library in Reading, England, where images by Henry Fox Talbot and Nikolaas Henneman were sold in the 1840s.

For many years, the print shop, the bookshop and the stationers was the most usual outlet for photographs. As people travelled throughout Europe and the Americas, specialist shops, often set up by the photographers themselves, were opened to cater for the demand for photographs fuelled by a growth in tourism. The route of the Grand Tours of Europe included many locations where large format images could be purchased, and when touring in the Middle East became popular, retail premises appeared along the banks of the Nile, amongst them outlets for the works of the Félix and Adrien Bonfils, the Zangaki Brothers, Antonio Beato, Pascal Sebah and others.

Bookshops along both European and Middle Eastern tourist routes increasingly catered for the well-off visitor, with expensively produced albums of photographs. Photographically illustrated albums, as well as single unmounted prints, of such locations as Florence, Pompei, and Rome in Italy, the architectural treasures of Ancient Greece, and the treasures of the Nile were all available by the late 1850s. Italian photographers such as Alinari, and Brogi, both in Florence, catered for the art lover, selling both large format prints and cartes-de-visite of the treasures of Italy's most famous cities and galleries.

In America, as the country was opened up to tourists, the same pattern emerged, with souvenir photo booths opening at all the major attractions. One of the first was at Niagara Falls, where in the early 1850s, Platt D. Babbitt established an outdoor facility, photographing visitors against the dramatic backdrop of the Falls, but also selling 'off the shelf' scenic views as well.

When the Crystal Palace building was removed from the Hyde Park site in London and rebuilt at Sydenham, photographers Negretti & Zambra opened a retail outlet within the building for photographic souvenirs of a visit to the exhibition complex. By 1855, and the opening of the Exposition Universelle in Paris, the idea of selling photographic souvenirs at exhibition sites was well established, and Parisian photographer André Adolphe Eugène Disdéri formed a company specifically and exclusively to make and retail souvenir photographs—daguerreotypes, stereo daguerreotypes and paper prints.

Subsequent exhibitions and world fairs all had a photographic franchise, selling souvenirs of the visit, a pattern which continue past the end of the century to this day.

By the mid 1850s, the distribution of the finest images from several of the leading photographers of the day was already being handled by well-established art dealers. In London, P & D Colnaghi had established themselves as early promoters of photography, and with Thomas Agnew of Manchester co-marketed Roger Fenton's Crimean War photographs in Great Britain. Those same images were distributed and marketed in New York by Williams & Co., and in France by Parisian photographer and print-seller, Félix-Jacques-Antoine Moulin, from his premises at 23 Rue Richer.

Colnaghi's entry into the photographic retail market was belatedly reported in *The Art Journal* in 1857, which reported:

> In addition to the other departments of their extensive and very complete establishment, Messrs P. and D. Colnaghi have just completed the requisite arrangements for the productions of photographs of the highest class and of the largest size and also in every possible vartiety. We have been able to examine many of these photographs and their excellence justifies our pronouncing their appearance as a new era in art.

Colnaghi also handled the distribution and marketing of some of Fenton's photographs of the treasures of the British Museum, but in his business dealings with the museum authorities in the 1850s, Fenton introduced a number of innovative marketing approaches, including an agreement to produce negatives without charge in return for the right to sell prints himself, made after the museum's orders had been fulfilled. This culminated in the establishment of a sale kiosk in the museum foyer, where images were sold to the visiting public by Fenton's staff. The success of this venture, in addition to substantial print orders from the museum trustees themselves, kept a number of staff at Fenton's printing establishment occupied.

They later also marketed many of the works of Julia Margaret Cameron, both in large format prints, and in the increasingly popular carte-de-visite size.

The popularity of the carte-de-visite and the stereoscope turned even relatively small photographic portrait studios into retail establishments, with the rise of the album fuelling demand for images from the catalogues of leading producers such as Mayall, the London Stereoscopic Company, Nadar, and others. E.H.&T.Anthony also became distributors of cartes, with their catalogues being retailed from studio outlets throughout America and Europe.

Many studios stocked and retailed portraits of European royalty, American presidents, stars of stage and music hall, and other celebrities.

With poor copyright protection for photographs, however, many of the sales thus achieved did not benefit the original photographers, with copies rather than originals being offered for sale. One of the first to establish what is now recognised as 'image rights' and thus benefit financially from the sale of his 'likeness,' was Tom Thumb, who controlled the marketing of pictures of himself and his family.

For much of the 19th century, the photographic exhibition served as a successful retail outlet for images, with exhibition catalogues from the early 1850s giving a price for each image on display.

By the early 20th century, however, the retail market for photographic images had largely been transferred to the picture postcard.

JOHN HANNAVY

See also: Agnew, Thomas, and Sons; Alinari, Fratelli; Anthony, Edward, and Henry Tiebout; Babbitt, Platt D.; Beato, Antonio; Bonfils, Fèlix, Marie-Lydie Cabanis, and Adrien; Brogi, Giacomo, Carlo and Alfredo; Cameron, Julia Margaret; Colnaghi; Daguerre, Louis-Jacques-Mandé; Disdéri, André-Adolphe-Eugène; Fenton, Roger; Giroux, André; Henneman, Nicolaas; Horne and Thornthwaite; Lemercier, Lerebours & Bareswill; Mayall, John

Jabez Edwin; Moulin, Félix-Jacques-Antoine; Scovill and Adams; Sebah, J. Pascal and Joaillier; Talbot, William Henry Fox; and Zangaki Brothers.

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PHOTOGRAPHISCHE CORRESPONDENZ

Between 1888 and 1938, the *Photographische Correspondenz* undoubtedly was the most renowned magazine in photographic sciences. Any invention or scientific photographic progress mentioned in this magazine meant that it was a validated device or process. This was due in part because of its behind the scenes editor Joseph Maria Eder, then the foremost source and teacher in photographic sciences to the degree that the quality of this paper's articles had a canonic character. Before publication, any method offered, process introduced, or industrial operation presented was tested by Eder in his laboratories at the Viennese Hoehere Graphische Lehr- und Versuchsanstalt [Higher Institute of Graphic Arts and Reproduction Technology] which he founded in 1888. The shift of the magazine into photographic science was not only due to his influence but to the competition of a number of other magazines, too, which also concentrated on the publication of Fine Art imagery.

Photographische Correspondenz started in 1864 as a periodical from practitioners to practitioners. The first editor, Ludwig Schrank organized exhibitions and wrote papers for an equally sound practice in economy and arts. Fixed to ideals of craftmenship, the magazine focused on composition, lighting, posing, and the different genres of photography. Fine Art was discussed in its practical aspects, from the discussion of printing processes to questions of the copyright for photographs. From 1888 on, not only the contents of the papers changed but the illustrations and photographers as well. Any important scientist in the German speaking world who something to contribute about photography did it in *Photographische Correspondenz*, from the archeologist Heinrich Schliemann to the physicist Ernst Mach, and a number of other unnamed astronomists. The quality of these articles culminated in the first decade of the 20th century when Theodor Scheimpflug and others published their researches for the first time in Photographische Correspondenz.

Portrait photography in the studio was the main interest of the editors and authors in the first decades of *Photographische Correspondenz.* Printing technology seemed to be the main concern in the years to follow mirroring itself in the prints accompanying the periodical itself: After 1888, most of the images were produced in Eder's school, and often new technologies of both lithographic and autotype processes were used for one issue or another. The experimental characteristic of the print preparation allowed for artistic experiments o, and therefore a number of important Fine Art photographers published their works in *Photographische Correspondenz* like Hugo Henneberg, Wilhelm von Gloeden, Heinrich Bachmann, Robert Demachy, Hugo Erfurth, Hermann Clemens Kosel, and Fred Boissonas. The contrast of the scientific approach in the articles, a bourgeois habitus in the news, and a slow approval of aesthetic developments mark the overall appearance of this magazine.

Undoubtedly too, *Photographische Correspondenz* had a number of strong competitors in the world, and in German language as well: The *Photographische Rundschau*, under direction of Richard Neuhauss, mostly managed to publish international articles in German translation earlier than *Photographische Correspondenz*, and from 1900 onwards there were a number of good periodicals exclusively devoted to Fine Art Photography, which surpassed *Photographische Correspondenz* in aesthetic quality by far. But there was no other magazine in German language that had the earliest news of scientific developments, than *Photographische Correspondenz.*

ROLF SACHSSE

See also: Eder, Joseph Maria; Schrank, Ludwig; Mach, Ernst; von Gloeden, Baron Wilhelm; Demachy, (Léon) Robert; Photographische Rundschau; and Neuhauss, Richard.

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dir. Wilhelm J. Burger; no number in 1923; from vol. 62, 1926, subtitled as *Zeitschrift für wissenschaftliche und angewandte Photographie und die gesamte Reproduktionstechnik*, edited by Adolf Schirtlich; from vol.77, 1941 edited by Othmar Helwich; vol. 81, 1945, vol. 107, 1971, dir. Othmar Helwich.
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Otto Hochreiter, Timm Starl (ed.), *Exh.cat. Der zweite Eindruck, Bildbeigaben der Photographischen Correspondenz 1864–1971*, Österreichisches Fotoarchiv im Museum Moderner Kunst, Wien 1984.

PHOTOGRAPHISCHE RUNDSCHAU

The magazine *Photographische Rundschau* was launched in Vienna in 1887. Its subtitle read 'Centralblatt fuer Amateurphotographie. Organ des Club der "Amateur-Photographen" in Wien' and displayed clearly the aims of this new addition to the world of photographic periodicals. The *Photographische Rundschau* was among the earliest magazines specifically produced for amateurs, for non-specialists in both art and science. The first editors of the periodical were Carl Srna and Carl Schiendl, who was replaced from issue No. 5 by Charles Scolik, then a well-known author on photography.

With the second year the *Photographische Rundschau* moved from Vienna to Halle on Saale, to the publishing house of Wilhelm Knapp, one of the first specialists in photography. With volume 8, 1894, the magazine not only changed the title—*Photographie Rundschau. Zeitschrift fuer Freunde der Photographie*—and its editorship but shifted towards a broader understanding of photography at all. Richard Neuhauss, the new editor, was a renowned scientist in photo chemistry but had firm roots in the fine art photography movement as well. The publication now was lavishly illustrated with at least four pages of perfect prints in different techniques, mostly phototypes or heliotypes, often enough even three-colour prints.

With volume 19, 1905, the magazine was united with *Photographisches Centralblatt* from Vienna but kept its subtitle and hosted a trifolium of editors: Richard Neuhauss, Fritz Matthies-Masuren and Hermann Schnauss. Fritz Matthies-Masuren was a painter and fine-art photographer, and as an art critic he gained enourmous influence on the German scene short before World War I. In 1907, Neuhauss vanished from editorship in favour of Robert Luther, and Schnauss was replaced by Otto Mente; both were lecturers in photo-chemistry and gave the magazine a more scientific note. By 1912, volume 26 of the *Photographische Rundschau* was united with volume 49 of the *Photographische Mitteilungen* to become *Photographische Rundschau und Mitteilungen* as which it was published for the next 32 years (and counted as the older one). If one credits the later magazine *Fotografie*—the official GDR publication in amateur photography—as the subsequent follower of the earlier periodical, the *Photographische Rundschau* has existed for exactly 103 years, up to 1990.

The long history and the number of changing editors set light to the social role the *Photographische Rundschau* played. It was the earliest amateur periodical in German language but it contained larger parts of scientific news as well as messages from clubs and congregations. The main reason to subscribe this magazine, at least after 1894, was its perfect illustration with photographs from masters of the art. Later, there were more luxuriously illustrated periodicals like the *Sonne* or the *Kunst in der Photographie*, but it was the *Photographische Rundschau* where young followers of the art could see images by important professionals. Accompanied by lengthy debates on the pros and cons of printing processes, by long critical essays on exhibitions and contests, the magazine secured its reader with the information necessary to take part in most of the photographic affairs in Germany.

And the *Photographische Rundschau* even set sails for one phrase, maybe by incident: In August 1905, the Belgium fine art photographer Alexandre published an image in this magazine, showing a number of soldiers on horses in a hollow valley, under the title 'Avantgarde im Hohlweg' (Avantgarde in the defile). Six years before Guilleaume Apollinaire's first use of the word avantgarde in the context of fine art, the *Photographische Rundschau* seems to have contributed to the critic's vocabulary.

ROLF SACHSSE

PHOTOGRAPHS OF THE GEMS OF THE ART TREASURES EXHIBITION (MANCHESTER, 1857)

A major concern of mid-Victorian Britain was the relationship between art and industry. One of the key movements in this debate was The Exhibition of the Art Treasures of the United Kingdom held in Manchester in 1857. The site of the exhibition was the Manchester Cricket Club's ground at Old Trafford. It was opened by Prince Albert on the 5th May 1857 in the presence of Queen Victoria, remaining open for 142 days and closing on the 17th October that year. In retrospect, this exhibition was one of the most spectacular art exhibitions of the nineteenth century.

At the time, Manchester was at the centre of Britain's industrial heartland. A French social commentator of the period on visiting the great mill town of Manchester in 1835 was appalled by what he found: 'A sort of black smoke covers the city…. Under this half-daylight 500,000 human beings are ceaselessly at work…. From the foul drain, the greatest stream of human industry flows out to fertilise the world.' (*Journeys to England and Ireland*, 1835).

The main exhibition hall was a vast iron and glass

structure not unlike a railway shed with a decorative brick façade designed by local architect Edward Salomons. Inside, the walls and ribs of the galleries were decorated by the firm of Crace of London and each column bore the gilt monogram of the show: 'ATE.' The main hall was flanked by two picture galleries while the whole layout resembled a cathedral with a transept and a massive organ at the far end. Watercolours and photographs were displayed on a balcony, and the Indian collections were tucked into a gallery on one side of the organ.

The exhibition brought together some sixteen thousand works of art, including paintings by Duccio, Michelangelo and Rembrandt, Renaissance maiolica and glass, medieval metalwork, treasures from the English East India Company, as well as modern sculpture, paintings, watercolours and photographs. The organisers used three compelling arguments to persuade lenders: the idea of educating the masses, the promotion of British wealth, and the ultimate incentive, royal patronage.

Photography was represented by 597 examples of which 247 were portraits. It included the work of such names as Francis Bedford, Roger Fenton, Gustave Le Gray, John Dillwyn Llewelyn, John Mayall and William Lake Price. Oscar Rejlander's *Two Ways of Life* was hung at the exhibition and a print purchased by Queen Victoria for Prince Albert. Contributing photographers from the Manchester area included James & Robert Mudd and Alfred Brothers.

In 1853 Philip H. Delamotte recorded the various stages in the reconstruction of the Crystal Palace at Sydenham and photographed the Royal Family there in 1854 and 1855. Delamotte was later awarded the photographic rights for The Exhibition of Art Treasures. Alfred Brothers was asked by the Manchester print dealer Thomas Agnew to take photographs of the opening of the exhibition that was attended by Queen Victoria and other members of the Royal Family.

More than one million visitors came by road or rail to the Old Trafford site. On a single day the show was seen by the Duke of Wellington, the Bishop of Oxford, Florence Nightingale and the painter David Roberts. The exhibition gave hundreds of thousands of working-class Victorians a glimpse of a world beyond the factory and the pub. For many, 1857 marked the start of 'a noble era in which Art took Industry by the hand, and gave her all she needed to command the world' (*The Art-Treasures Examiner*, 2).

MICHAEL HALLETT

See also: Albert, Josef; Bedford, Francis; Fenton, Roger; Le Gray, Gustave; Llewelyn, John Dillwyn; Mayall, John Jabez Edwin; Price, William Lake; Rejlander, Oscar Gustav; Delamotte, Philip Henry; and Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851).

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A walk through the Art-Treasures Exhibition at Manchester under the Guidance of Dr. Waagen. A Companion of the Official Catalogue, London, 1857.

PHOTOGRAPHY AND REPRODUCTION

While photography can be defined as a reprographic process, and thus all images created are reproductions, one of the great applications of the medium during the second half of the 19th century was in the reproduction of manufactured objects and aspects of the natural world and its phenomena.

Photography redefined the concept of facsimile and objectivity throughout the second half of the 19th century and the medium was exploited across a wide range of applications where accurate reproduction was required. In order to achieve this, photography needed to overcome a number of technical barriers. The first was the ability to reproduce fine linear detail and replicate tonal ranges in order for a monochromatic photographic image to 'look like' an original subject. The other challenge was to act as an intermediary to capture and then reproduce colour in printed form. Both of these were achieved in a number of stages during the 19th century though it was the 20th century that saw their eventual full flowering.

The 19th century saw photography become fully integrated and inextricably linked to 'ink on paper' printing. Photographic illustration accompanying printed text had started as early as 1840 with the five photomechanical heliogravures in Berres' *Phototyp nach der Erfindung des Prof. Berres in Wien.* By the end of the century photography—largely through industrialized photomechanical processes—was illustrating publications distributed across the entirety of human activity. Thus photography distributed the reproduced world through a number of channels; as loose photographic prints in a wide variety of formats; as photomechanical prints and as illustration to printed texts.

Photographic formats included the stereoscopic view, and the lantern slide, both modifications to existing technology. Sir David Brewster (1781–1868) invented the first practical stereoscopic camera in 1849 and this '3-D' format quickly became popular, being used to reproduce subjects including topographical views, sculpture, architecture and sets of genre scenes representing stories depicted through pictorial narratives. Current events such as wars, and natural disasters including floods, fires, train-wrecks, and earthquakes were enormously

popular subjects and distributed through international networks. The format was commercially exploited well into the 20th century.

William and Frederick Langenheim of Philadelphia patented their photographic lantern slide process in 1850 and called it the 'Hyalotype.' This photographic format had enormous impact both as a form of entertainment and for learning. The dual projection of 'slides' was exploited by 19th century art historians to form a cornerstone of the discipline's 'comparative' methodology. Both this and the stereoscopic format were pivotal moments in the development of visual perception.

The reproduction of two-dimensional graphic art encapsulated a number of the dimensions of 19th century photography. This ranged from engineering, architectural and technical drawings and maps through fine art engravings and old printed texts, to oil paintings. Photography was also used to reproduce itself, as in the case of photographic copies of unique Daguerreotypes. Another dimension here was the rise form the 1860s of photographic 'piracy.'

Photography was applied to technical drawings in fields such as architecture and civil engineering. By 1847 the engineer Isambard Kingdom Brunel (1806–1859) was using the Daguerreotype for professional purposes. He sent Daguerrotypes of his engineering drawings to prospective railway builders across Europe. By the 1850s Brunel was using photography as a contractual tool during the construction of his vast ship the *Great Eastern,* built at the yard of John Scott Russell (1808–1882) at Millwall on the River Thames. From the 1860s most major civil engineering projects were being documented photographically. By the 1870s there was wide spread use of photolithography to reproduce architect's and engineer's drawings.

Photolithography was also used to reproduce important historical texts ranging from Shakespeare's original folios to William Griggs's 1871 reproduction of the Mahabhasya (an authority on Sanskrit grammar), consisting of some 4674 pages. This was carried out for £6000 less than the estimate for a manual tracing of the original manuscript. Between 1899 and 1903 Griggs produced the sixty plates for one of the landmarks of 19th century colour photolithography, George F. Warner's *Illuminated manuscripts in the British Museum.* Such applications underline aspects of photography's role in 19th century scholarship.

The use of photography to reproduce maps became well established by the 1860s. In the late 1850s Colonel Sir Henry James, (1803–1877) director of the Ordnance Survey Office in Southampton, introduced his photoplanographic process called Photozincography. The function of the Ordnance Survey and the politics involved in its funding dictated that the primary application of this process lay in its reproduction of maps. James regularly pointed out that Photozincography reduced the cost of map making by several thousand pounds a year. However, James also used Photozincography to reproduce historical and illuminated manuscripts in the British national collections, the chief example of which was the 11th century Domesday Book published by the Ordnance Survey Office between 1861 and 1863.

Both Daguerre and Talbot considered the reproduction of the fine and decorative arts and architecture a key application for their respective photographic processes. Talbot's experiments in particular covered a wide range of the fine and decorative arts. From engravings, printed texts and paintings, through porcelain, glass to sculpture. These subject matter were used within his landmark publication *The Pencil of Nature* (1844–1846).

Technical innovation in 19th century photography was also connected with a number of reproductive applications of the medium. For instance, the limited spectral sensitivity of photographic emulsions caused problems for the reproduction of polychrome objects such as oil paintings. In the late 1870s Gaston Braun (1845–1923), the son of the great photographic publisher Adolphe Braun (1812–1877) of Dornach, exploited developments in photochemistry to create orthochromatic collodion-bath plates to reproduce paintings in the Prado Museum, Madrid and the Hermitage, St Petersburg. These photographs caused considerable astonishment in the photographic and art world but since Braun kept completely silent about his system, it could not be adopted by other companies, thus permitting Braun et Cie to achieve pre-eminence in this specialised field However, orthochromatic (also known as isochromatic) film was not sensitive to the entire visible spectrum and it was not until 1902 that Professor Adolph Miethe and Dr Arthur Traube, of the technical college in Berlin-Charlottenburg, discovered that by using a red-violet dye, subsequently called 'ethyl-red,' it was possible to produce truly panchromatic plates and thus to correctly register in monochrome the colours of the visible spectrum in their proper tonal relationships.

The principles of colour photography had been largely established by James Clerk Maxwell (1831–1879) in the 1860s. Charles Cros (1842–82), another pivotal figure in the history of colour photography, produced colour photographs of paintings by the entrepreneurial and controversial avant-garde artist Edouard Manet (1832–83). One of these photographs was used by the collector of Impressionist art Ernest Hoschedé (1837–1891) for the cover of his review *Impressions de mon voyage au Salon de 1882* (A. Tolmer, Paris, 1882). However, during the 19th century the use of photographic colour reproductions were frequently the result of a combination of photographic and manual processes. One of the more complex of these 'hybrid' processes was the *photochromie* of Léon Vidal (1834–1906), which combined chromolithography

and the Woodburytype photomechanical process. Since Vidal primarily reproduced works of fine and decorative art —rather than scenes from nature—it was difficult for the observer to determine the resulting accuracy.

Throughout the 19th century, the manual transcription of photographic originals to form a variety of graphic illustrations to place. This to a degree masks the medium's impact. While the *Illustrated London News* prominently credited those illustrations that were after photographs, other publications did not. One of the primary reasons for manual transcription was one of speed and cost. Publications working within strict timescales exploited cheap labour to create graphic illustrations based on photographs. The rise of photomechanical processes—particularly during the 1870s—greatly increased photographic reproduction during the last two decades of the 19th century. However, it is not always easy to identify such productions. Simple line drawing illustrations were frequently not credited as being produced by photomechanical processes. At the other extreme, from the early 1870s the French engraver Amand Durand (1831–1905) produced a series of 'facsimile' heliogravures of drawings, etchings and engravings by the Old Masters which were so accurate that it was reported that a 'distinguishing mark' had been placed next to his 'deceptive copies.'

Photographic reproduction was applied to a number of areas of 19th century science. Light and colour theory and astronomy were greatly aided by the introduction of photometry and the work of William de Wiveleslie Abney (1844–1920).

Medical photography provided the capability to document and reproduce diseases, abnormalities and clinical conditions. These ranged from such as diseases of the skin, through surgical procedures to Dr Hugh Welch Diamond's photographs of the insane—taken from the late 1840s- that were also used to develop diagnostic techniques. Photographs frequently were transcribed into engraved medical illustrations. Thousands of photographs of pathological specimens and soldiers wounded in the American Civil War were used to provide illustrations for monumental six volume *The Medical and Surgical History of the War of the Rebellion* published in Washington, D.C., between 1870 and 1888.

The second half of the 19th century saw an explosion in scholarship in every conceivable academic discipline. Numerous societies and institutions were formed to represent these interests, whether in a professional and amateur capacity. Many of these not only formed photographic collections but also encouraged the photographic reproduction of pertinent objects and artefacts. In some instances 19th century local history and architectural societies joined with photographic societies to achieve their aims. The publications of these societies and illustrations were another channel by which photographic reproduction had a major influence on the dissemination of knowledge and the promotion of scholarship.

In the autumn of 1839 John Benjamin Dancer (1812–1887) made the first microphotograph on a Daguerrotype plate at 160X reduction. Photomicrography became increasingly used in the second half of the 19th century in fields such as botany and entomology. During the Franco-Prussian War of 1870, the microphotographs of the Frenchman Prudent René-Patrice Dagron (1819–1900) were exploited to provide a mail service to and from Paris while the city was under siege. Some 115,000 messages were allegedly transmitted in this way. Such uses also formed the early use of microphotography for purposes of spying and transmitting illicit messages, an application suggested by Dancer in the mid 1850s. In the 1880s Robert Koch (1843–1910) made microphotography a central tool of bacteriology. During the 20th century the microfilm became a key technology to distribute information and knowledge.

By the end of the 19th century, photography and photomechanical processes had largely eliminated the requirement for labour intensive manual printmaking methods for the production of utilitarian botanical illustrations. Related to this is the matter of the change in contexts. In the 1880s, the Harvard botanist Asa Gray (1810–1888) purchased large photographic prints taken by Carleton Watkins (1829–1916) on a California State Geological Survey, to augment the Gray Herbarium. Gray formerly acquired these images as botanical illustration, though today Watkins' images are primarily viewed within the context of their aesthetic value.

Photography was used to document manufactures and produce in-house records or advertising materials and illustrated catalogue for a wide range of industries. By the early 1860s photos replaced drawings in the china manufacturer Minton company pattern books. From the 1870s the Baldwin Locomotive Works of Philadelphia began publishing photographically illustrated catalogues.

During the last third of the 19th century photography began to have a significant commercial impact on the various components of the industry. The construction industry the works of architects, architectural masons, manufacturers of decorative fixtures and fittings, etc. were all photographically reproduced. In 1872, a critic writing on the industrial results of photography pointed to the savings being made through the efficient use of photography. "Does a builder require a number of metal brackets from Birmingham? Instead of having to incur the delay and expense of attending the transmission of a specimen from the manufacturer, he receives by return of post a photograph of the article wanted, and gives his order accordingly."

ANTHONY HAMBER

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PHOTOGRAPHY AS A PROFESSION

The professional exploitation of photography came about surprisingly quickly after the daguerreotype became a practical proposition. The era of the professional began in the early 1840s with a few operators producing high price images for an elite few. The nineteenth century ended with photography as a major employer catering for a mass market, and with professional photographers establishing collectives and associations to protect their interests.

Those first sixty years of professional photography were punctuated with major 'firsts' and with the profession generating and nurturing most of the applications of the new medium which are taken for granted today. During that time, many thousands of photographic studios opened their doors. Very few of them survived for any length of time as a result of fierce competition, falling prices and a lack of business acumen.

The first photographers were, predominantly, artists and scientists who explored the potential of the medium out of curiosity and fascination. It was not until exposure times were reduced sufficiently to make portraiture a practical proposition that the photographic studio evolved. That the daguerreotypist could do in a few minutes what had taken the miniature painter hours or even days to complete immediately caught the imagination of those able to pay the not inconsiderable cost of having their likenesses made.

The dawn of professional photography in the United States was marked as 1840, and the New York *Sun* carried an account of the opening by Alexander S Wolcott and John Johnson of the world's first professional photographic studio on March 4:

> Sun Drawn Miniatures.– Mr A. S. Wolcott, No.52 First Street, has introduced an improvement on the daguerreotype, by which he is enabled to execute miniatures, with an accuracy as perfect as nature itself, in the short space of three to five minutes. We have seen one, taken on Monday, when the state of the atmosphere was far from favourable, the fidelity of which is truly astonishing. The miniatures are taken on silver plate, and enclosed in bronze cases, for the low price of three dollars for single ones.

This is believed to be the earliest publication of the cost of having a daguerreotype portrait taken professionally. Three dollars represented a week's earnings for the majority of Americans, clearly placing the daguerreotype in the same social stratum as the miniature painting.

The first photographic studio to be opened in France is believed to have been that of Nicholas-Marie Paymal Lerebours, which opened in late spring 1841. He had sold daguerreian equipment from his optical instrument shop at 13 place du pont-neuf in Paris, since taking over the business from his father in 1839. During his first year as a professional photographer he is reported as having taken around 1500 portraits. Other claimants for France's first studio include E. T. Montmirel, and Louis-August Bisson. Montmirel reportedly charged a minimum of ten francs per portrait in 1842, again the equivalent of a week's wages for the average worker.

Also in 1841 Lerebours wrote and published his *Derniers perfectionnements apportés au daguerreotype* and in the following year published his *Treatise on photography*, which sold eighteen hundred copies. A fourth edition appeared in 1843.

Richard Beard opened what is believed to have been Europe's first professional photographic studio at London's Royal Polytechnic Institution, on March 23, 1841, just a few weeks earlier than Lerebours.

Beard, who had initially paid £150 to purchase a licence to use the daguerreotype from Daguerre's English agent Miles Berry, later bought out all Berry's rights and effectively therefore gained control of professional photography in England. His patent control and resulting licensing policy, granting exclusive rights to practice the process professionally within defined geographical areas, arguably constrained the development and growth of professional photography in England for several years.

The Frenchman Antoine François Jean Claudet opened his first studio in London in June 1841, having acquired a licence direct from Daguerre. That set him uniquely outside Beard's patent control. Claudet's Adelaide Gallery prospered for many years, and in the early years especially, was the setting for some of the most significant improvements to the daguerreotype as far as the professional exploitation of photography was concerned. Claudet's chemical improvements considerably reduced exposures, and his other innovations included the painted studio backgrounds which became popular worldwide.

The media was keen to publicise the new medium, and many local newspaper stories were devoted to the opening of professional portrait studios. One of Claudet's former operatives, a 'Mr Edwards,' keen to escape the cost of Beard's English licences when he sought to establish his own professional studio, moved to Glasgow, and opened his own business in the city. *The Glasgow Herald* newspaper in March 1843 noted that

> Mr Edwards, a cadet of the Adelaide Gallery in London—which has turned out some of the very finest specimens of the art—has established his painting rooms (to speak in the old phrase) in a handsome saloon 43 Buchanan

> Street, erected for the purpose, so that the light of day, which acts to him the part of a pencil, may have free and uninterrupted access.

Initially there was insufficient demand for a full-time professional photographic studio, even in some large cities. Photographers had to have another source of income. That might be a bookseller, or even a print-seller.

Itinerant photographers opened temporary studios for a few days or weeks, then moved on to a new location. Their advertisements were remarkably similar on both sides of the Atlantic, separated only by time. In Washington, D.C., the *National Intelligencer* noted on June 30, 1840 that, "Mr Stevenson would inform the citizens of Washington and the District that he has taken rooms at Mrs. Cummings on Penn. Ave. a few doors from the Capitol where he is prepared to take likenesses by the daguerreotype every fair day from 10am till 4pm." Three years later, in the small Scottish town of Dumfries, *The Dumfries & Galloway Courier* announced on March 27, 1843 that Mr Edwards 'of the Adelaide Gallery in London':

> respectfully intimates his arrival in Dumfries, where he purposes remaining a few days, in the exercise of a profession which is altogether new in the South of Scotland. He has engaged apartments at Mrs Williamson's, Irish Street, where his specimens may be seen every lawful day from 10 to 4 o'clock. NB As Mr Edwards has pressing engagements in Russia, Prussia, &c., this may be the only opportunity of his being in Dumfries again, if ever, for a lengthened period of years.

While early professional interest was predominantly directed towards the daguerreotype, it was not exclusively so. Robert Adamson became Edinburgh's first professional photographer to use Talbot's calotype in early 1843. The *Edinburgh Review* noted in January of that year that, "Mr. Robert Adamson, whose skill and experience in photography is very great, is about to practice the art professionally in our northern metropolis." He opened his 'studio' in May of that year at Rock House on the Calton Hill, although the exposure times necessary required the photographs to be taken outdoors in the garden. Despite several daguerreotypists having operated in the city since before the end of 1841, Adamson remained, until 1846, the only professional photographer listed as such in the city's trade and street directories.

Nicholas Henneman, Talbot's assistant, also became a professional calotypist when he was appointed manager of the Reading printing establishment in December 1843, and took some of the images published in *The Pencil of Nature.* By 1848, with the Reading establishment closed, he was operating the 'Sun Picture Rooms,' the calotype studio Talbot had established the previous year in London's Regent Street.

The expansion of professional portrait photography was, understandably, driven by price. While the high price daguerreotype was the sole option, markets remained small and exclusive. The ambrotype widened those markets by providing a lower cost option to those who aspired to a cased portrait, but it was the advent of the carte-de-visite, introduced by André-Adolphe-Eugène Disdéri in 1854 which really established photography as a universal medium. With the carte-de-visite, photography no longer sought to emulate and imitate the painted miniature but, instead, evolved a new and uniquely photographic alternative, which itself created a market for albums, frames and the paraphernalia of portrait collecting.

Interestingly, while no specifically professional manuals were published, the 1850s saw the emergence of handbooks directed specifically towards the non-professional—recognition of the fact that the amateur needed to know less about the manipulation of the medium than his professional counterpart.

Not all so-called 'professionals' had any great understanding of the medium. Henry Mayhew, in his 1861 *London Labour and the London Poor* included as one of his case studies, a 'Photographic Man' who had been a fairground performer before turning to photography, a subject he knew nothing about. Relying on public ignorance of the workings of the photographic process, Mayhew's case study was just one of many con men, who sold poor quality 'sixpenny portraits' to their unsuspecting customers, often moving on to new locations before their disappointed customers could demand their money back. Relying on the fact that the poor seldom possessed good quality mirrors—and thus really did not know what they looked like—Mayhew's 'photographic man' even managed to sell customers portraits of someone else.

Such practices were in sharp contrast to the standards maintained by the great portrait studios of Southworth & Hawes**,** Whipple, Brady and others in the United States or Mayall, Claudet or Kilburn in the UK, and the great commercial photographers like Nadar or Hippolyte Collard in France, Roger Fenton**,** P. H. Delamotte, and others in Britain, or John Carbutt, Alexander Gardner *et al* in America. Indeed, the rapidly falling prices, brought about by the carte-de-visite, are often cited as a likely reason for Fenton's sudden abandonment of photography in 1862.

By the 1870s, the majority of the professional specialisms with which we are familiar today were in place. Portrait studios in their thousands produced cartes and cabinet photographs, while the expanding tourist market was met by output from professional photographer/publishers such as G. W. Wilson, Francis Frith, and James Valentine in the UK, Antonio Beato, the Zangakis, Bonfils and the Sebahs in Egypt, Adolphe Braun and others

in Europe, Bourne and Shepherd in India, the Bierstadts, Notman in Canada**,** and Carleton Watkins, William H Jackson and others in the United States.

Specialist industrial and architectural photographers emerged to photograph the many great construction projects of the Victorian era, aided by more sophisticated equipment, faster emulsions and greater consistency and reliability.

Photographic associations had, from the 1850s, been open to all who were interested in the medium, their meetings populated by amateurs and professionals alike. As the century progressed, however, the requirements of amateur and professional began to diverge. While the amateur was still concerned with experiment, with exhibition and with the interchange of ideas, the professional faced a widening range of challenges, not least of which were to do with copyright and the duplication and dissemination of images. The introduction of cheap methods of photomechanical reproduction of photographs made the resolution of these issues even more pressing.

Until the mid 1870s, the use of photographs as book illustration was easy to control, but with the advent of the Woodburytype, Autotype, and other pigment printing processes, it became easier and cheaper. Walter Bentley Woodbury's *Treasure Spots of the World* published in 1875—and often described as the world's first 'coffee-table book'—heralded the dawn of a potentially large new market for professional photographers.

Copyright laws throughout the first three decades of photography did not include the image, giving the photographer little protection against the commercial exploitation of his/her work by others.

In most countries of the world, by the end of the century, the concept of automatic copyright in a photograph was still decades in the future. In the UK, as copyright in an individual image had to be registered at Stationers' hall, and a small fee paid per image, few photographers exercised a right which they had enjoyed since the 1870s.

Once newspapers and magazines could reproduce photographs, the professional became open to frequent exploitation. Individually the photographer was powerless. Collectively, the profession could bring about change. Thus the century ended, and the 20th century began, with the formation of first professional associations in Britain and the United States.

JOHN HANNAVY

See also: Wolcott, Alexander Simon and John Johnson; Lemercier, Lerebours & Bareswill; Beard, Richard; Talbot, William Henry Fox; Henneman, Nicolaas; Disdéri, André-Adolphe-Eugène; Southworth, Albert Sands, and Josiah Johnson Hawes; Whipple, John Adams; Brady, Mathew B.; Mayall, John Jabez Edwin; Nadar (Gaspard-Félix Tournachon); Fenton, Roger; Delamotte, Philip Henry; Gardner, Alexander; Wilson, George Washington; Frith, Francis; Valentine, James and Sons; Beato, Antonio; Bonfils, Fèlix, Marie-Lydie Cabanis, and Adrien; Braun, Adolphe; Notman, William & Sons; Canada; Societies, groups, institutions, and exhibitions in Canada; Watkins, Alfred; Jackson, William Henry; and Woodbury, Walter Bentley.

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PHOTOGRAPHY IN ART CONSERVATION

Over the centuries the restoration of works of art has been both a business, and a source of additional earnings for artists: Paintings, sculptures and buildings were often part of ritual, or other functional contexts, and often the preservation of such use value was considered to be of more importance than either the artistic value or the historical authenticity of a work of art. Thus, if artists could not preserve the piece by completing or repairing it, they were qualified to replace or remake the lost piece.

Along with the general status of works of art in society, the position of restoration changed during the 19th century: The authenticity of the pieces themselves started to rank higher, although it remained disputed how restoration as a profession should present itself: Theoreticians such as Violett Le Duc took the position that in cases of doubt, the reconstruction of historical monuments and works of art was necessary, while John Ruskin advanced the view that restoration was the most brutal form of destruction. This juxtaposition remained fundamental for debates on conservation well into the 20th century, for example in the disputes surrounding the preservation of monuments in which Georg Dehio and Alois Riegl took part. These controversies affected the work of the restorers.

Until well into the 19th century it had been the task of the artists' appointed gallery directors to restore the paintings within collections. Since the 1850s, restoration increasingly became a profession in its own right, one

Gérard, Léon. Leonardo da Vinci, Drawing Christ in "The Last Supper."
The Metropolitan Museum of Art, Gilman Collection, Purchase, Mr. and Mrs. Andrew W. Saul Gift, 2005 (2005.100.51) Image © The Metropolitan Museum of Art.

which often collaborated with the developing academic discipline of history of art, appropriating and developing a scientific foundation for its practise.

Among the first to work in this field was Humphry Davy who around the same time conducted studies on substances sensible to light and inquired into pigments and papyri excavated in Pompeji, publishing his findings on the latter in 1819. The first laboratory for the scientific investigation and treatment of museum collections was founded in 1888 in the Royal Museum in Berlin, run by Friedrich Rathgen until 1927. Photography, now as then, is being used in restoration mainly for two purposes: on the hand it is used for documenting the inventory, and on the other it is applied to the study of works of art by scientific means and methods.

Arago was already aware of the importance photography could have for the examination of works of art when, in his speech in the Chamber of Deputies on July 6 1839, he drew the attention of the audience to the fact "that if photography had been known in 1798, we should now have correct images of a somewhat considerable number of emblematical pictures, of which the cupidity of the Arabs, or the fatal mania of certain travellers for destruction has for ever deprived the scientific world."

Even though for the moment, scientific documentation receded into the background, initial evidence of it can be found in the volume Egypte, Nubie, Palestine et Syrie published by Louis Desire Blanquart-Evrard in 1852: The work was primarily a commercial enterprise, but the photographs by Maxime Du Camp, illustrating the subject as prints on paper was pathbreaking for the further development of the architectural photography. Du Camp, for instance, had fellow travellers pose in front of the buildings in order to visualize the architectural dimensions. A year earlier, the French Commission des Monuments Historiques appointed photographers such as Edouard Baldus, Hippolyte Bayard und Henri Le Seq to document architectural ensembles in French cities before they were pulled down in the course of modernization. As a consequence of the 'Mission Heliographique,' photographers during the next years were more and more involved in similar enterprises: in 1855, the architect Jean Baptiste Lassous appoints Charles Nègre to document the restoration of the cathedral in Chartres, and Désiré Charnay is sent to Mexico in 1857 to photograph the ruins of the ancient indian cultures. At about the same time, similar initiatives were begun in several German cities: In Cologne, the building authorities ordered pictures to be taken of buildings due for demolition, and in Hamburg, Georg Koppmann was paid to document buildings of historical significance. In other places, such initiatives were triggered by private commercial or antiquarian interest: While Eugene Atget's photographs of the vanishing Paris, for a long time remained in obscurity, Fratelli Alinari in Florence produced and sold photographs with urban motifs. However, of more commercial interest and as well significant for restoration, were the reproductions of sculptures, paintings and graphic arts marketed by Alinari. Similar enterprises were undertaken by Adolphe Braun (Paris/Dornach), Josef Albert and Franz Hanfstaengl (Munich).

These firms systematically reproduced private and museum collections; the catalogue of the company of Adolphe Braun in 1887 offered tens of thousands of different works of art. With these commercial campaigns, a vast number of works were reproduced for the first time and thus were available for the stylistic comparisons necessary for tests of authenticity, the separation of 'hands' and for the purpose of establishing dates. Occasionally however, the commercial photographers caused work for the restorers than aiding them: Well into the 20th century, reproductive photographers exchanged recipies about how to treat paintings in order to obtain stronger contrasts and brighter colours. In particular, cooking oil and mixtures of albumen, sugar and glycerine enjoyed great popularity. To avoid such incidents and, moreover, to participate in the profitable business of reproducing works of art, some museums appointed

their own photographers: Already in 1855, the Louvre had pictures of its collection of antique sculptures taken by an internal photographer, and the prints were used not only for reference in the deeds, but sold to scientists and the interested public. In London the newly founded South Kensington Museum assumed the function of reproducing exhibits for the British Museum and the National Gallery since 1859; the Reproduction Room committed to selling the prints, but closed four years later because the museum's atelier was not able to cope with the demand.

At around the same time, photography was first used to document the work of restoration of artworks: The Munich chemist Max von Pettenkofer had developed a process for regenerating torn varnish, instead of the common practice of removing it from the paintings. To demonstrate the advantages of his process, he had a painting by Domenico Quaglio photographed by Josef Albers, first in 1859 and then again in 1864. The photographs showed a significant increase of fissures and dull spots in the varnish vanishing after the regeneration. Pettenkofer recommended exhibiting such photographs together with the paintings, a suggestion that had rarely been taken into consideration until recently. This kind of photography borders on its application as an analytic tool for restoration.

In the 1890s, Arthus Pillans Laurie used a stereo microscope to investigate the surface of paintings in order to find out which pigments were used by the old masters and to detect forgeries by analyzing the brush strokes; however he published most of the results only after the turn of the century. As well, Theodor von Frimmel used microscopes and photographs to understand the regularities of the formation of crackles in the paint; he published one of his photographsin his Handbuch der Gemäldekunde (1894). Raking light was systematically used for the investigation of paintings since the 1890s: with its help, traces of pentimenti and earlier versions could be detected. In the course of restoration of two portraits by Christoph Amberger in Braunschweig in 1892/93, subsequent alterations were discovered, changing the donors into saints; the findings were confirmed by later radioscopies. X-ray examinations of works of art were executed within months after Röntgen published his discovery in January 1896, indicating that lead paint absorbs the radiation.

Already in March 1896 the Frankfurt physicist Walter König had investigated paintings using X-rays. In the following years, a number of smaller publications referred to the new method of examination, which proved to be particularly useful for the verification of works of art. Around 1913, the Weimar roentgenologist Alexander Faber systematically researched the absorptions of different pigments used for paintings, and even though the general procedure was known at that time, in 1914 he was issued a patent for a 'Procedure for the determination of overpaintings in oil paintings and similar objects.'

Other photographic methods for the investigation of works of art in use today were not applicable yet in the 19th century. Since Hermann Wilhelm Vogel had developed the appropriate emulsions in 1873, infra-red photography was technically possible; for paintings, however, it has only been in use since the 1930s. On the other hand, while the sensitivity of photographic emulsions to ultra-violet rays has been known since the beginnings of photography; it became of practical value only after the invention of the mercury vapour lamp by Küch in 1906. Its first application for purposes of restoration was by P.R. Kögel who, with the help of this method, could decipher illegible palimpsests.

A curiosity in this context is the heliography of a painting by Vernet now preserved in the Harrach collection in Rohrau/Lower Austria: The canvas of the painting was penetrated by a bomb splinter during the revolutionary fights in Vienna in 1848. The hole, however, was not mended: instead, a small piece of cardbord with a note about the damage was mounted to the back of the painting, such that it was readable through the hole. In this state the painting was reproduced. The hole was mended only in the course of another restoration executed in 1961.

FRIEDRICH TIETJEN

See also: Davy, Sir Humphry; Blanquart-Evrard, Louis-Désiré; Du Camp, Maxime; Baldus, Édouard; Bayard, Hippolyte; Mission Héliographique; Nègre, Charles; Alinari, Fratelli; Braun, Adolphe; South Kensington Museums; X-Ray Photography; and Vogel, Hermann Wilhelm.

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PHOTOGRAPHY OF PAINTINGS

The graphic reproduction of works of art has an extended and diverse history and photography followed the tradition in which the depiction of the fine and decorative arts bestows some kudos on the reprographic processes being used. Photography was invented at a time when a large and vibrant market in the reproduction of paintings was rapidly evolving. This market encompassed a wide range of sectors from highly expensive *de luxe*

Unknown (Photographer). Galerie Anglaise. *The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.*

engravings to cheap wood cuts used a loose prints or to illustrate cheap such as the *Penny Magazine*, first published in 1831, that produced 'a revolution in popular Art throughout the World.

Both Louis Jacques Mandé Daguerre (1787–1851) and William Henry Fox Talbot (1800–1877) appreciated the importance of reproducing works of art (including paintings, drawings, engravings, sculpture and decorative art) not only for proof of their respective photographic processes but also for their commercial application. Subsequently, during the 19th century art reproduction was to form a key and commercially very significant part of the photographic market. Until the 1870s, the photography of works of art (including paintings) was considered a standard advertised service offered by commercial photographers.

At the time of photography's invention a plethora of reprographic processes were available and by 1859 William John Stannard listed no less than 156 in his privately published *Art Exemplar*. These relief planographic processes were being exploited to meet the rising demand for loose graphic reproductions and the business opportunities offered by rapidly expanding and diversifying commercial markets. Throughout the 19th century, photography was to compete and interact with manual reprographic processes in the reproduction of paintings. Indeed this forms a significant part of the history of photography during the 19th centuy.

During the 1840s a variety of amateurs used the Daguerreotype to document paintings in their collections though the scale and scope may never be known. In parallel, commercial photography was being used to document public collections—or collections open to the public. In February 1848, Richard Beard, a leading London photographer, had been given permission to Daguerreotype paintings in the National Gallery in London and a month later a certain John Woolley asked 'permission to make copies of two or three pictures in this gallery by means of the Calotype Camera.' Such small but significant activities were being undertaken in many countries.

It is also known that during the 1840s leading artists had their paintings photographed. Jean-Auguste-Dominque Ingres (1780–67) was one of the earliest acclaimed contemporary painters to apply photography to document his work. In 1842 he had a Daguerreotype taken of his painting of Saint Peter destined for Santa Trinita dei Monti in Rome. This may have been to enable Ingres to have Daguerreotypes with which to teach his students. In 1848 Gustave Le Gray (1820–1884) Daguerreotyped the painting *Anacréon, Bacchus et l'Amour* by Jean-Léon Gérôme (1824–1904) exhibited at that year's Salon. In the 1860s Gérôme developed extremely close professional relationships with the photographer Robert Bingham (1825–70), regularly having his paintings photographed before being sold. Gustave Courbet (1819–1877) exploited photography to reproduce his paintings and had commercially available photographs produced of those paintings that were refused by the 1855 Salon. Photographers including E. Baldus, P.A. Richebourg, E. Carjat and C. Michelez all registered photographs of paintings by Courbet at the Dépôt legal in Paris.

The photography of painting was identified as significant by a wide range of influential photographers during the 1840s and was strategically used to further the cause of the revolutionary process. An album of Calotypes by David Octavius Hill (1802–70) and Robert Adamson (1821–48), presented to the Royal Academy of Arts in London in *c.*1848 included a reproduction of a painting entitled *The Dance* by William Etty (1787–1849).

However, the photography of paintings, like most applications of photography, was to scale up very significantly from the early 1850s. While most 19th century commercial photographers marketed themselves as generalists covering the general requirements of their customers across Europe and beyond, some created significant reputations for art reproduction. These included Fratelli Alinari of Florence, Adolph Braun (1812–1877) of Dornach, Robert Macpherson (1814–1872) and James Anderson (1813–1877) in Rome, Leonida Caldesi (1823–1891) an Italian working in London, Robert Bingham (1825–1870) the Parisian-domiciled Englishman, and Juan Laurent (1816–c.1890) and Charles Clifford (1819–1863) in Madrid; Hanfstaengl and F. Bruckmann in Munich; At the end of the century Frederick Hollyer (1837–1933) was renowned for his reproduction of paintings, particularly using the Platinum print process.

By the 1850s all aspects of the commercial art world including painters, sculptors, architects, engravers, art dealers and auction houses had adopted photography. The public sector in the form of museums also adopted the medium and in some instances appointed photographers. Charles Thurston Thompson (1816–1868) was one of the earliest of these and his career at the South Kensington Museum (now the Victoria & Albert Museum) during the 1850s and 1860s set an benchmark as he recorded the permanent collections, temporary loan exhibitions and ventured abroad to photograph in France, Spain and Portugal. It is significant that as early as the 1860s commercial photographers were complaining that museum 'in-house' photographers –such as Thurston Thompson—were given preferential treatment and were being heavily subsidised by Government departments that enabled them to undercut the prices at which they sold photographs. In Thompson's case this was largely due to the sappers from the Royal Engineers that were being used at South Kensington as part of the unofficial yet permanent photographic facilities.

By 1880 the South Kensington Museum held a collection of some 50,000 photographs acquired from a variety of sources and channels all over the world. Many of these were reproductions of paintings. Thompson also undertook commercial work photographing paintings on behalf of leading art dealers. In 1863 he was employed by the art dealer Ernest Gambart (1814–1902) on several occasions to photograph paintings that he was selling. These included *Shetland Ponies* and the *Ferry Boat crossing the Lake in the Highlands* by Rosa Bonheur (1822–1899), and *Derby Day by* William Powell Frith (1819–1909).

The photography of paintings was hindered by a number of technical problems during much of the 19th century. Levels of illumination were particularly critical. In the early 1840s Talbot had taken paintings outdoors into the cloister at Lacock in order to enable high enough levels of illumination for adequate camera exposures to take place and this practice continued for several decades. In 1858 the Raphael Cartoons were taken outdoors from Hampton Court Palace to be photographed twice in parallel, once by Charles Thurston Thompson and once by Leonida Caldesi. To the modern observer the general views photographed of this work being undertaken by Thompson and Caldesi are curious since the paintings have been placed upside down. This was to enable easier framing on the ground glass screen of the camera—the image on a plate camera always being vertically inverted from the actual view as seen by the human eye.

Many paintings are hung in ways that make their photography difficult or impossible. Paintings can be hung high off the ground. They can be hung in corners and thus have restricted illumination. In 1860 paintings from the Royal Collection at Buckingham Palace were removed to the London photographic studio of Caldesi, Blanford, & Co for photography to take place. From the 1850s some public museums and galleries built photographic studios to enable photography of paintings to take place.

To counter the challenges of instances where paintings could not be moved—such as wall frescoes—some photographers built scaffolds to position the camera at the paintings mid-point and thus remove any distortion. The most significant example of this was the use by Adolphe Braun et Cie. Of a movable scaffold to photograph Michelangelo's frescoes in the Sistine Chapel in Rome. These photographs, published in 1869 using Swann's Carbon print process and almost exclusively of details the fresco scenes, had a major impact on the study of these paintings and were greeted with universal acclaim.

While the use of mirrors to reflect light was known, artificial light sources were very rarely exploited in the photography of painting during most of the 19th century. Artificial light sources were very rarely used in the photography of painting during most of the 19th century the preference was for natural 'North' lighting in studios. One particularly significant early example of the use of artificial lighting to photograph paintings took place in the subterranean Early Christian Catacombs in Rome during the late 1860s and 1870s where magnesium light was used to illuminate the Early Christian fresco decora-

tion. These images appeared in the publications of John Henry Parker (1806–1884) dealing with the Roman and Early Christian archaeology of Rome.

One of the most prominent challenges to the photography of painting was the limited spectral sensitivity of black and white photographic materials that could not reproduce the full colour spectrum. This was of particularly apparent in the reproduction of paintings and frequently evidenced in religious paintings where the traditional blue colour of the Virgin Mary's cloak would be reproduced as a very light tone due to the photographic emulsions being oversensitive to blue thus making a very dark area on the negative—which in turn printed as a light tone in the photographic print. Some photographers 'retouched' their negatives of paintings to counteract the tonal imbalances introduced by the spectral sensitivity of the photographic emulsions they used. Others retouched the photographic print and then rephotographed the retouched photograph in order to create a second negative from which they might print more tonally accurate photographic prints. That photographers were willing to go to such lengths indicates the commercial value of the market for photographs of paintings during the 19th century and it is significant that it was the specialist photographic art reproduction company of Adolph Braun that developed and then introduced improved orthochromatic (or isochromatic) emulsions in 1878, fully panchromatic film being introduced in 1905.

Related to this technical limitation of 19th century photographic processes is the fact that during much of the 19th century photography was exploited to copy reproductions after paintings, such as engravings, lithographs and the like. Undoubtedly, the copying of achromatic engravings was a simple and thus extremely cheap form of copy photography. In some instances there were practical and economic reasons for photographers or publishers not being able to photograph directly from paintings. However, throughout the 19th century the engraving remained highly esteemed and thus photographs of important engravings after paintings were frequently seen as valuable in their own right.

Producing 'colour' photographs of paintings was addressed in a number ways. Firstly, was the hand colouring of monochrome photographs of paintings. An example of a hand coloured Calotype from the studio of Nicolaas Henneman dated to the late 1840s survives and the colouring of Daguerreotypes was also well developed by this time as photographers exploited the professional talents of miniature painters in new commercial fields. A significant market for coloured photographs developed and Vincent van Gogh (1853–1890), while working in the London office of the printseller Goupil, mentioned this in a letter to his brother in November 1873.

The development of hybrid reprographic processes was also an avenue that was explored to reproduce paintings in colour. Between 1864 and 1866 Jules Labarte's *Histoire des Arts Industriels au Moyen Age et à l'époque de la Renaissance* was published and was illustrated with two 'albums' containing 150 plates created by the Parisian printer Lemercier through a synthesis of photographic, lithographic, photomechanical and chromolithographic processes. However, few of the plates are of 'paintings.' Similarly, the Photochromie process of Léon Vidal (1834–1906) introduced in 1875 and which combined chromolithography and the Woodburytype photomechanical process was little used to reproduce paintings.

Colour photographic processes were developed as early as the late 1860s and paintings by Edouard Manet (1832–1883) reproduced at this time. Charles Cros (1842–1882), the inventor of one of the earliest colour photographic processes copied *Jeanne—Le Printemps*, Manet's portrait of Jeanne Demarsy, dated 1881–82. This photograph was used by Ernest Hoschedé (died 1892) for the cover of his review *Impressions de mon voyage au Salon de 1882* (A. Tolmer, Paris, 1882). Cros and Manet shared an interest in the problems of colour-printing technology and the reproduction of this painting was part of their experiments in colour photogravure.

Photographs of paintings were disseminated through a number of channels. Print dealers dealers formed a primary channel. In Florence, Fratelli Alinari formed an association with the print seller Bardi in the early 1850s. In the same decade the London firms of Paul and Dominic Colnaghi and Thomas Agnew & Sons commissioned and published photographs of paintings. Together these two dealers copublished one of the landmarks in the photographic reproduction of paintings *Photographs of the "Gems of the Art Treasures Exhibition," Manchester, 1857*. This title consisted of some 200 photographs—100 "Ancient" masters and 100 'Modern' masters—taken directly from the paintings. These photographs formed a milestone in 19th century art historiography in that it helped in the reattribution of a number of works by the Old Masters, often to the detriment of the owners who had perhaps sent a work of an 'Old Master' to Manchester only to have it returned as a copy or work of another, lesser artist. A contemporary review of these photographs also pointed to the democratisation of art; "These things bring Art nearer the reach of the poor man—to whom it will some day become, not mere furniture and wearying luxury, but hope and comfort, and prophecy and exhortation."

Colnaghi set up a photographic studio specialising in art reproduction and formed a professional relationship with Leonida Caldesi that prospered during the late 1850s and 1860s.

Throughout the 19th century stationers and book shops also provided a wide range of photographs for

purchase. Little research has been undertaken in the role of such outlets. However, they played a significant role in the distribution of photographs of works of art at a regional and particularly a local level. In parallel, purchasing photographs of paintings from printed catalogues remained common throughout the 19th century.

Some remarkable works were created using photographs of paintings. At the 1862 International Exhibition held in London, the Belgian photographer Edmond Fierlants (1819–1869), was reported to have exhibited two works, copies of orginals by Hans Memlinc (ca.1440–1494); a life-size replica of the *Shrine of St. Ursula*, with photographic reproductions of the painted panels (at £45), and the *Mystic Marriage of S. Catherine* (at £12. 4s).

A wide variety of photographic print formats were exploited for art reproduction during the 19th century. These ranged from thumbnail-sized prints, used as border decoration in photo albums, to the large Elephant format images of paintings in major European galleries published in portfolios by Adolphe Braun et Cie. In some instances a variety of different loose print sizes were available of the same image. The carte de visite from the 1850s and Cabinet from the 1860s were both used to document a wide variety of works of art including paintings. Paradoxically, examples of photographic stereoscopic views of paintings are also known, though given the two-dimensional nature of most paintings this format seems particularly inappropriate.

The photographic lantern slide, one of the cornerstones of the teaching of art history, was invented in the late 1840s and was beginning to have a significant impact in the teaching of art in Germany by the end of the 1870s. It was not until the 1960s that this format was abandoned in favour of the 35mm slide. It is also significant that black-and-white photographic slides remained predominant—particularly in German-speaking countries, since there were widely held beliefs that the "inaccuracy" of colour photography could distort the reproduction of the original painting.

The use of photography for the illustration of art books began in the 1840s and has proved to be one of the most significant applications of photographs of works of art. Talbot's Reading establishment printed the photographic illustrations to William Stirling's *Annals of the Artists of Spain* published in 1848. Although as few as 50 copies—25 each in quarto and octavo format—may have been produced, the publication was doubly important; firstly as the first photographically illustrated art history book and secondly that some of the illustrations were photographs taken directly from the paintings they represented, rather than manual intermediaries such as engravings or lithographs. British publishers such as Samson Low, Bell & Daldy, A.W. Bennett, Day & Son, Seeley, Jackson & Halliday and Bickers & Son were prominent as publishers of photographically illustrated art books during the 19th century and several thousand titles were published during this period. While many of these photographically illustrated books contained pasted in Albumen prints of paintings (or reproductions after them), by the end of the century photomechanical processes were almost exclusively used.

Though comparatively little appreciated in the 21st century, the 19th century photography of paintings formed a central position in the history of the medium during that century. This was from an aesthetic, technical and market development perspective. The impact on the history and study of painting is difficult to over estimate.

ANTHONY J. HAMBER

See also: South Kensington Museums; Photography and Reproduction; and Daguerreotype.

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PHOTOGRAPHY OF SCULPTURE

The practice of drawing from sculpture—particularly from ancient sculpture—was a central element in the education of artists in Italy during the fifteenth and sixteenth centuries. Antiquities such as the *Apollo Belvedere*, the *Belvedere Torso,* and the *Laocoön*—after its rediscovery in January 1506—were fundamental to the figurative vocabulary of every Renaissance artist. Indeed, the study of sculpture complemented direct study of the human figure, and, in the case of the female figure, an antique *Venus* might serve as a surrogate for a live model. Life drawing and the study of plaster casts of sculpture remained at the core of every academic art curriculum in Europe and in North America throughout the early modern period.

Photography was presented as a new form of drawing, and so it is not surprising that sculpture became one of the primary categories of subject matter among the English and French pioneers of the new art. Nor is it surprising that plaster replicas of many of the works that had been important to the formation of Renaissance artists should also have had a formative influence on the early history of photography. In the 1840s the *Apollo Belvedere* and the *Medici Venus* were still considered to represent the Greek ideal of male and female beauty. Small-scale portable versions of these and other ancient

Lampue. Still Life of Sculpture and Architectural Fragments.
The J. Paul Getty Museum, Los Angeles
© The J. Paul Getty Museum.

sculptures were popular souvenirs among visitors to Italy and were therefore natural and readily available models for early photographers. Life-size casts of the same works became essential elements in academic training in the fine arts. Photography was assimilated into this practice through the production of 'academies' for study by posing nude models.

In the first sentences of his commentary on the *Bust of Patroclus* in the first fascicle of *The Pencil of Nature*, William Henry Fox Talbot defined what was to become an important and continuing relationship between photography and sculpture:

> Statues, busts, and other specimens of sculpture, are generally well represented by the Photographic Art; and also very rapidly, in consequence of their whiteness. These delineations are susceptible of an almost unlimited variety: since in the first place, a statue may be placed in any position with regard to the sun, either directly opposite to it, or at any angle: the directness or obliquity of the illumination causing of course an immense difference in the effect. And when a choice has been made of the direction in which the sun's rays shall fall, the statue may then be turned round on its pedestal, which produces a second set of variations no less considerable than the first. And when to this is added the change of size which is

> produced in the image of bringing the Camera Obscura nearer to the statue or removing it further off, it becomes evident how very great a number of different effects may be obtained from a single specimen of sculpture.

In fact, sculpture featured prominently in Talbot's own repertoire almost from the inception of photography. In a memorandum of March 1840 he placed sculpture first among ten divisions by which he classified photogenic drawings, and notes of photographs he took in 1840 establish that many of those depicted sculpture. The *Patroclus* appears several times, and an *Apollo*, a *Venus*, an *Eve*, and four *Sabines* are also listed. In fact, more than a dozen negatives depicting a miniature version of Giovanni da Bologna's *Rape of the Sabine Woman* are known. Although Talbot photographed the *Patroclus* in the south gallery of Lacock Abbey, it was often the case that the sculptural subjects would be carried outside to be photographed in the grounds of the abbey, and in some instances it is apparent that the object is standing on grass. It is noteworthy, therefore, that *Diogenes*, a sculpture in the entrance hall of the Abbey, was one of the first subjects Talbot photographed after discovering the latent image. It is also significant that a small-scale replica of Antonio Canova's *The Three Graces* is the subject of a photograph that is being made in the well known panorama of Talbot's Printing Works at Reading.

Photographs of sculpture likewise appear in all Talbot's photographically illustrated books. The first of these, the *Record of the Death Bed of C. M. W.*, has as its frontispiece a plate depicting a marble bust of the deceased. The *Patroclus* is illustrated twice in *The Pencil of Nature*, first as plate V and again as plate XVII. Plate six in *Sun Pictures in Scotland* is a photograph of a sculpted effigy of Maida, Sir Walter Scott's favourite dog. The volume of *Talbotype Illustrations* that was published to accompany copies of Sir William Stirling's *Annals of the Artists of Spain* contains several photographs depicting works of sculpture.

Sculpture was also among the first subjects treated in the earliest history of photography in France. In 1838 and 1839 Louis-Jacques-Mandé Daguerre photographed still-life compositions that included statuettes and reliefs. One well-known daguerreotype representing a collection of shells and fossils is effectively a miscellany of sculptural objects. Sculpture was the principal category of subject matter in the body of work made by Hippolyte Bayard in 1839 and 1840. Photographs mounted in an album preserved in the Société française de photographie in Paris, for instance, show that he photographed some forty different plaster casts in this formative period. Bayard continued to photograph arrangements of sculpture during the 1840s and 1850s. Among these pictures is one beautiful composition in which five different casts form a figurative garland around a replica of the renowned *Venus de Milo*.

Bayard, Daguerre, and Talbot evidently recognised and exploited the fact that plaster casts, because of their whiteness and stability, provided ideal practical models for photography. However, Talbot's interest in the *Patroclus,* the *Sabines,* and the *Three Graces* may also have been stimulated by a wish to explore the possibility of depicting expression and movement. The *Patroclus* is an exceptionally animated sculpture, one that appears physically and spiritually alive. Giambologna's sculptural group, described in John Murray's *Handbook* of 1847 as "wonderful for its expression and its energy of action," neverthelesss stands patiently still for Talbot, enabling him to capture its violent torsion and turbulent energy. Similar points might be made with respect to Charles Nègre**'s** renowned photograph of 1859 depicting the sculptural group *Boreas and Orythia* in the Tuileries Gardens in Paris.

David Octavius Hill and Robert Adamson occasionally introduced works of sculpture into their portraits and subject pictures. In these portraits the sculpture alludes to the nature of the sitter, much as books do in Hill and Adamson's portraits of churchmen, and in this respect the sculpture serves as do the coins medallions, and statuettes that appear in Renaissance portraits by Bronzino, Titian, and others. A calotype of Elizabeth Rigby, for instance, portrays her with a plaster cast of a bronze by Pierre Philippe Thomire depicting two cupids fighting over a heart. This group is clearly appropriate to a portrait in which the sitter is depicted in a mood of romantic reverie. A colossal head entitled *The Last of the Romans* serves straightforwardly as an 'occupational' attribute in Hill and Adamson's portrait of John Stevens, the sculptor responsible for this work. This head functions more allusively in *The Morning After'He Greatly Daring Dined,'* a composition that is perhaps a lightly moralising sermon on the effects of intemperance. Transporting the sculpture to Rock House must in itself have been a considerable challenge. In a more serious vein, the sculptural tombs in Greyfriars Churchyard provide settings for compositions by Hill and Adamson that are in effect meditations on mortality.

In the spring of 1846 the Reverend Calvert Richard Jones made two negatives in Florence from Giovanni da Bologna's *Rape of the Sabine Woman*. These studies recall Talbot's earlier efforts to record his miniature *Sabines* and serve also a form of homage to Talbot. However, Calvert Jones's pictures of Giambologna's sculpture and a precisely contemporaneous photograph of Baccio Bandinelli's *Hercules and Cacus* are also instances of the employment of photography to document works of art for touristic purposes. Such images enabled the traveller—like Napoleon—to carry off 'trophies' of travel. Indeed, the first catalogue produced by the Fratelli Alinari consists entirely of architectural views and photographs of sculpture. Such photographs

also enabled the armchair traveller to experience these attractions without having to leave home.

The ritual of purchasing photographic 'spolia' became an integral part of the 'work' of tourism, and photographs of sculpture formed a significant portion of any representative collection of views of Florence, Rome, and Venice, for example. Among the innumerable photographers that supplied such portable records were—in addition to the Alinari—James Anderson, Adolphe and Henri Braun, Giacomo Caneva, Robert Macpherson, Carlo Naya, and Carlo Ponti. Photographs of ancient sculptures excavated in Rome during the pontificate of Pius IX contributed to the myth of the Papacy, as did the lavish photographic albums documenting the Vatican sculptures that Macpherson and the Brauns published in the 1860s. Working farther afield in the sphere of travel photography, including the photography of sculpture, were, for instance, Felix Bonfils in Athens and Constantinople; Maxime Du Camp, Francis Frith, John B. Greene, Félix Teynard in Egypt; Lous De Clercq in Syria; Auguste Salzmann in the Holy Land.

Travel photography and photography that was intended to document the history of art and architecture were closely related. In France in the early 1850s, Charles Nègre, Em. Pec, and Henri Le Secq recorded the sculpture at Chartres, for instance, in addition to photographing the cathedral itself. In England, Roger Fenton was employed in 1854 to document the ancient sculpture in the British Museum. After constructing a studio on the roof of the museum, Fenton set about photographing dozens of Assyrian tablets and other works of sculpture. In order to ensure that there was sufficient light, it was often necessary to have the objects carried out on to the roof itself, a practice that in turn required Fenton to devise ingenious ways of controlling and modulating the natural light; occasionally he would even dust the sculpture with powder to make the surfaces more conducive to photography. Between February 1854 and May 1856, Fenton and his assistants produced over eight thousand salt prints of sculpture. From these beginnings, the scholarly study of sculpture became inseparable from the history of the photography of sculpture, and understanding of particular works of sculpture was shaped in significant part by the character of the photographs that were available. Conversely, the interests and needs of art historians might affect the nature—general views and details—and particular viewpoints of the photographs that were made.

Sir David Brewster's invention in 1849 of the stereoscope made it possible to produce photographs of sculpture that more closely approximated the sensation of relief and volume provided by the subject itself. Sir David himself affirmed that such views would enable the student of sculpture to "avail himself of the labours of all his predecessors." He would "virtually carry in his portfolio . . . the gigantic sphinxes of Egypt, the Apollo, and Venuses of Grecian art, and all the statuary and sculpture which adorns the galleries and museums of civilized nations." Indeed, such images came to be perceived as accurate and true substitutes for the models themselves. As a result of the publication of millions of inexpensive stereoscopic prints and slides of ancient and modern statuary, sculpture was literally "photographed into . . . popularity."

Talbot's observations concerning the "almost unlimited variety" that is possible when photographing sculpture raises important questions concerning the nature of the relationship between the two media. In relation to the graphic arts and printing, for instance, photography is a reproductive process in which the correspondence between the matrix and the image appears relatively straightforward. For a start, the subject and the photograph are both two-dimensional. A photogenic drawing of an engraving or a leaf is a direct impression of the object made by the action of light. With sculpture, however, the relationship between the object and the image is exceedingly complex and is, as Talbot indicates, "susceptible of an almost unlimited variety."

Elements contributing to this variety are the three-dimensional character of the matrix, the changing nature of the sculpture's ambience, and the character of the photographer's intervention. Rather than being an impartial and objective impression of the subject, a photograph of a sculpture is a discrete image, one that is a visible record of dialogue between photographer and object, a dialogue that took place at a particular place and time. This dialogue may be affected significantly by the conditions under which the photographer is working and by the limitations of contemporary technology. In order to produce a satisfactory plate of Alessandro Vittoria's *St Jerome*, for instance, the Venetian photographer Carlo Naya left his camera standing in the Frari for several days.

That a photographer may take possession of a sculpture is illustrated by the famous series of photographs of Auguste Rodin's *Balzac* created by Edward Steichen in 1908. The ambivalent relationship between sculpture and photography was also recognised by Constantin Brancusi when he asked Man Ray to teach him how to make his own photographs. Underlying this request was Brancusi's experience of seeing a photograph of his work by Alfred Stieglitz. "It was a beautiful photograph, [Brancusi] said, but it did not represent his work. Only he himself would know how to photograph it." Even when the photographer is self-effacing, as the American art historian and photographer Clarence Kennedy intended to be, the image is inevitably a record of a dialogue between the photographer and the object.

GRAHAM SMITH

See also: Talbot, William Henry Fox; Daguerre, Louis-Jacques-Mandé; Bayard, Hippolyte; Nègre, Charles; Hill, David Octavius, and Robert Adamson; Jones, Calvert Richard; Fratelli Alinari; Anderson, James; Braun, Adolphe; Caneva, Giacomo; MacPherson, Robert; Naya, Carlo; Ponti, Carlo; Travel Photography; Du Camp, Maxime; Frith, Francis; Greene, John Beasly; Teynard, Félix; De Clercq, Louis; Salzmann, Auguste; Nègre, Charles; Le Secq, Henri; Fenton, Roger; Brewster, Sir David; Steichen, Edward J.; and Stieglitz, Alfred.

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PHOTOGRAVURE

An intaglio photomechanical printing process invented by Karl Klic (1841–1926) of Vienna in 1879. It was based on F.H. Talbot's photoglyphic engraving process of 1852. Intaglio refers to methods of printing in which the lines, dots, grain or other elements of the printing plate, are sunk in the plate so that the depressions are filled with ink for printing. Photogravure, aka. gravure, aquatint photogravure, dust grain photogravure or Talbot-Klic process, is the best known intaglio process. In capable hands, it can produce high quality images with a rich matt surface, on a wide variety of papers.

Common etchings, mezzotints and line engravings are also intaglio processes.

Photogravure is the ultimate facsimile process for the reproduction of etchings because the lines it reproduces are actually etched in the printing plate just like the original etching plate. Rembrandt's work has been the subject of more facsimile reproductions than any other artist's. Philip Gilbert Hamerton (1834–1894), in his book*, The Graphic Arts* (1882) provides an insight into the techniques used in France. On Goupil, "... [it] is a secret, and all I know about it is that the marvelously intelligent inventor discovered some means of making a photograph in which all the darks stood in proportionate relief, and from which a cast in electrotype could be taken which would afterwards serve as a plate to print from." On Dujardin "… he covers a plate made of a peculiar kind of bronze with a sensitive ground, and after photographing the subject on that simply etches it and has it retouched with the burin if required." And on Amand Durand, "He bites his plates like ordinary etchings; and when they are intended to represent etchings he rebites them in the usual way and works upon them with dry point, &c., just as an etcher does, but when they represent engravings he finishes them with the burin." He concludes, "The reader now perceives the essential difference between the Goupil process, in which there is no etching, and the processes employed by the héliograveurs, which are entirely founded upon etching."

Photogravure was popular with pictorial photographers at the end of the 19th century and in the early part of the 20th century. The most impressive use of this process was the production of Edward S. Curtis' 20 volume work, *The North American Indian*, each containing 75 hand-pulled photogravures and 300 pages of text, produced between 1907 and 1930. Alfred Stieglitz's Camera Work, which had 53 issues between 1903 and 1917, included 544 illustrations, 416 of which were photogravures. Alvin Langdon Coburn (1882–1966) produced the photogravure illustrations for his books —83 plates and over 40,000 prints.

Peter Henry Emerson (1856–1936) used platinum printing for his first book but learned photogravure, which he referred to as "photo-etching," a term a found more suitable to a medium of original expression rather than as a method of reproduction. His best known works include *The Compleat Angler, or the Contemplative Man's Recreation,* a two-volume work (1888, 54 photogravures) and *Wilde Life on a Tidal Water. The Adventure of a Houseboat and Her Crew* (1890, 30 photo-etchings).

Around the 1880s, Thomas Annan (1829–1887) entered into a partnership with Sir Joseph Wilson Swan and purchased the rights to use the photogravure process from the Imperial Printing Works in Vienna. His most impres-

Annan, James Craig. A Wayside Shrine, Ronda.
The Metropolitan Museum of Art, Alfred Stieglitz Collection, 1949 (49.55.271) Image © The Metropolitan Museum of Art.

sive work was published in photogravure by his second son, James Craig Annan (1864–1946), *Old Closes and Street—Glasgow, A Series of Photogravure, 1868–1899* (Glasgow, T&R Annan & Sons, 1900, 50 plates).

More recent efforts include portfolios of the photographs of Robert Mapplethorpe (1946–1989) and Eduard Steichen (1879–1973).

Aquatint photogravure is practiced today by a small group of artist photographers and printmakers. The early process did not meet the requirements of popular publications which required large print runs rapidly executed. The improvements have been too numerous to be discussed at length in the context of this article but we will mention the main inventions. It was the same Karl Klic mentioned above, who founded the Rembrandt Intaglio Printing Co., at Lancaster, England, in 1895, where the first rotary gravure (aka. rotogravure) process that made use of a doctor blade (to wipe the excess ink off the surface of the plate) and a cross-line screen was secretly exploited for many years. Printing from cylinders on paper fed from large spools reduced the cost of high-quality photogravures to a point where they began appearing in popular publication.

Although the square pattern of photogravure screens is normally associated with mass produced rotogravures, Austrian born Theodor Reich worked out a way to use a cross-line screen with a flat-plate gravure ca. 1897 and sold his invention to F. Bruckmann of Munich in 1903. The process was exploited under the name mezzo-tinto-gravure and was advertised in the Penrose Annual until at least 1927.

In 1904 the first rotogravure plant in America, the American Photogravure Co., started operation in Philadelphia. In 1910 the first example of the Rembrandt Intaglio color process appeared in a book, Colour Printing and Colour Printers, by R.M. Burch and C.W. Gamble. In the same year, Mertens introduced his Monochrome Intaglio Process, i.e., intaglio pictures combined with letterpress text. This method was popular until the 1950s. In 1913, Alfred Stieglitz' Camera Work published five duogravures in the April/July issue. These two- color gravures should not be confused with the duotone photoengravings advertised as "duogravures" which appeared in many books published by the Boston firm L.C. Page & Company during the years 1901 and 1925. In was not uncommon in those days for publishers to claim that the cheaper processes they used, including collotype, were photogravure.

Until fairly recently, the modern commercial process was called screen photogravure or rotogravure. In this process, the continuous tone positive and gravure screen were exposed in succession onto carbon tissue which was then mounted on the copper-plated gravure cylinder. A later form, where the plate is made flat and afterwards curved around a cylinder, was known as "plategravure" (ca. 1930s).

In an effort to remove one of the main difficulties of the original photogravure process, researchers have tried to replace the chemical etching step with other methods that involved "spark erosion" and laser engraving, the latter developed by Crosfield but abandoned in early 1990. The most popular method currently employed is based on the electromechanical engraving process invented by Hell in Germany in 1952. The Helioklischograph uses up to a dozen vibrating styli with diamond tips that peck out tiny pits in the copper surface.

LUIS NADEAU

See also: Baldus, Edouard; Curtis, Edward Sheriff; Goupil & Cie; and Niépce, Joseph Nicéphore.

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PHOTOHISTORIANS

For several decades after the publication of the first photographic processes in 1839, and indeed for most of the nineteenth century, photography was primarily regarded as an invention. Its history, therefore, was predominantly written as the history of an invention, comparable as such to histories of the steam engine or the electric telegraph, and more often than not filled with the petty personal quarrels, as well as broad generalizations on the invention's utility, that attended such enterprises at the time. Accordingly, most of the first historians of photography were its scientific patrons, inventors, or early practitioners, and the histories they wrote were predominantly "technical," as they have often been called, or rather professional and promotional. After 1914, and more so after 1930, new brands of photohistorians emerged, some of them early collectors of photography's incunabula, but others from outside the ranks of the profession and even the realm of amateurs. Between 1930 and 1970 they gradually changed the perception of nineteenth-century photography, which came to be regarded more as a socio-cultural artefact, and also appreciated in artistic as well as financial terms. Starting in the 1960s and especially after 1970, the influence of art historians, museums, the art market, and art-historical models on photographic history became more marked, without extinguishing other approaches, especially those of collectors, by then more specialized, and cultural historians and critics, who challenged traditional art-historical assumptions while broadening even more the scope of photographic history.

The very first attempts at writing a history of photography were embedded in the very procedures of publication of the various processes that competed for recognition and influence, starting in 1839: thus François Arago's and, to a lesser extent, William H.F. Talbot's presentations to the French and British learned bodies contained some historical research on the origins of the invention. These accounts aimed, among other goals, at establishing the usefulness and even the cultural legitimacy of the invention. They were decidedly less technical than broadly scientific, and placed photography—envisioned as a discovery, even more than an invention—within a relatively long-term history of science. Thus Arago, while endorsing the claims of the French inventors Niépce and Daguerre, was the first to link their research to those of alchemists, as well as earlier (French) physicists, be it in order to better stress the magnitude of the inventors' achievement. Incidentally, it must be noted that Arago's choice to designate Daguerre and the daguerreotype—over Talbot, but also over Niepce—as the true beginners of photography caused, in France, a long string of priority claims and vindications (Isidore Niépce's in 1841, Victor Fouque's in 1867, Adolphe Mentienne's in 1891, etc.) that led to sometimes significant historical disclosures. In 1949, the publication by Russian historian Torinan Kravets of a large body of Niepce-Daguerre correspondence preserved (since 1840) in the Russian Academy of Sciences still echoed that ancient feud, which has, repeatedly since then and

even as recently as 2004, been rekindled by various publications of such documents.

More generally, the keen interest that scientists initially took in the invention and its scientific applications explains the leading role that chemists and physicists played among early photo-historians. Beyond Arago, who authored, in addition to his famous 1839 speech to the French Parliament, several memoirs on the subsequent development of photography, a number of the leading academic scientists of the time contributed historical remarks and some essays on photography, its origins, and its significance, especially for the theory of light. These include the Englishmen John F. W. Herschel, David Brewster, and, more specifically for photographic methodology, Robert Hunt (whose *Treatise on Photography* (1841) and *Researches on Light* (1844) are, arguably, the most significant early publications on the subject), the Frenchmen Joseph-Louis Gay-Lussac, Jean-Baptiste Biot, the Germans Johann Madler, Alexander von Humboldt (and, later, Hermann Vogel, perhaps the single most influential scientific writer on photography in the nineteenth century), and the American expert on photochemistry John W. Draper.

These early accounts, more scientific than technical, paved the way for at least two subsequent kinds of "scientific" histories of photography. One was embedded in the larger genre of popular science, represented by encyclopaedias, magazines such as *The Scientific American* (founded in 1845), and illustrated surveys of the "wonders of modern science" of the kind that the French polymath Louis Figuier became famous for; these perpetuated a number of legends about the beginnings of photography but maintained its link to popular and general culture. The other was the later, far more specialized, and ever-widening investigation of what would come to be known as the "prehistory" of photography, which would often be associated with more strictly technical, or methodological, surveys of its development. In the last years of the nineteenth century, this trend, which may perhaps more properly be called technical, was represented by the British expert John Werge (*The Evolution of Photography*, 1891) and, above all, by the Viennese chemist Josef-Maria Eder, arguably the first major historian of photographic and imaging technologies, with his monumental *Ausführliches Handbuch der Fotografie* in four volumes (1891–96), followed by his groundbreaking *Geschichte der Fotografie* (four editions were published between 1895 and 1932). In the twentieth century, this brand of technological history was primarily pursued by German-language historians, from Erich Stenger to Helmut Gernsheim, though it had echoes in France (with Georges Potonniée) or in the United States (with Edward Epstean, originally a photo-engraver, who was also Eder's English translator); but its influence can be felt, until the end of the twentieth century, over much photo-history.

Although practitioners or advanced amateurs often had a hand in this scientific-technical brand of photohistory, as shown by the examples of Vogel, Werge, or Eder, another, more specifically professional, brand of photohistorians emerged very early on with the appearance of the first specialized treatises, or handbooks. Daguerre himself had entitled his 1839 manual *Historique et description des procédés du daguerréotype et du Diorama.* While most of the handbooks published in the 1840s contained few historical remarks, the formation after 1850 of more self-conscious professional organizations and the appearance of the first specialized magazines (in France, the U.K., and the U.S.) was accompanied by the publication of more ambitious treatises that more and more often included several historical chapters. One of the very first such compendia was the American Henry Hunt Snelling's *The History and Practice of the Art of Photography*, published in 1849, but it was soon followed by a host of competitors (such as, in the U.S., John F. Towler's *The Silver Sunbeam* and Marcus A. Root's *The Camera and the Pencil*, both published in 1864). The Société héliographique (founded in 1851, replaced in 1854 by the Société française de photographie), the Royal Photographic Society, formed in 1853, or the American "daguerrean" associations, each of which started publishing a magazine between 1850 and 1855, all busied themselves, and increasingly with time, with historical investigations. Writers such as Ernest Lacan in France or H.H. Snelling in the United States came to be regarded as authorities on the subject by their peers. Indeed, this burgeoning historical, technical and critical curiosity cannot be separated from the campaigns waged by leading professionals (and some devoted amateurs) to establish their art, or their commerce, on a firmer cultural basis—in short, to legitimize photography, and to rally, towards this goal, the support of unified and coherent professional constituencies. Lacan, Snelling, and their likes were neither great scientists nor careful historians; their writings were eclectic, often second-hand, sometimes full of errors; they were prone to nationalist claims and parochial arguments on the universal usefulness of their activity; but in the second half of the nineteenth century, they probably best embodied the emerging self-consciousness of a "photographic field" that sought both recognition by the academies and a certain measure of autonomy and self-reliance. Moreover, this trend is important in that it set a model for later campaigns for the recognition and institutionalization of photography, photographic art, or photographic education, which, as in the example of Alfred Stieglitz's Photo-secession, most often included a strong interest in the history of photography and an equally strong doctrine about how it should be written. Even the typical eclecticism of much

20th-century writing on photo-history may, arguably, be ascribed to this professional model.

To complete this survey of nineteenth -century photo-historians, it must be noted that aside from the scientific and professional writers, there were a few attempts —though not many— at more cultural, or philosophical, interpretations of the invention of photography. Some important accounts of photography's beginnings were thus penned by a few artists and art critics —such as the Frenchman Francis Wey—, or essayists and writers such as the Frenchman Charles Baudelaire, the Englishwoman Elizabeth Eastlake, or the American Oliver Wendell Holmes. It is surprising to see how much these early, often bold, commentators foreshadowed the later, more celebrated theses of twentieth-century critics such as Walter Benjamin or Roland Barthes. Until the end of the century, however, photo-history, like photography itself, remained very much the province of aficionados and professionals, while the general public had to be content with brief overviews placing it among the wonders of the century.

Though this entry cannot concern itself with the many succeeding generations of photo-historians after 1900, some remarks are in order as to how these later writers participated in the changing perceptions of nineteenth-century photography. To be sure, the major shift was from the perception of photography as invention to its recognition as art, and that paradigm change was deeply influenced by the crusades of virtually every avant-garde from Modernism to Conceptual art, as well as the strategies of influential collectors and then museums. Photo historians participated, often actively, in this shift, a major example being Beaumont Newhall, art historian turned curator of photography at New York's Museum of Modern Art (MOMA) and then the single most influential photo-historian of the twentieth century, who increasingly regarded the history of nineteenth-century photography as a history of pictorial expression, rather than one of technology. At the end of the twentieth century, the training of art historians routinely encompassed photography, and especially its "primitives," by now firmly established on the art market and in the artistic canon; ever-more expansive exhibitions and monographs were devoted, largely by historians with a training in art history, to a growing number of early masters. But this inclusion of photo-history into art history, the subject of much passionate debate after 1980, must not be overestimated, and neither should the work of twentieth -century photo-historians be reduced to it. At least three other separate trends must be noted here. First, many collectors of early photographs were also experts on "photographica" (materials, objects, practices, etc.), and, from Gabriel Cromer to Helmut and Alison Gernsheim, Floyd and Marion Rinhart, or Michel Auer, they have not only kept alive an interest in the history of photographic technology but expanded it in many ways. Second, it must be stressed that, exactly at the same time as Modernist-inspired exhibitions of the photographic art pioneered its recognition in the 1930s, in Germany, France, and the United States, other perspectives on the early history of photography emerged, in the very same countries, from the inspiration of folklore studies, social history, and sociology. Examples include, in the United States, Robert Taft's *Photography and the American Scene* (1938), but, more decisively, the important German works of Helmut Bossert and Heinrich Guttman, Heinrich Schwarz, Siegried Kracauer, and even Gisèle Freund, all of which left their imprint on the shorter and better-known essays by Walter Benjamin. This sociological trend, which, among other things, paid close attention to the reception, spread, and social uses of photography in the nineteenth century, has arguably exerted, if indirectly, just as strong an influence as the art-historical model did on later more cultural histories of photography, of the kind exemplified, in the 1980s and 1990s, by Naomi Rosenblum and especially Michel Frizot. Lastly, one cannot but observe, since 1990, that photography and photo-history have been increasingly understood as the matrix of a broader cultural history of images or visual culture, and that their appeal largely outreaches the realm of any specialized branch of cultural history.

François Brunet

See also: Talbot, William Henry Fox; Daguerre, Louis-Jacques-Mandé; Herschel, Sir John Frederick William; Brewster, Sir David; Eder, Joseph Maria; Werge, John; Vogel, Hermann Wilhelm; Société française de photographie; Société héliographique; Lacan, Ernst; Stieglitz, Alfred; and Wey, Francis.

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PHOTOLITHOGRAPHY

Photolithography is a photomechanical printing process that combines lithography with photography. Throughout its history, photolithography has included a variety of forms and printed image effects. Today, it is used in the printing of everything from magazines to soup can labels.

Lithography Lithography was invented in 1798 by a German author, Aloys Senefelder, who was looking for a practical way to publish his plays. Lithography is based on the principle that water and grease do not mix. The traditional lithographic process is as follows: On a flat printing surface marks are made in a greasy medium. The surface is dampened with water, which settles only on the unmarked areas, as it is repelled by the greasy drawing medium. Next, a roller covered with greasy printing ink is rolled over the surface. The ink adheres only to the drawn marks, the water repelling it from the rest of the surface. Finally, the ink is transferred to a sheet of paper by running the paper and the printing surface together through a special press.

From the beginning artists were intrigued with lithography, as they could draw and paint directly onto the printing plate. Many famous artists, including Pablo Picasso, Marc Chagall and Andy Warhol, have used this process. In the early 19th century lithography was usually monotone and not favored for commercial purposes. Stones were used as the printing surface, which was a cumbersome and expensive method. By the 1850s stones were replaced with metal plates— first zinc, then copper in the 1890s. After the American Civil War mass production of lithographs was possible. However, it wasn't until after the 1876 Centennial Exhibition in Philadelphia, where it received great exposure, that lithography flourished.

The first photolithographs As early as the 1850s, attempts were made to create lithographic printing surfaces by means of photography. While the ultimate goal was to create photographically realistic images, the first photolithographs could only create lines. These prints are often called *line photolithographs*. In this process, a document, such as a pen and ink sketch or hand written document, was photographed. The negative that was produced was used to expose a photographically sensitive sheet. The lines of the image would harden and the image was transferred to the printing stone or metal plate for printing. Transferring the image this way from a paper sheet, as opposed to drawing the image directly onto printing stone or plate, is called *transfer lithography*. From the 1860s, line photolithography was used to reproduce engravings, maps, architectural drawings and similar documents. In many early examples, it is difficult to near impossible to determine if such a lithograph was a photolithograph or a manual (by hand) lithograph.

While line photolithography was useful, there was strong desire to add tone and similar detail to the print. The earliest commercially viable technique that could create tone was the *ink-photo*, developed by a London firm, Sprague and Co., in the early 1880s. This was a transfer lithograph using the reticulation of gelatin to break up the photographic image into dots and squiggles. Once the image was photographically transferred on the gelatin surface, it was transferred to the printing stone or zinc plate and printed. This process is closely related to the collotype. The ink-photo was easier and cheaper to mass produce than the collotype, but the image was inferior. "Inc-Photo" and the company name is often printed is often printed on these prints. The ink-photo processes was used to illustrated many books.

Halftone photolithography With the introduction of the half-tone process, commercial printers could first make photolithographic prints with near photographic detail. Halftone is a photomechanical process that is applied to numerous printing processes, including relief (the common method of printing for 19th century publications), intaglio and lithography. It is often referred to as the *screen process* or *dot process*. With the use of special screens or glass with cross-hatched lines that break up the image, the halftone process translates the tones and detail of a photographic image into a printed pattern of tiny dots. Under magnification these dots are obvious, but from normal view they meld into what appears to be photographic tone. Typically, in the darker areas of the print, the dots are larger and closer together. In the lighter areas, the dots will be smaller and further apart. Examination of the photographically realistic image in a modern newspaper or magazine will reveal the halftone dots.

The halftone process was quickly applied to commercial relief printing, with half-tone prints commonly

appearing in newspaper and similar publications in the 1880s–1890s. The practical commercial application of halftone to photolithography was not so swift. Today, halftone photolithography is a dominant form of commercial printing.

DAVID RUDD CYCLEBACK

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PHOTOMECHANICAL: MINOR PROCESSES

The nineteenth century produced a great many photomechanical inventions that never became very successful. There were many reasons for this. The processes had to be practicable and they had to offer advantages over competing technologies, such as speed of operation and reduced cost. New processes could takes years of development at great expense and working conditions did not allow any significant control on important variables such as air temperature, humidity and levels of sunlight. The period literature is filled with comments to the effect that certain processes that made use of gelatin coatings "worked better on the Continent than in England," on account of the dryer weather. Technical manuals often described changes in chemical formulas based on the season, e.g., "during the winter months, a five percent solution of bichromate is recommended while two percent will suffice in the summer months."

There were also human factors such as a tendency for employees to resist changes that would have threatened their job security.

Etched Daguerreotype

Within weeks of Daguerre's announcement (1839) experimenters were trying to convert the daguerreotype image into a printing plate suitable for intaglio printing. The daguerreotype picture is produced by the deposit of mercurial vapor which combines with the silver and the polished surface of the silver surface itself. As the electro-chemical relations of these two metals are dissimilar, it was thought that the daguerreotype plate could be etched by the agency of the voltaic battery. Dr. Berres of Vienna, Fizeau in France, and Grove in England, succeeded either by direct chemical action, or by electro-chemical processes in engraving these plates, and in many examples the details were preserved "in a very charming manner." Claudet was very successful in engraving the daguerreotype picture by a modification of the process by Fizeau. The latter gilded the daguerreotype image, and then etched the parts not covered by the gold, which acted as a resist. The difficulty of biting the daguerreotype plate image to a sufficient depth to obtain the requisite ink-holding grain soon led to abandonment of the method.

Nevertheless, a number of publications were produced by this form of *etched daguerreotype.* The first one was by Joseph Berres of Vienna, *Phototyp nach der Erfindung des Prof. Berres in Wien,* (Vienna, 1840), illustrated with 5 plates from daguerreotypes, etched with nitric acid. Also of note are the *Excursions Daguerriennes, représentant les vues et les monuments anciens et modernes les plus remarquables du Globe,* (Paris, 1840–1843) in which three of the 111 plates were printed directly from daguerreotype plates by the Fizeau process.

Dallastype

This was a process for making relief blocks for typographic printing. It was probably the most successful invention of Duncan Campbell Dallas, who made half-tone blocks, and used a ruled screen instead of, or sometimes in combination with, his dallastint reticulated grain. The blocks were made of type metal, evidently cast in plaster molds taken from the gelatin relief. Dallas presented an example of his work to the *Photographic News* in 1864, calling it "dallastype." Dallas, however, appears to have changed the names of his processes as time went on.

Dallas advertised dallastype, dallastint and chromodallastint in W.T. Wilkinson's *Photoengraving* (ca. 1888–1890), but the only one that seems to have been used in books to any extent was dallastype. Some of the illustrations in Robert *Dickson's Introduction of Printing into Scotland,* 1885, were dallastypes. They were also used in Dickson & Edmond's *Annals of Scottish Printing,* published by Macmillan & Bowes in 1890. Pulls from some of the blocks in the latter book were given to William Blades by Dallas and are now in a scrapbook in St. Bride's printing library, London.

Expresstypie

A process for making grained half-tone blocks, invented by Cronenberg, ca. 1895. It used a grained screen, placed in contact with a gelatin dry plate, to make a grained negative. This was printed onto zinc or copper in the usual way. The grain had a reticulated character resembling that of collotype.

Goupil Gravure

Invented by Rousselon in France (ca. 1874) who de-

scribed his process as follow: "The value of our process of photogravure consists in the possibility of obtaining, by means of light, an etched copper-plate exactly like the ordinary copper-plate, and giving all the gradations of tone and half-tone, as drawn by nature in the ordinary photograph. Our process is founded on the discovery of a chemical substance which crystallizes under the influence of light, the crystals becoming larger the longer they are exposed to it. After exposure it only remains to make a deposit of copper, by means of the electric battery, on the crystalline surface, and thus a plate is obtained yielding proofs in which every detail and gradation of tone is faithfully reproduced."

Walter B. Woodbury, the inventor of the woodburytype, asserted that the Goupil process was based on a suggestion made by him to Goupil around 1870. According to Donald Cameron Swan, the process was based on his father's (Swan's) photo-mezzotint process.

Goupil and its successor, Boussod, Valadon, & Cie, used the process extensively for art reproduction, less frequently for printing original photographs. The overall excellence of a Goupil gravure –the density of black, the separation of tones, and the clear, crisp quality of the image– was not surpassed until the introduction of the Rembrandt photogravure process in 1894. Goupil gravures appeared in Seeley and Co.'s monthly art periodical *The Portfolio*.

Luxotype

A half-tone process patented in 1883 by Brown, Barnes and Bell, a Liverpool firm of photographers. A photographic print was pressed against a metal plate engraved with a stipple in relief, and thus became embossed with a stipple. It was then strongly lighted from one side so that the stipple could be photographed, and a negative suitable for making a half-tone block was thus obtained. A modification of the process was to rub a pigment into the depressed parts of the embossed surface of the print, so that it could be copied by direct lighting. Specimens can be seen in *Photographic News,* vol. 27, 1883.

Photoxylography

Name given to early photoengraving processes (from the early1850s on) that used the production of a photographic image on boxwood blocks as a guide for the engraver's knife, instead of using an image drawn by hand on the wood block. According to Stannard (*Art Exemplar,* 1859) the number of the *Microscopic Journal* for June, 1853, was the first and a thoroughly successful operation on an extended scale of this beautiful invention. Photoxylography was used by the *Illustrated London News* from 29 Dec. 1860. Pannemaker and his students are mentioned as the best practitioners of this art.

These techniques, in capable hands, gave beautiful results, but were inferior to true continuous-tone processes like collotype and aquatint photogravure, and the introduction of the half-tone process of the early 1880s made their practice largely obsolete.

Photozincography

A photolithographic process worked out by Col. Sir Henry James at the Ordnance Survey Office in Southampton, England, and at first, starting in 1859, simply a method of preparing a photo-lithographic transfer and applying it to a zinc plate, afterwards printed from. Direct prints from negatives were then made on the zinc plates. Photozincography may refer to a line or half-tone process.

Sir H. James read a paper to the British Association "On photozincography," in Sept. 1861. His first successful photozincograph was a reproduction of an etching, in 1859. A facsimile of the *Domesday* book, or ancient record of the Survey of English lands, ordered in 1086 by William the Conqueror, followed later in 1859.

Luis Nadeau

See also: Collotype; Half-tone Printing; Heliogravure; and Woodburytype, Woodburygravure.

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PHOTOMICROGRAPHY

Photomicrography is a hybrid innovation that grew out of the convergence of the novel nineteenth-century technologies of photography and microscopy. Although Victorians occasionally used the terms photomicrography and microphotography interchangeably, the photographic process was different for each. Microphotography involved taking a photograph of a large object (a portrait, page of text, or anything easily observed with the unaided eye) and reducing it to microscopic dimensions for viewing with the aid of a microscope. Photomicrography used the microscope to photograph a magnified image of microscopic-sized specimens (e.g., algae and other minute organisms, insects or their parts, animal and plant tissues); from these photographs enlarged prints and magic lantern slides could be prepared for both the advancement of knowledge and entertainment. Owing to its usefulness as a scientific laboratory tool, photomicrography endured through the Victorian era and after.

In England in 1802, Thomas Wedgwood and Humphry Davy first captured images of objects using a microscope with sunlight as the light source and pieces of white leather sensitized with silver nitrate. By the mid- to late-1830s, William Henry Fox Talbot had experimented with photomicrography using his "photogenic drawing" salt print process (Talobotypes/calotypes) producing images depicting the microscopic structure of plant sections; other English workers also used this technique, but Talbot's process did not adequately convey the fine detail of the original microscopic image. This technique did permit relatively easy duplication of images, however. Also in England around 1840, London surgeon and microscopist Jabez Hogg produced photomicrographs of biological specimens as did Manchester optician and inventor John B. Dancer, although the latter is better known for his microphotographs of famous people and scenes.

Continental Europeans were more prominent in the pursuit of photomicrography as a laboratory tool than their English contemporaries owing to their adoption of the daguerreotype. In 1840, the Viennese physical scientist Andreas Ritter von Ettingshausen produced wonderfully sharp daguerreotype images of microscopic cross-sections of botanical specimens, as did his contemporary the Viennese anatomist Josef Berres.

The Paris physician Alfred Donné and colleague, Léon Foucault, produced in 1844–45 the first biomedical textbooks to be illustrated with engravings made from his daguerreotype photomicrographs (*Cours de Microscopie Complémentaire des études Médicale, Anatomie Microscopique et Physiologie des fluids de l'économie* and *Atlas du cours de microscopie exécuté d'après nature au microscope daguerreotype avec M. Léon Foucault).* Included were images of salamander blood, pollen grains, and starch granules.

Daguerreotypes had the advantage of showing fine detail, unlike calotypes, but they were not readily reproducible in large numbers. The development of the wet collodion process overcame this obstacle, for it allowed prints of photomicrographic subjects to be produced in quantity permitting mass distribution in scientific publications, such as the pioneering illustrations contained in the English *Quarterly Journal of Microscopical Science* during the early 1850s. The dry-plate, or gelatino-bromide process, formulated by Dr. Robert L. Maddox, one of the Victorian era's great English photomicrographers, did much to popularize photomicrography and to make it more convenient. Other scientists advanced photomicrography through their publications and research. Most notable among them were Joseph von Gerlach of Erlangen, who wrote a treatise on *Photography as an Aid to Microscopic Research* (Leipzig, 1863), and Berlin bacteriologist and physician, Robert Koch. In 1877, Koch took the first photographs of bacteria; four years later, at the International Medical Congress in London, he displayed a series of photomicrographs of bacterial cells and tissue sections that aided in the dissemination of his sophisticated ideas on the germ theory of disease and helped silence skeptical colleagues. At the close of the century, almost all that was known about medical photography and photomicrography in Europe was contained in Albert Londe's *La photographie médicale. Application aux sciences médicales et physiologiques* (1893).

In America proponents of scientific photomicrography were supported not by universities or research institutes, as their counterparts in Europe, but by museums, which were then the intellectual equivalent. The Smithsonian Institution in Washington, D.C., published Dr. John Dean's research concerning the gray substance of the medulla oblongata and trapezium; this 1864 work was illustrated with photomicrographs of neuroanatomical sections. The recognized doyen of American biomedical photomicrography, however, was Dr. Joseph J. Woodward of the Army Medical Museum (AMM) also in Washington. Woodward, a Philadelphia-trained physician who became a military surgeon at the beginning of the Civil War, assumed museum duties under the auspices of the Office of the Surgeon General in 1862 and remained in the museum for the next 20 years. The AMM would develop a reputation for its extensive use of medical photography along with applied art techniques to create permanent visual records of soldiers' injuries, ailments, and pathological specimens. Military personnel prepared microscopic slides and undertook all photographic work within the museum. He and the AMM fast became recognized internationally as the center for photomicrography in America at this time. These medical photomicrographs were in demand and exchanged for images produced by other photomicrographers such as Maddox in England and Gerlach in Germany.

Woodward's pursuit of photomicrography was grounded in two intellectual traditions. One was the published work of Donné, Hogg, Dean, and other European and American photomicrographic pioneers. The other arose from his unwavering commitment to the usefulness of the microscope as an aid to understanding the causes of disease. Woodward's knowledge and position aided the efforts of two assistant army surgeons, William Thomson and William Norris, who, using the wet collodion process, first took photomicrographs of pathological preparations in spring 1864. The specimens were prepared by Woodward and photographed through a Zentmayer microscope (the official U.S. Army instrument stipulated by Woodward). During the next two decades, Woodward himself produced thousands of photomicrographs depicting a dazzling array of pathological conditions and other biological specimens.

For Woodward, photomicrography was first and foremost a scientific tool. Although like many amateur microscopists and photographers he did capture in his photomicrographs the beauty of diatoms (phytoplankton that exhibited many beautiful shapes, appearances and arrangements) better than any one else, this aim did not fully interest him. Rather, he used these microscopic creatures as test subjects to determine the resolving power of his lenses; owing to his skills both as a microscopist and photographer, he was able to work at the absolute technical limits of the best equipment available. Woodward's Toner Lecture series presented in 1873 at the Smithsonian Institution is also exemplary of his scientific approach. Concerned by the structure of cancerous tumors and how adjacent tissue was affected, Woodward prepared a series of 70 lantern slides from the museum's collection of photomicrographs for his lectures. Not only did he wish to educate his medical audience through these novel visual media, but he also desired to show how his illustrations corresponded with the latest scientific findings of European histologists. In so doing, Woodward ably demonstrated how photomicrography was becoming a necessity in the laboratory setting.

Woodward's legacy to scientific photomicrography went beyond his own contributions, for the AMM spawned successors through the nineteenth century and beyond: Dr. George M. Sternberg used this technique in bacteriological studies of the blood of yellow fever sufferers in Cuba; army surgeon William M. Gray, museum microscopist and photographer, became known for his series of histological photomicrographs. By the close of the nineteenth century, photomicrography had advanced enough to record such intricate processes as the reproduction of cells and their nuclei by division (mitosis and meiosis), with chromosomes clearly visible.

Overlapping the activities of laboratory-based investigative scientists who used the microscope-camera combination as a powerful scientific tool were the activities of other Victorians who pursued photomicrography as an uplifting recreation or who, as avocational scientists, studied natural history (i.e., descriptive and inventory-based science). Microscopy, then, like photography, became a feature of polite Victorian culture, especially in England. The study of the microscopic world became genteel recreation for both men and women, as they peered at the teeming life in samples of pond water or at the beauty of a butterfly's scales. The natural revelations of the microscope bolstered religious viewpoints of God's infinite creativity and wisdom. Photomicrography fit nicely with this worldview as it could make tangible to many what only amateur microscopists previously could see. Numerous books existed which included plates of photomicrographs of minutely detailed examples of the plant and animal kingdoms, while extolling the virtues of photomicrography. In *Nature through Microscope & Camera,* for example, published by the Religious Tract Society of London, Richard Kerr bemoaned the fact that amusement had become the order of the day in later Victorian England at the expense of education. However, the evils of trashy novels, bridge parties, and football and cricket talk could be counteracted somewhat, he maintained, through the entertaining and civilizing power of the microscope, especially when it was equipped with a camera. Photomicrography was instructive, useful and an intellectual pastime that would be good for the nation. Commercial vendors also sold slide sets of preserved biological specimens for "amateurs" to photograph through their microscopes. Especially enchanting for photographers were diatoms owing to the distinct markings of these microorganisms, consisting of striations and concentric rings of dots. Equally intriguing was photographing snowflakes. In 1885, the American amateur photomicrographer, Wilson A. "Snowflake" Bentley, first photographed an ice crystal through a microscope; he would continue this work in sub- freezing weather for the next 40 years, producing about 4,500 photomicrographs, and helping to prove that no two snowflakes were the same.

The apparatus available for photomicrography ranged from the relatively simple and cheap to the most complex and expensive. Regardless of sophistication or cost, the hobbyist, serious amateur, and scientist alike used a similar combination of equipment for photographing through the microscope. Critical was the light source, which had to be intense and constant to compensate for the lack of sensitivity of photographic plates. Bright sunlight was effective. At the AMM Woodward was able to take full advantage of natural daylight because of Washington, D.C.'s, southern latitude and his use of a heliostat, which constantly tracked the sun. But those

who worked at night, or who did not live in sunny climes, could not avail themselves of this form of light. In such circumstances, electric light, kerosene and oil lamps, or the combustion of magnesium ribbon were used. The preferred artificial illumination was a combination of oxygen and coal gas or hydrogen ignited under pressure to heat a block of lime white-hot to produce limelight. Of course, a major disadvantage of this method was the likelihood of setting wooden photographic equipment and furnishings on fire.

As important was the work area, which would probably incorporate a darkroom, where photomicrography was undertaken. The location had to be free from vibration to avoid obtaining blurred images (exposures could take upwards of several minutes); precautions were observed such as suspending equipment from beams, or equipping table legs with rubber shock absorbers. Similarly, it was recommended not to undertake photomicrography at times of the day when heavy traffic was moving in nearby streets. Initially, the choice of compound microscope was not itself crucial, although later in the century the better the fine focusing mechanism and lenses on the instrument, the sharper the image to be photographed. Instruments manufactured in England were often bulky, with body tubes up to nine inches long, compared with more compact continental European microscopes that typically had shorter body tubes of approximately six inches. Perhaps because of this difference in construction, English photomicrographers usually aligned the microscope, bellows, and camera/plate assembly horizontally; the convention of most Europeans was to align their equipment vertically. The later Victorian period saw the adoption of European techniques owing to the domination of German laboratory science and the attendant rise of optical manufacturing companies such as Carl Zeiss and E. Leitz, which produced superior quality, standardized photomicrographic apparatus.

Following the Victorian era, improved optics for both cameras and microscopes, newer photographic techniques and equipment such as faster speed black and white roll film, 35 mm color slide processes, motion picture and digital technologies, led to higher quality, more detailed and more revealing photomicrographs. Yet these later improvements should not overshadow the revelations and achievements of this original nineteenth-century convergent technology. Just as important was the lasting philosophical impact that photomicrography had on the scientific mind. While art (sketching and painting) as applied to medicine and science would endure, laboratory scientists believed that photography through the microscope was more accurate than artistic drawings of specimens done laboriously by hand and from memory. In brief, photomicrography (and biomedical photography in general), like science itself, was perceived to be objective, free of human bias, and more truthful; such rhetoric did much to propel all three pursuits during the nineteenth century and later.

J.T.H. Connor

See also: Wet Collodion Positive Processes.

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PHOTOMONTAGE AND COLLAGE

Photomontage is created when an original composite image is photographed to produce a seamless unified effect in order to turn out duplicate photographic copies. Montage is from the French "monter," meaning to mount. It is a hand process used to alter camera-derived images and introduce subjectiveness into a photograph. Generally, existing photographs are cut apart and selected portions are glued onto a flat surface and rephotographed. The widespread use of photocollage had its start in early photo albums before the days of mass production. In these personal albums, photographs and flowers were pasted onto pages and later hand painted or sketched on by the album's creator. Photomontage on the other hand, was a thing people in mourning created to ease their grieving. The photomontages usually consisted of cartes-de-visite and montaged portraits on to elaborate photographic backgrounds and typically included a photograph of a picture frame on cabinet. From these creations came the development of montaged multi-view panels which were then re-photographed and sold as cartes-de-visite, thus creating the market.

In 1863 André Disdéri applied for a French patent for his "carte mosaïque" (mosaic carte). The precedent was the composite images of celebrities and eminent personalities that were commonly circulated by means of the printing press. Disdéri's mosaic cartes, featuring thematic portrait composites of actors, dancers, generals, the French royal family, and social groups received enthusiastic public support. Each mosaic carte could be comprised of twenty to one thousand faces. They served as advertising (studio address appearing on either the front or back of the carte) and people could come to his "Palace of Photography" and also buy a carte of their favorite personality or have one of their own made by the man who photographed everyone from Napoleon III to the Pope. The introduction of the cabinet style photograph starting in the 1860s offered the mass-market a larger image area that the carte-de-visite and encouraged more photographers to experiment with combining images.

As in combination printing, montage was devised to overcome aesthetic and technical limitations. The concept of removing a photograph from its original context and placing it into a new one has had profound effects on the viewer's willingness to accept as "real" visual information supplied by the photograph. The mosaic broke the rules about representing perspective, point of view, space, and time, and yet the public willingly accepted these radical changes as long as they remained photographically anchored. The term, photomontage, was not introduced until after World War I by the German Dadaists.

Collage (from the French *coller*, to glue or paste) is the practice of cutting and pasting together of two- and/or three-dimensional materials, including lace and dried flowers and plants, to form a new visual composition. In creating a collage no effort is made to conceal that the result has been assembled and is not a seamless image. Collage can be seem in Victorian family albums that incorporated the hobbies of appliqué print and watercolor that allowed people, almost exclusively women, to privately alter and interpret photographic images.

Another form of collage involves bringing together disparate images to form a new meaning. During the American Civil War, the United States Post Office Dead Letter Office assembled groups of photographs in a grid fashion and displayed them in hopes that someone would recognize a face and claim the photograph. This practical strategy of disseminating would eventually be adopted into artistic and scientific photographic practice.

Lady Filmer (1840–1903) was an aristocratic amateur who made early collages that combined carte-de-visite portraits with watercolor designs of butterflies and floral arrangements. These pieces, with their occasional sexual allusions, disclose a pre-Freudian spirit of unconscious association, a component of mental life not subject to recall at will, which required a new form of expression because the language for such a discussion had yet to be invented. Since such work was done for personal reasons and was not publicly exhibited or written about, it appears that there was no nomenclature to discuss what was being done. This sort of individual interaction with photographs did allow people with some artistic skill to reorient images in time, space, and meaning. Collage positioned photography to investigate free association, to use cut and paste methods to examine dreams and enable the unconscious, repressed residue of socially unacceptable desires and experiences to be consciously presented. The technique is the forerunner of surrealistic practices and images developed in the twentieth century.

Hand-coloring was widely practiced from photography's earliest days of to overcome its initial inability to record color. For an extra fee, the operator made notes about the color of the sitter's clothes, eyes, and hair. Color was hand-applied, based on these notations, directly on the finished image, which covered every process including daguerreotypes, paper prints, and tintypes. By 1843 John Plumb, Jr. was offering "color" portraits in his chain of studios by electroplating portions of the finished daguerreotype.

Alfred H. Wall promoted the practice in his *Manual of Artistic Colouring as Applied to Photographs* (1861). Wall, a former miniature and portrait painter, said that painting over a photograph was no more unacceptable than painters such as Leonardo and Titian painting over the *abbozzo*. Wall complained that artists repudiated hand-colored photographs because they were not paintings and that photographers rejected them because

they altered the camera's image. Wall saw no reason for censuring work that combined "the truth of the one with the loveliness of the other."

Composite and hand-colored images required time and deft handwork. This addition of time was seen as a way to make photography less mechanical and more artistic. This in turn increased a photograph's value and encouraged photographers to portray subjects previously reserved for painters. As photographs were not precious objects, some people took the liberty to interact with this supposedly fixed form of representation and interjected their own personal feeling about the subject. This began an ongoing exploration of fabricating illusion that expanded the photographic syntax to include subjective reality and how the tension between the two could produce new meaning. Hand-coloring and mixed media methods began to extend and transform the photograph into areas that conventional photography could not go. Conceptually, it acknowledges a photograph is not a fixed entity, but one that is open to continuos process that can accommodate change, expansion, and innovation.

ROBERT HIRSCH

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PIAZZI SMYTH, CHARLES (1819–1900)

British astronomer

Piazzi Smyth (who used his middle name together with his surname) was born in 1819 in Naples, Italy. He seemed destined for fame in the field of astronomy. Named after the Italian theologian and astronomer Giuseppe Piazzi (1746–1826), he was the second son of Rear-Admiral William Henry Smyth, F.R.S., who had once been president of the Royal Astronomical Society, and Annarella Warington. Piazzi Smyth received his scientific education early, first in his father's observatory at Bedford and then at the Royal Observatory at the Cape of Good Hope, South Africa, where he assisted Sir Thomas Maclear from 1835 to 1845. His first calotypes date from around 1843; it is likely that he learned the technique from Sir John Herschel, a close family friend who was also in Cape Town at this time. His interest in photography would also have been nurtured in the circle around his father's close friend Dr. John Lee, which included William Henry Fox Talbot, James Glaisher, and Sir David Brewster; and at the salons of astronomer and amateur photographer Lord Rosse.

In 1845 Piazzi Smyth was named Astronomer Royal for Scotland, and the following year became Regius Professor of Practical Astronomy at the University of Edinburgh. Though hampered throughout much of his career by the chronic underfunding of the Calton Hill Observatory (recently placed under treasury control), Piazzi Smyth devised brilliant projects relating to the observation, measurement, and documentation of astronomical phenomena. One of the earliest of these initiatives was an expedition to Tenerife, the largest of the Canary Islands. In June 1856—accompanied by his new bride, Jessica Duncan—Piazzi Smyth went to the volcanic island to test his theory that the stars would be better observed from high points above ground-level pollution, to observe the solar spectrum, and to measure the thermal radiation of the moon, thus establishing the modern practice of high-altitude observation and pioneering spectroscopy and infrared astronomy. He also undertook a significant photographic documentation project, resulting in the first stereoscopically illustrated book: *Teneriffe, an Astronomer's Experiment; or, Specialities of a Residence above the Clouds* (1858), which contains 20 plates (from wet-collodion negatives on albumen paper) and sold for 21 shillings. Piazzi Smyth chose the stereoscopic format because the equipment was comparatively portable and because he felt it provided maximum accuracy and objectivity while minimizing the risk of accidental flaws and tampering. Far more effectively than the drawings and paintings he also executed on site, Piazzi Smyth's photographs demonstrated the clarity of the atmosphere at high altitude. Upon his return from Tenerife, he turned over the printing to Glaisher, a fellow astronomer and accomplished photographer, and A. J. Melhuish, photographer and optician. Publisher Lovell Augustus Reeve then supervised the production of an edition of 2,000, which entailed the mounting of 40,000 stereo pairs onto pre-printed pages. Jessica Piazzi Smyth printed additional photographs for subsequent official reports of the expedition (1859), and Piazzi Smyth employed another method of photographic reproduction—a photoglyphic engraving etched by Talbot—in an account published the *Edinburgh Astronomical Observations* (1863).

Piazzi Smyth's work in Tenerife earned him a Fellowship in the Royal Society, but his next major project—an excursion to Egypt to measure the Great Pyramid of Gizeh—was not as well received, largely owing to his expressed intent to prove the divine basis of the pyramids' construction. Piazzi Smyth had first encountered this theory in the writings of one of its most vocal proponents, John Taylor, whom he met through either Herschel or Lee. Piazzi Smyth was intrigued, and eventually obsessed, with the idea that the seeming coincidence of its measurements (the "sacred cubit") with the earth's polar axis reflected God's intervention—and that he could demonstrate this with modern instruments of quantification.

Photography was one of these tools, and despite severe financial limitations Piazzi Smyth made several extremely important advances in Egypt, where he applied new techniques that had not yet been tested in the field. The gear that he and his wife packed for their journey in November 1864 included a dry-plate apparatus, a pair of small-format cameras wet plates, magnesium wire, chemicals, a dark tent, a microscope, and various measuring implements. Piazzi Smyth specially designed the small cameras to produce miniature (1 inch square) negatives on 1 x 3-inch glass microscope slides, and to keep out the dust that caused problems for wet collodion. (He had experimented with the miniature format in Russia in 1859, achieving instantaneous effects in urban scenes and englarging them later.) To document his measurements of the pyramid's exterior, he took photographs that include rods and figures for scale. But to photograph the dark interior chambers, he generated bright light by employing magnesium wire, which had been discussed in the photographic journals and presented by Brewster at the March 1864 meeting of the Photographic Society of Scotland in Edinburgh.

Returning to the U.K. with 166 images (about half on dry plates and half on miniature wet collodion plates), he set about making enlargements, breaking with current precedent by cropping selectively. Prints were exhibited at the September 1865 meeting of the British Association for the Advancement of Science, held in Birmingham, and the images reached a much wider audience through lantern-slide lectures. Piazzi Smyth's ideas about the pyramids attracted a following of religious fanatics but were viewed with suspicion in scientific circles. The Royal Society's dismissive attitude prompted Piazzi Smyth to resign his fellowship in 1874, but he continued to make valuable contributions in various fields, spectroscopy in particular. In 1876 he designed another special small-plate camera, this time to produce systematic photographs of cloud formations—the first application of photography as a serious tool for meteorological research. Piazzi Smyth retired from his professorship and his post of Royal Astronomer on 18 August 1888, and he and his wife settled near Ripon, in Yorkshire. There Piazzi Smyth adapted his solar spectrograph for photographic work and recorded the entire range of the solar spectrum. He also resumed cloud photography, making 500 photographs in three years and presenting examples to the Royal Society and to the Royal Society of Edinburgh. He died on 21 February 1900.

BRITT SALVESEN

Biography

Charles Piazzi Smyth was born in 1819 in Naples, Italy, the son of amateur astronomer Vice-Admiral William Henry Smyth. He received his scientific education in his father's observatory at Bedford and then at the Royal Observatory at the Cape of Good Hope, South Africa (1835–45). In 1845 Piazzi Smyth was named Astronomer Royal for Scotland, and in 1846 became Professor of Practical Astronomy at the University of Edinburgh. He published the first stereoscopically illustrated book, *Teneriffe, an Astronomer's Experiment*, in 1858, and in subsequent trips to Russia (1859) and to Egypt (1864) continued to employ photography for documentary purposes, putting into practice theoretical improvements such as dry plates, miniature negatives, and magnesium flares. In his final decades, Piazzi Smyth was somewhat alienated from the British scientific community, largely owing to his eccentric views on pyramidology. He resigned from the Royal Society in 1874, retired from his professorship in 1888, and settled in the Lake District, where he designed cameras suitable for spectroscopy and cloud photography. He died at Clova, his Yorkshire home, on 21 February 1900.

See also: Archaeology; Artificial Lighting; Astronomy; Books Illustrated with Photographs: 1850s; Books Illustrated with Photographs: 1860s; Camera Design: 3. 1860–1870s; Camera Design: 7. Specialist and novelty cameras; Meteorological Photography; Mountain Photography; Royal Society, London; Science; Sky and Cloud Photography; Spectrography and Spectroscopy; Travel Photography; and Wet Collodion Negative.

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PICTORIALISM

Pictorialism was the vanguard movement in art photography from about 1891 to 1910. It was especially strong among photographers in the United States and Europe who established their reputations in an organized international movement. They banded together to establish photographic processes as art. The work of camera, composition and printing served related artistic ideals: the ascendancy of the individual over the mass, the emergence of the artist from the crowd and the value of scarcity.

Apart from the broad aim to make pictures by photography, almost nothing else about pictorialism is straightforward, certainly not its beginning or its end. The years 1891–1910 may signal the start and finish of the art movement, but not the limits of the everyday word "pictorial." This is partly a problem of terms: pictorialism was an end-of-century organized movement, whereas the word "pictorial" had been in general use in the 1860s and simply meant looking like a picture. In the 1890s art photographers who wanted to demonstrate their modernity turned "pictorial" into a contemporary artistic "ism." However, the arguments that tore the art movement apart stemmed from the general meaning of the word "pictorial"—looking like a picture. Increasingly, no one could agree what a picture should look like. The nature of pictures suddenly became uncertain, and so did pictorialism.

Henry Peach Robinson described the nature of the pictorial in photography in the 1860s. He wrote eleven books on art photography and the most popular, *Pictorial Effect in Photography*, was printed four times from 1869–1893. Pictorial effect was achieved by making photographs look picturesque, overlaid with the early 19th century individualism of Romanticism and combined with the mid-century fashion for storytelling pictures. Pictorial effect depended on adapting the forms and styles of academic painting, including the architecture or structure of the image. Robinson used combination printing to build his pictures in the darkroom, but his interest in Pre-Raphaelite painting and its patchwork of parts meant that the space in his finished photographs often looks strange and unrealistic, though produced by purely photographic means.

In the 1880s Robinson's piecemeal style was condemned by Peter Henry Emerson. Both men believed that photographic techniques could be used to make art, though they emphasized different procedures. Emerson believed that a photograph must be made in the camera rather than in the darkroom. Ideally, this meant creating the picture in a single composed shot with no faking and dodging. Emerson replaced the word "pictorialism" with "naturalism" which claims to represent the actual world as it appears before the camera. But Emerson was just as obsessed as Robinson with art and personal expression, though the ways of achieving both were changing. During the 1880s, there was a shift away from anecdotal pictures, and this is evident in Emerson's work. Some of the earliest images published in *Life and Landscape on the Norfolk Broads* (1887), such as "The Dame School," tell stories, but most of them do not. Emerson gradually dispensed with content. The late images, published in *Marsh Leaves* (1895), are dominated not by subject matter but how photographs represent light and shade.

By the late 1880s, art photographs were not tied to storytelling paintings. They could be meaningful on their own, especially if they were atmospheric, impressionistic or symbolic. Moreover, what caused so much experimentation and excitement in the 1890s was the sheer number of techniques available to turn photographs into art.

Although the pictorialists needed mass-produced photographic materials, they pretended to stand apart from automation, and celebrated hand-work or other skills. Pictorialists used the best materials available in the High Street, but disdained the ordinary commercial or industrial nature of photography. They intended their photographs to be completely different from the objectivity sought by scientists and social recorders. The emphasis was not on utility but on expression. As artists, they also set out to be utterly different from snapshooters.

Antony Guest, in his book *Art and the Camera* (1907), claimed that the highest aim of every amateur was to glimpse the "Dream City of Art." This was the distant, magic home of the artist, that "gifted being for whom there is more richness in life than for ordinary mortals." To signal that they placed feeling and imagination over the authority of fact, the pictorialists embraced soft focus and the evocation of mood. Though engaged in dreaming, they also knew they had to express this in new photographic techniques. They became experts in combining different graphic devices. When art photographers pictured themselves at work on a print, which was rarely, it was to demonstrate their skill in precise and difficult processes. Alvin Langdon Coburn photographed himself working at an etching press, and John Cimon Warburg pictured himself working on the oil pigment of a gum print.

The pictorialists' program was romantic-expressive. It was concerned with identifying and staying close to the supposedly eternal standards of nature, beauty and truth. It was optimistic about the world it surveyed and wished to conserve. However, by 1908 the pictorialists were in open conflict about the nature of their art. The movement began to break up, signalled by the collapse of the Brotherhood of the Linked Ring in London in 1910. That year, more divisions surfaced in the United States. Alfred Stieglitz organized The International Exhibition of Pictorial Photography in Buffalo, New

Delton, Louis-Jean. Mr. Brower's American Trotters.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum,

York, to display work from 1894–1910. However, he included only the work of his own circle known as the Photo-Secessionists. The offense taken by the counter-Secessionist organization, called the Photo-Pictorialists of America, was so great that Stieglitz decided to take no further part in advancing pictorialism. The rows among other pictorialists carried on, with further splits evident in exhibitions designed to keep pictorialism alive to the present day. Despite its popularity, or because of it, pictorialism's contribution to art photography was largely ignored until the late 1970s. Recognizing its historical importance also meant acknowledging its ignominious end. In 1978 historian Weston Naef described pictorialism's late phases as "the most despised art movement of the twentieth century."

Since the late 1970s, there has been an increasing interest in pictorialism, with more books, exhibitions and auction-house sales of the work. Stieglitz and other Photo-Secessionists remain the best-known art photographers of the period. The orthodox history centers on Stieglitz and his circle and has altered little other than to recover a few neglected artists—significantly men whose careers were discernibly thwarted by Stieglitz, such as Fred Holland Day and Rudolf Eickemeyer Jr. That history repeats the aims of pictorialism laid down by its first advocates. It tends to repeat the self-assessments and earliest reviews of the movement as based in personal vision, with emphasis on the spiritual superiority of the artist in a materialistic world.

Of course, this history continues to separate photography as art from its increasing ease, cheapness and popularity. From the early 1890s, some photographers saw the mass production of easy-to-use cameras as a threat to art. Whereas once it had been possible to make art photographs only with whole- or half-plate cameras on a tripod, now people tried to achieve similar effects with hand-held cameras and negatives no bigger than a quarter-plate. In theory, if these newcomers had the correct disposition they also had the potential to make art. In theory and in practice, as George Davison showed with "The Onion Field" (1889), an art photograph could be produced with a pinhole camera, with no lens or plate at all. Davison demonstrated that technology was irrelevant, since the basis for art was the romantic-expressive temperament.

Yet, despite the importance of character, technology was still a crucial factor in differentiating the artistic amateur from the snapshooter. Art photographers bought their own expensive equipment, furnished their own darkrooms (or used those of exclusive clubs), and produced individual and exquisite prints. In the 1890s, an enthusiast for hand cameras warned buyers against trying to "take" a landscape with a cheap camera without a shutter. The ownership of the landscape, even at the level of ideas, remained with those who were not only cultivated but also rich enough to afford elaborate plate cameras. It was important to stay up-market with equipment, or (like Davison) temper low-level technology with a superior understanding of composition and darkroom skill.

The mass production of photographic goods led inevitably to the popularity of photography as a pastime among the lower middle classes, and an increasing number of clubs and societies. The *British Journal*

Photographic Almanac for 1881 listed 20 societies, all in large cities in England. By 1891, this number had risen to 172 and, by 1901, had risen again to 229. Societies were also founded in towns and suburbs. The spread of clubs and societies throughout Europe and the United States meant a proliferation of art interest among amateurs, so the serious art photographers had to become much more exclusive.

Exclusivity could be achieved by being knowledgeable about art. Many ideas in art, such as aestheticism and naturalism, already had long histories in the 19th century, but the pictorialists tried to see their relevance to contemporary art. They studied recent versions of the arts of "ism": aestheticism, naturalism, impressionism, Japonisme, and symbolism. Pictorialists rummaged in these varied art styles for prescriptions and justifications to create for themselves an art movement that was primarily aesthetic.

Though satirized in the 1820s, aestheticism survived into the 1890s as the affected and extravagant cult of the beautiful that characterized the "Aesthetic Movement." In his conclusion to *The Renaissance* (1873), Walter Pater claimed that those with "sensibility" would find the most precious moments of life in "the desire of beauty, the love of art for art's sake." In Britain, aestheticism in art was first ridiculed because of its dandyism and then tainted by its association with the perceived decadence of Aubrey Beardsley and Oscar Wilde. Nonetheless, an enthusiasm for "art for art's sake" was important in dislodging Victorian moralizing and anecdote from art and photography.

Naturalism was chiefly concerned with representing an idealized country life, as if it actually existed and could be shown directly, seemingly without mediation or manipulation. The countryside and country folk appeared to be both natural and heroic. The art movement developed in Europe and the United States from the 1820s. Towards the end of the century naturalism was continued in Britain in the paintings of George Clausen, who was a friend of Peter Henry Emerson. During the same period in the United States naturalism flourished in the paintings of Albert Bierstadt, and in the photographs of Rudolf Eickemeyer Jr., and in Arthur Scott's photographs for John Coleman Adams's *Nature Studies in Berkshire* (1899).

Even as it developed, Impressionism was the most famous of all French art movements. Although controversial in the 1870s, "impression" was quickly (and loosely) adopted as a way of viewing the world. The term was not confined to one style of depiction, but described an attitude to art that had already been made famous by Emile Zola in 1866, when he remarked that a work of art was "a corner of creation seen through a temperament." Photographers latched onto that idea even more than the methods of Claude Monet or Edgar Degas. The word "impression," as long as it was associated with artistic temperament, became the most widely used term—sometimes of abuse—in *fin de siècle* art photography. Part of the problem in Britain, at least, was that the word was linked with James Abbot McNeill Whistler, whose impressionistic "Nocturnes" had been so controversial in the 1870s, but who was feted by the time he died in 1903. A particularly rich example of his influence can be seen in Edward J. Steichen's "Flatiron" (1907). Steichen achieved his effect by making a print from a complex mix of blue pigment gum bichromate and platinum salts, which required considerable technical mastery.

Pictorialists liked the decorative pattern and order of Japonisme. It is characterized by a pronounced flatness of the picture, high skyline, or the abstract nature of the overall image. It was made popular in the United States (among others) Arthur W. Dow's *Composition* (1899). Japanese woodcut design is common in pictorial photography, as in James Craig Annan's "The White House" (1905) and Alvin Langdon Coburn's "Wapping" (plate 10 from *London*, 1909).

Symbolism was a highly charged, eroticized art form in Europe. The pictorialists translated it into something gentler. It had a pronounced mystical air, as in George H. Seeley's "Glowworm" (1903/08), Clarence Hudson White's "The Bubble" (1898/1905), and Anne W. Brigman's "Spirit of the Glacier" (1906). In Britain, Alvin Langdon Coburn was captivated by the mystery religion of Rosicrucianism and illustrated the mystical poet and playwright Maurice Maeterlinck's *The Intelligence of Flowers* (1907).

Though fraught with ambiguity and conflict in their practice, art photographers nevertheless modeled themselves on the art establishment. They held annual "salons," put their prints up for sale, judged each others' work, and awarded medals. They kept up a continuous flow of critical opinion and confirmatory acts. They took portraits of each other, wrote reviews, and formed alliances. An accumulation of opinion and reputation flowed within and across continents. Their activities created a "hothouse" atmosphere, designed to keep out what they felt to be the enemies of art. The density of material flowing in the system appealed to the Romantic standards of truth and beauty, which was opposed to the banal and manufactured.

This clamour for prestige among art photography has been harshly judged by historian Ulrich Keller. However, what is important about his work, and perhaps suggests why it has been somewhat overlooked in the standard books on the pictorialists, is that he moves away from taking them entirely on their own terms as artists. He insists not only on examining their contradictions, but also on placing them in the contexts of art production and consumption and business.

Attacking their aesthetics, Keller writes that the pictorialists were "charmed" by the high status "reserved for the artist/genius in Victorian times" and set their sights "on producing high-art works à la Titian and Rembrandt." However, the claims for art were not always based on the "old masters." Other favored models included popular contemporary (or still fashionable) artists such as Jean Baptiste Camille Corot, George Frederic Watts, and, above all, Whistler. Further, the pictorialists could not have accepted that their place was to stay with what Keller calls the "merely decorative" arts of the Aesthetic Movement, since they were contending for a new space for art photographs as *pictures*.

Keller also argues that in constructing their own fame, the pictorialists built "a prestige-oriented pseudo art world" on a medium with no stable position or history as an art form, and with negligible support from curators and collectors. The pictorialists' self-promotion was indeed similar to that of the art world, no doubt because of prestige. It could not have been for financial reward, since none of the practitioners was making serious money from art photography, and yet they continued to pursue it in their spare time.

The position of the pictorialists is complex, because most were middle-class professionals. Pictorialism was only a hobby and full-time camera work was extremely rare. Yet the attraction of mimicking high art becomes clearer if it is considered in terms of social class. Artistic production and promotion had no direct business significance and was largely concerned with membership of the correct social set. In London, the elite art photographers formed the Brotherhood of the Linked Ring in 1892, breaking away from the already elite (but inartistic) Royal Photographic Society. But despite their secession, art photographers were not bohemians seeking a place outside the market. On the contrary, they were themselves a niche market. The big photographic firms recognized the special cachet of art, and financed the amateur magazines to encourage art aspirations. They continued the same appeal in organized amateur exhibitions with special sections for the elite art photographers. For instance, Kodak's large exhibition in London in 1897 featured well-known British pictorialists such as Henry Peach Robinson, James Craig Annan, George Davison and Alfred Horsley Hinton. Furthermore, many of these photographers were employed in the trade. Hinton was a dealer in photographic goods and editor of *The Amateur Photographer* from 1893–1908; Annan was employed in his father's firm of portrait, commercial and industrial photography; Davison was directly connected with Kodak from 1889–1913, and was Managing Director of the company in England from 1900–07. Robinson was a professional portrait photographer and successful author. Other exhibitors included such famous members of the Brotherhood of the Linked Ring as Malcolm Arbuthnot, who married a Kodak heiress and managed the company's Liverpool branch, and James Booker Blakemore Wellington, who founded the company of Wellington and Ward, manufacturers of photographic plates.

The tendency to retreat into metropolitan and otherwise exclusive societies was matched in Europe in the Cercle l'Effort (Brussels) and the Trifolium (Vienna), and in the USA by the Elect (Chicago) and the Photo-Secessionists (New York). Such elite clubs were directly comparable to the exclusive gentlemen's clubs of high society. In addition, many of the leading members of these societies were unusually wealthy and highly educated. The Wiener Camera Club enjoyed the patronage of the Royal Family and aristocrats, as well as photographers of international standing and high status, including lawyers (Joseph T. Keiley), bankers (Robert Demachy), merchants (Theodor and Oskar Hofmeister), and heirs (Heinrich Kühn). Not surprisingly in such company, the emphasis was on stylish clothes, on gatherings in fine restaurants, and luxurious club accommodation.

The pictorialists agreed on their exclusivity. However, they scarcely agreed on anything else. They constantly wrangled among themselves about methods and styles. The movement began promisingly in 1891 with an art photography exhibition organized by the Trifolium group in Vienna, but personal rivalries meant it ended badly in London in 1909–10 with the self-destruction of the Brotherhood of the Linked Ring. Pictorialism then rapidly disintegrated as a forceful movement.

The seeds of discord were already present from 1889. Despite the importance of the final pictorial effect, this was nevertheless related to technical choices, and art photographers engaged in bitter disputes over processes. The controversy over printing began in 1889, when Emerson caused a scandal by advocating differential focusing, and thereby broke with sharp imagery. The arguments were complicated by those who advocated print manipulation in the darkroom and those who believed the photograph should be printed "straight," insisting on the purity and integrity of the chemical process. The opposing factions never resolved the matter in arguments stretching over twenty years, and from this distance the differences between them are less striking than their similar aim—to make rare and unique prints that were remote from everyday snapshots, or illustrations printed in magazines and papers by off-set lithography.

Divided by technique, the two main camps held some ideas in common. For example, both camps declared that truth to nature was the most important ideal, and neither believed this should be mistaken for realism, or too much detail. However, one camp declared that it was the duty of the photographer to improve on reality by any means possible in order to approach the ideal of nature. These means included staging scenes, altering

actuality, and combining or altering negatives in the darkroom. The leader of this group was Henry Peach Robinson, but he died in 1901, and then the chief exponents of such practices included such different stylists as Lydall Sawyer, Alfred Horsley Hinton, and Francis James Mortimer. Nature could also be improved by using one of a number of oil pigment processes, such as the gum print, which were invented and improved upon in the first years of the 20th century. These enabled such different photographers as Robert Demachy, Dudley Johnston, Leonard Misonne, and Edward Steichen to use a brush to coat the paper with oil pigment. They applied as much pigment as they liked to make images that were varied in draughtmanship and rich in color, often looking like lithographs. Opponents of those "handwork" methods referred to such images disparagingly as "fuzzygraphs."

The opponents of "handwork" also believed that art resided in nature but thought that true artists should be able to see the composition before them in the groundglass screen of their camera. They advocated "straight" or "pure" photography, with the minimum of darkroom interference. Since the 1880s, the leading proponent of "pure" photography was Emerson, who never joined any of the secessionist art societies but was extremely influential. He claimed that the mass market was spoiling photography, declaring the order of rank for pictorial representation to be oil paintings first, followed by photogravures and finally "a good photograph, one which is a picture, and which is printed in platinotype." Emerson's ideas were carried forward by Stieglitz and many other pictorialists, including Frederick H. Evans, George Davison, and Alvin Langdon Coburn. These photographers liked to make platinum prints, which had a metallic sheen, or photogravures, which could look like engravings or etchings.

Arguments between the "pure" and "handwork" camps helped to destroy late pictorialism, but other factors were involved. In addition to the squabbles among its advocates, pictorialism was already in a weak position. With some justification, the death of pictorialism as a form of modern art stems from its politeness. Consistently, pictorialism is consigned to the margins because of its attachment to the drawing-room values seen in the art of the late Victorians and Edwardians. Its advocates wrote dull appreciations according to increasingly old-fashioned formula. However, pictorialism continued to flourish in camera clubs and international exhibitions because it was pleasant and not too modern. Its popularity increased in the clubs because it helped produce an idealized or improved view of a utilitarian or mechanized world. Of course, once pictorialism became popular, its appeal to the famous *fin de siècle* art photographers ended.

Pictorialism suffered even more when one of its methods, combination printing, was put to new use—but not in art. When it was dangerous or forbidden to use a camera outdoors during wartime, combination printing was widely used to fake war scenes that were useful propaganda; no doubt that contributed to pictorialism's sudden demise in depicting truth to nature after 1918.

The more pressing problem by 1910, however, was that pictorial aesthetics seemed outdated. The Victorian ideals, the comfortable drawing-room life, which is so evident in Edwardian pictorial photography, were no longer the appropriate style for art as modernism gained ground in Europe. *Fin de siècle* art movements were brushed aside by modernism; optimism based on eternal values was destroyed as mechanization took command. The conserving arts gave way to the explosive forward movement of the avant-garde. Pictorialism could not stand the blast of modernism in the guise of Cubism, Futurism, abstraction, Neo-classicism, New Realism, and Surrealism.

Despite its elitist claims as an art form, the pictorialists' grasp of contemporary art trends was always tenuous, even before 1910. Pictorialism was never avant-garde when compared with current movements in Fine Art. It was always behind the times. When it seemed to be getting abreast of the times, as in Alvin Langdon Coburn's Futurist-inspired "Vortographs," exhibited in London in 1917, or in Paul Strand's Cubist-inspired work published in the last issue of Stieglitz's *Camera Work* in 1917, it was vilified by most pictorialists. Coburn retired from photography and *Camera Work* folded—though Steiglitz and Strand went on to make enormous contributions to art photography *outside* pictorialism. The reputations of these men have remained high not so much for their contribution to pictorialism, considerable as that was (especially from Stieglitz and Coburn), but because of their dedication to the elitist, exclusive nature of art photography. As soon as pictorialism became common fare, a way of making pictures that any enthusiast could enjoy, it was of no interest to the elitists. Once it had failed to keep its distance from the mass of amateurs, pictorialism could no longer fulfill its ambition to be art, because art by definition was made by and for the few, and not by or for the multitude.

JOHN TAYLOR

See also: Stieglitz, Alfred; Demachy, (Léon) Robert; and Brotherhood of the Linked Ring.

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PIGOU, WILLIAM HENRY (1817–1858)

English photographer

Dr. William Henry Pigou took over the task of recording the ancient monuments of the Bombay Presidency from Colonel Thomas Biggs in early 1856 and spent over a year as Government Photographer on the project. Before taking on this assignment, Pigou had been a member of the Bombay Photographic Society (since 1854) and, according to Biggs, had several years experience of photography in India. Some fine landscape images by Pigou also survive.

Using large format paper negatives (up top 16" × 12"), post-waxed, Pigou's work was, with a few publicly criticised exceptions, precise, architecturally accurate, and usually photographed under oblique lighting conditions selected to reveal the intricate sculptured facades which decorated many of these monuments.

His work, together with that of his predecessor and his successor, was eventually published in India in 1866, subsidised by the Committee of Architectural Antiquities in Western India, in Taylor and Henderson's *Architecture in Dharwar and Mysore. Photographed by the late Dr. Pigou, Bombay Medical Service, A. C. B. Neill, Esq. and Colonel Biggs, Late of the Royal Artillery*. These large format portfolios—containing tipped-in albumen prints—were published in London by John Murray. Some of the photographs were later used as the basis for the engravings which illustrated James Fergusson's History of Indian and Eastern Architecture, also published by John Murray, in 1876.

JOHN HANNAVY

PIOT, EUGÈNE (1812–1890)

French photographer and publisher, collector, and art historian

A wealthy amateur, Eugène Piot started practicing daguerreotype in 1840, when he traveled to Spain with his friend Théophile Gautier (both were part of the Romantic community which colonized the Rue du Doyenné, in Paris in 1835). The poet mentioned this photographic venture in his travelogue, *Tras los Montes*, but none of Piot's plates survived. A remarkable art connoisseur and collector (he bequeathed his collections to the Institut de France, the Bibliothèque Nationale, and the Louvre), Piot traveled and photographed in Italy, Greece, and the Near East.

His subjects are chiefly architectural views related to his artistic and archeological interest. He is mostly known for publishing photographic albums a few months before Blanquart-Évrard, to the surprise of the photographic milieu. Familiar with publishing, Piot created, in 1842, an art journal, *Le Cabinet de l'amateur et de l'antiquaire*. In June 1851, he released

the first (and probably unique) installment of *L'Italie monumentale*. Emphasizing on the competition between photography and printmaking, Francis Wey considered that "thus begins the series of art travels books illustrated by photography: Mr. Piot created a new commercial field" (*La Lumière*, August 17, 1851, p. 111). His other publications—none of which he completed—include *L'Acropole d'Athènes* (1852), *Temples grecs* (1854), *Rome et ses environs*, and *L'élite des monuments français*.

Piot exhibited at the Royal Society of Arts in London (1852), at the 1855 Exposition universelle in Paris (First Class Medal), and at the Société française de photographie (1857, 1859).

Pierre-Lin Renié

See also: Blanquart-Evrard, Louis-Désiré; Wey, Francis; and Société française de photographie.

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PIZZIGHELLI, GIUSEPPE (1849–1912)

Giuseppe Pizzighelli (according to his friend and co-researcher Josef Maria Eder) was the son of an Austrian army surgeon of Italian origin, and was educated at the military academy in Vienna.

He is first recorded as a keen amateur photographer in the late 1860s, while a serving lieutenant in the Austrian army, working with his friend and fellow officer Victor Tóth, and wet collodion plates and 'Busch combination lenses for portraits and landscapes' (Eder 1945).

Despite training as a military engineer, in 1878 Pizzighelli was appointed as head of the photographic department of the Austrian army's Technical Military Committee in Vienna, with the rank of captain, and his important published contributions to the development of photography all date from after this appointment.

It was during this posting that Pizzighelli joined with Baron von Hübl in the preparation of platinum prints—following William Willis's instructions. Von Hübl was a fellow captain—later to achieve the rank of Field Marshall—and their work led to the introduction of a significant improvement to the process that Willis had patented in 1873. It was Pizzighelli and von Hübl's work in the later 1870s and early 1880s which improved the reliability and manufacturing consistency of the paper itself, and led to much more widespread use of platinum as the ideal 'permanent' printing medium.

He and von Hübl published their experimental results in early 1882, and their work was awarded a medal by the Vienna Photographic Society—an organization with which he would have a continuing relationship. An abridged version of their account was translated into English and published in the *Journal of the Photographic Society* in the same year.

Their much more comprehensive book *Die Platintype* was also published in 1882. It was also translated into French and published by Gauthier-Villars of Paris in 1883 and, translated into English by J. F. Iselin and edited by William de Wiviles lie Abney, it was published in London by Harrison & Sounds in 1886.

The platinotype enjoyed considerable popularity within the expanding community of art photographers in the closing years of the ninettenth and early years of the twentieth centuries—notable inclusions being Frederick H Evans, Paul Martin, Alfred Steiglitz, Paul Strand, and Clarence White.

While several published sources make much of the claim that Pizzighelli and von Hübl gave their process 'freely to the world,' an 1887 patent exists in Pizzighelli's name which suggests the contrary. By that time he had been posted to Bosnia as an engineering officer, and was working alone. That 1887 patent refers to a modified version of the platinotype—a printing-out paper using sodium ferric oxalate and potassium chloroplatinate which did not require further development. It was briefly marketed as the Pizzitype, but ironically—bearing in mind that he and von Hübl had improved the consistency of the developed platinum print—it was, allegedly, inconsistency in manufacture which led to the material being withdrawn from sale.

Pizzighelli and Eder are credited with the production of the first chemically developed gelatin silver chloride emulsions in 1881—both prints and glass diapositives—twelve years before Leo Hendrik Baekeland's introduction of Velox 'gaslight' paper. They had started their collaboration in 1880 and reported their work to the Vienna Academy of Sciences in January 1881, publishing their results in a lengthy-titled pamphlet in the same year—*Die Photographie mit Chlorsilbergelatine und chemischer Entwicklung nebst einer praktischen Anleitung zur raschen Herstellung von Diapositiven, Stereoskopbildern, Fensterbildern, Duplikat-Negativen, Vergrösserungen; Kopien auf Papier …* Eder went on to produce the first gelatin silver chloro-bromide emulsions himself. When later writers asserted that others had prior claim for the production of the first developed silver chloride emulsions, the 75-year old Eder asserted his

and Pizzighelli's claims to their invention in the *Journal of the Photographic Society* in 1930.

To demonstrate the fineness of the grain structure of their silver chloride plates, Eder and Pizzighelli made reduced size positives from existing collodion negatives by their friend Victor Angerer, the well-known Viennese portrait photographer. These were exhibited at the twentieth anniversary exhibition of the Vienna Photographic Society in 1881. What caused especial interest amongst those seeing these images for the first time was the hitherto unavailable range of print colours which the two pioneers had produced by using a range of different developers. In Edward Epstean's translation of Eder (1945) the colours are described:

> The warmest bright red shades were developed with hydroquinone and ammonium carbonate, the brownish tones with ammonium ferro-citrate, the greenish brown tones with alkaline gallic acid solution, and so forth… This diapositive exhibit was awarded the gold-enamel medal by the Vienna Photographic Society.

Pizzighellis and Eder's work was further developed by Dr. Ernst Just in 1882, and by Leon Warnerke in 1889.

In his role as head of the army photographic department, Pizzighelli was clearly an influential figure. It was to him that Adolphe Steinheil brought his newly computed aplanatic lens set for testing in 1881. The aplanat design had been something with which Steinheil had been working since the late 1860s, producing lenses which were virtually free of both chromatic and spherical aberrations, and which offered a very flat field—characteristics which were essential for much of the work in which Pizzighelli's unit was engaged.

Amongst many texts, Pizzighelli wrote two manuals on photography—*Anleitung zur Photographie für Anfänger* published in 1890, and *Handbuch der Photographie. Für Amateure und Touristen,* published in 1892.

After a lengthy military career—achieving the rank of colonel—he retired to Florence in 1895, where he began an enduring relationship with the Società Fotografica Italiana, eventually become a director and later president. He died in Florence in 1912, at the age of 63.

John Hannavy

See also: Huebl, Baron Arthur Freiherr von; Evans, Frederick H.; Willis, William; and Eder, Joseph Maria.

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PLATEAU, JOSEPH ANTOINE FERDINAND (1801–1883)

Belgian physicist, inventor of the phenakistiscope

Joseph Plateau was born in Brussels, Belgium, in 1801. He became an orphan at fourteen. A pupil at the Atheneum, Brussels 1817–22, he was much influenced by his teacher Adolphe Quetelet. Quetelet would later found the periodical 'Correspondence mathematique et physique,' in which Plateau's technical papers were published. Plateau enroled in the Philosophy Faculty of the University of Liège in 1822. In 1823–24 he obtained diplomas in art and law. Fascinated by chemistry, Plateau carried out his own experiments and in 1824 obtained the Diploma in Physical and Mathematical Sciences. He became a mathematics teacher in 1827, and had soon published a paper on optical perception, and designed instruments for perception experiments. His 1829 doctoral thesis, 'Dissertation on Several Properties of Impressions Produced by Light on the Organ of Sight,' includes observations on colour theory, and also anorthoscopic (distorted) drawings which appear normal when viewed through a spinning, slotted disc. The anorthoscope was marketed in 1836.

In 1830 Plateau moved to Brussels, teaching physics 1833–34. By late 1832 he had invented the phenakistiscope, or phénakisticope [original spelling]—from *phenax* -"deceptive" and *skopeo*, "I look at." An almost identical device, the stroboscope, was invented simultaneously by Austrian physicist Prof. Simon Stampfer. Plateau's instrument comprised a disc with a small central hole, mounted on a handle so that it could spin freely. Each disc had small equidistant radial apertures around the circumference and pictures on one side. The disc was spun with the pictures facing a mirror, and the moving images viewed through the slots, by reflection. Other versions of the device comprised two discs on the same shaft, one with slots and the other containing a sequence of images. When the two discs rotated, an animated picture was seen by viewing the picture disc through the slots in the shutter disc. Most of the animation sequences were drawn in a cycle, a continuous flow with no beginning or end. Plateau's first subject was a line drawing of a pirouetting dancer, in sixteen positions.

Versions with a variety of names, including Phantasmascope and Fantascope, were sold commercially as a philosophical toy by various publishers in France and England, with discs featuring a wide range of imaginative animated drawings, including abstract designs of coloured balls. Plateau himself received no financial reward for his invention.

Within a few years Plateau had produced an improved version, with backlit pictures on translucent varnished paper, designed and geared in such a way that the optical

distortions apparent in the original model were reduced. The subjects were fantastic characters designed by the Belgian artist Jean-Baptiste Madou, extrapolated into motion sequences by Plateau himself. The result could now be viewed more comfortably with both eyes, and by more than one spectator.

Plateau moved to Ghent in 1835, and became a professor at the University. Plateau's experiments relating to visual perception were wide-ranging, and included the persistence of luminous impressions on the retina, accidental colours, the contrast of colours, and coloured shadows. He observed and commented on many aspects, including 'irradiation'—the phenomenon of a bright object seen against a dark background appearing larger than it actually is, related to the recurrent mystery of the apparent size of the moon being larger on the horizon than when it is high in the sky. He devised an instrument to study the effect, which is measurable, and his results were published in 1839. When he was around forty-two years old, Plateau gradually went blind as a result of an inflammation of the eyes. (This was probably not, as is often suggested, caused by experiments involving direct viewing of the sun). Undaunted, he continued to experiment assisted by his colleagues, friends and family, including his elder son Félix. For decades Plateau continued his studies of visual persistence, especially the varying persistence of different colours. He believed that this effect was a property of the retina, but it is now known to be linked to the brain.

As well as undertaking optical research, Plateau also studied the phenomena of capillarity and surface tension of liquids, and his important work in that field is still well known. Many experiments describe the structure of soap films, illustrating the mathematical problem of the existence of a minimal surface with a given boundary—now named Plateau's Rules. Stereoscopic photographs of Plateau-type laminar soap films formed on wire shapes, taken about 1880, are in the J. Plateau collection, Ghent.

Plateau's phenakistiscope viewer evolved into the zoetrope drum-form moving picture device, and was the spur for many later experiments. In 1843 the obscure English experimenter T.W. Naylor suggested a machine for projecting phenakistiscope-disc drawings, and a plan of the device was published.

Several of Plateau's correspondents and contemporaries soon suggested viewing devices for a more ambitious idea; the presentation of moving photographs. Inventor of the stereoscope Charles Wheatstone, daguerreotypist Antoine Claudet and others struggled with the problem over many years. In 1852 the French optician Jules Duboscq combined Plateau's phenakistiscope with Wheatstone's stereoscope to produce the Bioscope, a direct viewing instrument for producing a stereosopic photographic moving image. (The name would later be used for motion picture film machines). In 1879 Eadweard Muybridge devised his successful Zoogyroscope or Zoopraxiscope projector developed from Plateau's phenakistiscope principle, with glass discs bearing painted figures based on his famous American sequence photographs. Joseph Plateau died in 1883. His colour vision research was an important contribution to the subject, and his principle of producing moving images by rapid succession of a number of progressive poses would later be a key feature of the invention of motion pictures on film.

STEPHEN HERBERT

Biography

Born in Brussels on October 14, 1801. His father was Antoine Plateau (1759–1815), his mother Catherine Thirion (1771–1814). After his father's early death, an uncle supported and encouraged Plateau's early studies. Plateau married Fanny Clavareau, August 27, 1840. He was a member of the Royal Academy of Belgium, a correspondent of the Institute of France, and a member of many European academies and learned societies. Joseph Plateau died in Ghent on September 15, 1883, forty years after he lost his sight. No photographic portrait was known until the 1990s when an evocative daguerreotype, taken by photographer Pilizzaro in 1843 just before Plateau went blind, was discovered in France. It was acquired by the Museum of the History of Science, University of Ghent, and is now in their permanent collection.

See also: Duboscq, Louis Jules; Wheatstone, Charles; and Claudet, Antoine-François-Jean.

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PLATINOTYPE COMPANY

In 1879, William Willis junior founded the Platinotype Company in order chiefly to manufacture and market his platinum printing papers. Five years of research in his private laboratory at Bromley, Kent, had followed his initial patent of 1873—Improvements in Photochemical Printing—before Willis advanced sufficiently to offer his invention, described in his patent of 1878, to the public. A factory was established at 66 Beckenham Road, Penge, and the Company's sales office at 29 Southampton Row, High Holborn, London, which later

transferred to 22 Bloomsbury Street.

By 1880 the first commercial platinotype papers were on sale, with a choice of rough or smooth surface, on medium or thick paper, at a price of 1/- (one shilling = 12 'old' pence = 5 'decimal' pence) for a sheet 17.75 x 22.75 inches; other sizes could be supplied pro rata at a unit cost of ca. 4 d/sq.ft ('old' pence per square foot). By 1892, the Company was selling platinotype papers in nine sizes, pre-cut to match the negative formats then current, at a unit cost of ca. 8 d/sq.ft, which remained constant over the next 15 years, and may be compared with the cost of ca. 3 d/sq.ft for printing-out papers, and 6 d/sq.ft for the new bromide enlarging papers. For storage, perfect dryness was of paramount importance, otherwise the sensitizer became fogged by the action of moisture; accordingly, the Company supplied the paper sealed in soldered tins, and recommended storing it in special tubes containing a desiccant of anhydrous calcium chloride. Sensitized textiles could also be supplied for 1/- to 1/6 per square foot: nainsook—a very fine muslin; sateen—for d'oyleys, mats, and lampshades; and rough oatmeal cloth—for screens, antimacassars, cosies, and mantle-cloths.

Because the process was protected by Willis's later patents of 1878 and 1880, prospective users, both amateur and professional, were initially obliged to pay the Company 5/- for a licence to practise platinum printing. This requirement was suspended in 1888 when Willis launched his new cold bath process, described in two more patents, of 1887, in which the development bath contained all the platinum salt. It proved short-lived, however, owing to an uneconomic defect: platinum metal tended to precipitate from the stored developer. Willis withdrew this platinum in the bath process in 1892, upon introducing his final, most successful modification, cold development paper, which he protected by secrecy rather than patent.

In 1885 the Platinotype Company was awarded the gold medal of the International Inventions Exhibition. By the 1890s, Willis's range of papers offered every combination of texture, weight, more or less contrast, and black or sepia image—numbering about 20 varieties. These sensitized papers were of two main types: one could only be developed hot, the other was also suited to development at room temperature. The image colour varied slightly, from bluish-black in cold development (ca. 20 °C), especially using the Company's proprietary D Salts as developer, to brownish-black at high temperature (ca. 75 °C). Most workers preferred cold development to avoid scalding their fingers. Willis also devised Sepia platinotype papers, which incorporated a mercury(II) salt in the sensitizer. These called for hot development; but to obtain a sepia colour with the ordinary papers, some workers added mercuric chloride to their cold development baths.

The company's platinotype papers were coded by a single letter to designate hot bath papers, a doubled letter for cold development papers, and 'S' to indicate sepia papers. Willis later added a parchmentized paper having a semi-glossy surface—Japine paper. The surfaces, weights, and image colours available were as follows:

A, AA Smooth surface, medium weight
B, BB Smooth surface, heavy weight
C, CC Rough surface, very heavy weight,
K, KK, KS Smooth surface, heavy weight, higher contrast
S Smooth surface, medium weight, sepia colour, hot bath process
RS Rough surface, very heavy weight, sepia colour, hot bath process
T, TT, TS Rough surface, heavy weight, higher contrast
Y, YY, YS Smooth surface, very heavy weight
Z, ZZ, ZS Slightly rough surface, very heavy weight

Willis purchased the platinum salt, potassium chloroplatinite, from the leading precious-metal refiners, Johnson Matthey, whose company records for the sales of this salt make possible a rough calculation that the production of platinotype paper was usually in excess of one million square feet per year.

Other goods marketed by the Platinotype Company included chemicals, porcelain dishes, printing frames, and calcium chloride tubes. A director of the company, Herbert Bowyer Berkeley (1851–1891), was responsible for one of the most significant improvements to photographic processing by discovering that developers for silver emulsions could be stabilized by the inclusion of sulphite, which enabled the development of negatives to greater density ranges without fogging. The company marketed this important innovation in 1882 as the very first proprietary developer, "Sulpho-pyrogallol." The works manager of the company's factory in Penge, WH Smith, also collaborated with Willis to produce a hand-portable 'Key camera,' patented on 28 March 1889, which incorporated a novel method of changing the glass plates.

The chief competitor to Willis's platinotype was Pizzighelli's printing-out platinum paper, invented in 1887, which was manufactured by Hezekiel and Jacoby in Berlin, Dr Just in Vienna, and Unger and Hoffmann in Dresden. Such paper was also made in England by Berger and Company, and by Hardcastle; but the major photographic companies, Ilford and Kodak, did not enter the platinum paper market until the early 20th century. To retail the Platinotype Company's products in the United States, the sister-company of Willis and Clements was founded ca. 1885, with offices at 25 North Seventh Street, Philadelphia, later moving to 1624 Chestnut Street. Rival suppliers in the United

States included JC Millen of Denver, Colorado, E and HT Anthony of New York, and the American Aristotype Company of Jamestown.

As a consequence of the "platinum famine" brought on by the Russian Revolution and the Great War, the Platinotype Company had to diversify its products, introducing as substitutes "Satista" paper in 1913, and "Palladiotype" paper in 1917. On the death of William Willis in 1923, the Company passed to his younger brother, John, and was subsequently headed by a cousin, Alfred Willis Clemens, until 1937, when the Company was voluntarily dissolved.

MIKE WARE

See also: Platinum Print; Willis, William; and Bromide Print.

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PLATINUM PRINT

From the earliest days of photography, the noble metal platinum was recognised as a potential image substance. Both Sir John Herschel in 1839, and Robert Hunt in the 1840s, sought to employ platinic salts photochemically, but found no real success. Printing in platinum did not show any promise until 1873 when, in search of a greater permanence than silver afforded, William Willis junior, of Bromley, Kent, turned to experimenting with the little-known platinous—as opposed to platinic—salts. Progress did not prove easy, however: to achieve satisfactory quality, Willis had to include salts of silver, lead, and even gold in his sensitizers. Such uncertain mixtures won little attention for his processes at first. In the struggle to fulfil his original concept, Willis's endeavours spanned twenty years of research, producing five British patents. By 1878 he had succeeded in eliminating the silver from his sensitizer, which emboldened him to found the Platinotype Company to market his platinotype paper, but its processing called for a scaldingly-hot, poisonous, developing bath, which had little appeal.

By the mid-1880s Willis was facing competition from Giuseppe Pizzighelli and Baron Arthur von Hübl in Austria, who devised a printing-out platinum paper in 1887. The photographic press praised Willis's paper in 1888, but it was not until 1892 that he finally perfected the process with his "cold development" paper, which was instantly acclaimed, ensuring that his product enjoyed much wider use. By the close of the century, more platinotypes could be seen on the salon walls than any other print medium: the process had achieved pre-eminence.

Platinotype is a later addition to the group of iron-based photographic printing processes, whose principles were discovered by Sir John Herschel in 1842, using ammonium ferric citrate. Platinotype differs in requiring ferric oxalate, which is decomposed by light to insoluble ferrous oxalate, as first noted by Johann Wolfgang Döbereiner in 1831. At this stage, the image is faintly visible, partially printed-out in pale buff on a yellow ground. It further requires development in a bath of hot (80 ˚C), strong (30 per cent) potassium oxalate solution to solubilise the ferrous oxalate, which can then reduce the platinous salt, included as potassium chloroplatinite, to platinum metal in a finely-divided state known as "platinum black." These two reactions may be represented by the following chemical equations:

ILLUSTRATION

UV light + $Fe_2(C_2O_4)_3$ —> $2FeC_2O_4 + 2CO_2$

UV light + ferric oxalate —> ferrous oxalate + carbon dioxide

$2FeC_2O_4 + 4K_2C_2O_4 + K_2PtCl_4$ —> $2K_3Fe(C_2O_4)_3 + 4KCl + Pt$

ferrous + potassium + potassium —> potassium + potassium + platinum

oxalate oxalate chloroplatinite ferrioxalate chloride metal

To clear the print, all the residual chemicals are removed by three successive baths of very dilute hydrochloric

acid, followed by washing in water, to leave an image of pure platinum black embedded in the surface fibres of the paper sheet.

The problem with this elegant process is that the reduction of the platinous salt is slow, and may be further inhibited by additives in the paper, such as gelatin size. Unless the reaction is speeded up by using hot developer, the chemicals tend to wash out of the paper before the image is fully developed. How Willis's "cold development" paper overcame this problem was never disclosed, but it appears to employ an alum-rosin paper size in preference to gelatin. The maintenance of a dry storage environment for unexposed paper was vital to avoid degradation by moisture. In contrast, the presence of some moisture was essential to facilitate the chemistry of the printing-out platinotype process of Pizzighelli and Hübl; but this was hard to control, so attempts to market commercial papers of this type foundered rather quickly.

Platinotype claimed a threefold advantage over all other photographic printing processes: it was said to be "permanent, artistic, and simple." Acknowledged as the easiest process, it was three times faster than silver printing-out paper. Of its permanence there could be no doubt, because platinum is the most inert of metals, impervious to attack by any common substance. What was not recognised in the 19th century, is that platinum black is also a very efficient chemical catalyst and, when exposed to the—usually polluted—Victorian atmosphere, it promoted the formation of strong acids within the paper fibres. Thus the paper of a platinum print may be embrittled by acidic degradation over the years, albeit the image remains pristine: historic platinotypes should therefore be handled carefully, to avoid damage.

Concerning the aesthetics of the process there was at first some equivocation: the dominant photographic print medium from 1855–1895, was the albumen print, providing the familiar brown silver image in a glossy layer of hardened egg white. For photographers habituated to this medium, the neutral grey-black platinum print with its luminous tonal gradation and totally matte surface came as a shock. Some connoisseurs greatly preferred it, however, dismissing albumen as "sharp and slimy." To accommodate all tastes, Willis introduced both "Sepia" and "Japine" platinotype papers into his commercial range. Platinum printing was much used for portraiture, landscape, and important documentary work. Like albumen, it could only be contact-printed. Platinotype paper cost about twice as much as silver printing-out paper, but it was comparable in price with the new (1890s) bromide enlarging papers.

Platinotype was the favoured medium of the Brotherhood of the Linked Ring; notable users included Frederick H. Evans, whose great series of cathedral interior studies was begun in 1890, Henry Peach Robinson, whose most important exhibition work was printed entirely in platinum, as was the portraiture of Frederick Hollyer, the atmospheric landscapes of Alfred Horsley Hinton, and George Davison, the genre studies of Frank Meadow Sutcliffe, and, from outside the fraternity, Peter Henry Emerson with his handsome volume of 40 platinotypes, *Life and Landscape on the Norfolk Broads*, printed in limited edition by James Valentine of Dundee.

By 1900, the platinum print had reached its zenith, widely acknowledged as the finest printing medium in the photographic repertoire; but its glory would prove short-lived: the First World War would transmute platinum into a strategic material, requisitioned for making explosives, rather than pictures. Photography's most beautiful and permanent of all processes enjoyed a commercial lifespan of only 30 years, but happily the tradition of the hand-crafted platinum print continues even today.

MIKE WARE

See also: Platinotype Co. (Willis & Clements); Evans, Frederick H.; Robinson, Henry Peach; and Brotherhood of the Linked Ring.

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PLUMBE JR., JOHN (1809–1857)

"After having devoted nearly all our time, for upwards of three years, upon the U.S. transcontinental railroad—exhausting all our pecuniary means—we at last, after being laughed at as a madman, were obliged to resort to taking

daguerreotype likenesses, in order to keep up the soul of our undertaking, by supporting our body." John Plumbe, Jr., *The Plumbeian*, January 6, 1847.

John Plumbe Jr., a man of extraordinary ability and vision, was the pre-eminent promoter of photography in America during the 19th century and the first effective advocate for a United States transcontinental railroad. Plumbe was born at Castle Caereinion, Welshpool, North Wales, on July 13, 1809. His family was English and when John was twelve they immigrated to the United States. Trained as a civil engineer, he was quick to comprehend the importance of railroads to national development and passionately presented his idea for a Pacific railroad to Congress in 1838, a decade before others seriously considered the matter.

Plumbe first became aware of the wondrous daguerreotype process while in Boston during the Spring of 1840 where he probably received instruction from Daguerre's agent, François Gouraud. Turning to photography to finance his railroad ambitions, Plumbe helped to shape a developing industry. With unbounded optimism and tireless vigor Plumbe immersed himself in the new art and science to become America's first nationally known photographer. He attained this distinction by winning the highest honors in photographic competitions at scientific and industrial fairs. Plumbe was the first to introduce a franchised photographic business, establishing within six years a chain of twenty-six galleries in the United States with outlets in Paris and Liverpool, most of which were accessible by railroads. He advertised his business extensively in the leading American newspapers and furthered his reputation through brand name recognition, requiring all photographs from his numerous galleries to prominently bear the Plumbe name.

Beginning in Boston in 1840, Plumbe established the United States Photographic Institute and opened branch galleries or "photographic depots" as the railroad advocate called them. In addition to taking photographic portraits, Plumbe manufactured and imported cameras and offered complete daguerreotype outfits. He taught the first generation of American photographers including Gabriel Harrison, William Shew, and Samuel Masury. Plumbe's 1841 daguerreotype manual is the earliest published American photographic work. Pursuing an interest in color photography, Plumbe purchased from Daniel Davis Jr. in 1842 the rights to a patented process to apply color to daguerreotypes by selective electroplating and he promoted this feature extensively.

By 1843 Plumbe relocated the center of his photographic operations to New York City where many noted celebrities of the day frequented his fashionable Broadway establishment. Plumbe's New York gallery was filled with the likenesses of famous authors, artists, musicians, and entertainers, among them Washington Irving, Edgar Allan Poe, John James Audubon, and Tom Thumb. Many of these fine daguerreotype portraits were reproduced as lithographs by print maker Nathaniel Currier.

Plumbe opened a daguerreian gallery in Washington, D.C., late in 1844 where he photographed the leading statesmen of the day. On several occasions Plumbe received invitations to the White House from President James K. Polk and secured the first photographs showing the interior of the Executive Mansion, including the earliest portrait of a United States President with his Cabinet. In the Spring of 1846, Plumbe produced a series of architectural daguerreotypes of Washington, D.C., depicting the United States Capitol, the White House, the Patent Office and Post Office. These images, the earliest photographic records of Washington, D.C., are now preserved at the Library of Congress.

Toward the end of 1846 Plumbe established the National Publishing Company in Philadelphia and issued a series of decorative sheet music, "The Plumbe Popular Magazine," and a portfolio of thirty-four lithographs entitled "The National Plumbeotype Gallery." All of these works were illustrated with "Plumbeotypes," namely lithographs made from zinc plates transferred from Plumbe daguerreotypes. "The National Plumbeotype Gallery" is of particular importance as it represents the first collective collaboration of photography and print making for portraiture. However, the public did not favor Plumbe's ambitious publishing efforts and by mid-1847 he was forced to suspend all production and refocus his attention to the photographic business and his transcontinental railroad advocacy. John Plumbe suffered severe financial reverses during 1847–1848 due in part to the mismanagement of his vast enterprise and the significant increase of competition in the photographic field. By 1849 all of his fine establishments had either been sold to meet the obligations to his creditors, or had been transferred into the hands of his operators.

During the Gold Rush of 1849, Plumbe journeyed to California to determine first hand the feasibility of a Pacific railroad. Encouraged by his survey Plumbe continued to write, lecture and memorialize Congress for the construction of the transcontinental railroad. He returned to his family's home in Dubuque, Iowa, in 1854 where he opened a U.S. patent agency and a steam milling operation.

Suffering from physical and mental illness John Plumbe Jr. ended his eventful life on May 28, 1857. In 1976 a group of historians erected a monument at Plumbe's grave site extolling his contributions to photography; his genius for promoting photography in America was second only to that of George Eastman.

Clifford Krainik

Biography

Born in Welshpool, Wales, July 13, 1809, he immigrated to America age twelve and studied civil engineering. He advocated construction of U.S. transcontinental railroad in 1838. Plumbe turned to photography in 1840 to finance railroad advocacy and established twenty-six galleries in major U.S. cities between 1840 and1846. He manufactured and imported daguerreotype supplies in Boston and New York City. Plumbe was awarded medals at institute competitions in Boston, Philadelphia, and New York. He purchased patent rights for color daguerreotypes in 1842. Plumbe promoted brand name recognition and advertised extensively. He secialized in celebrity portraits in Washington, D.C., and New York galleries and established the National Publishing Company in Philadelphia in 1846.

Inventor of the plumbeotype process (lithographs from daguerreotypes), he took the earliest photographs of the U.S. Capitol and the White House in 1846. He suspended his photographic business, 1847–1849, and moved to California (1849–1853) where he continued to advocate for the transcontinental railroad. Plumbe committed suicide at Dubuque, Iowa, May 28, 1857. A monument was erected to Plumbe at the Linwood Cemetery in Dubuque in May of 1976. The first retrospective exhibition of his work was held at the Historical Society of Washington, D.C., 1997.

See also: Daguerreotype; and Eastman, George.

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PLÜSCHOW, PETER WEIERMAIR WILHELM (1852–1930)

Italian photographer

Born Mecklenburg, Germany 1852. By the 1870s Wilhelm Plüschow had a photographic studio in Naples trading in studio portraits and occasional journalism. First cousin to Baron Wilhelm von Gloeden whom he assisted in turning his interest in photography into a business in Taormina, Sicily in 1888. By now both were photographing the male nude. Influenced by Gloeden's style, by the time Plüschow moved to Rome as 'Guglielmo Plüschow,' he was producing male and female nudes which gained a reputation throughout Europe and America for overt homoerotica. Much praised by the author John Addington Symonds who lived in Rome, Plüschow, along with his Sicilian assistant, Vicenzo Galdi (1856–1931), often avoided the more romantic trappings of Gloeden's classical props, in favour of realism, with an emphasis on the sexual promise of male peasant youth. Forerunners of Pier Paolo Pasolini (1922–1975) and his love of *ragazzi*, Plüschow and Galdi's overt depictions of potent male sexuality, many said pornography, landed both of them in trouble and Plüschow was forced to return to Berlin and obscurity in 1910. Even now, while Gloeden can still be read as the poetic homeric dream. Plüschow, with his once only photographed models in highly suggestive poses, still challenges and he rarely enters the directories. However he can be regarded as a pioneer of contemporary gay culture, perhaps in time more relevant than Gloeden.

ALISTAIR CRAWFORD

POITEVIN, ALPHONSE LOUIS (1819–1882)

French chemist and printmaker

Poitevin was born in 1819 in France. He contributed to several fields of photography. He took up the study of photography while still a student in the Ecole Centrale, almost immediately after Daguerre's process was published in 1839. He recognized the one great defect of this method is that it gives but a single photograph. He tried to solve that problem by trying to make molds by electrically depositing copper upon the silver plate carrying the daguerrean image. During this work he discovered a method of photo-chemical engraving upon plates coated with silver or gold. This discovery turned out, however, to be of no practical importance. In 1847 when working at the Eastern Salt Works he continued his work on trying to make copies of daguerreotypes on silvered copper. The details of these methods were published in two papers in *Comptes Rendus Hebdomadaires*

des Séances de l'Académie des Sciences (vols. 25 and 27, 1848), as well as in his book. In this case copper was deposited on the lights, fixed and covered with a solution of gelatin, which was allowed to set and dry slowly. Then it was stripped, carrying the copper deposit with it. In this way he was able to transform daguerreotype images into negatives from which prints could be made on silvered papers. Experience from this early work led him to his most important discovery, the photographic engraving technique, which happened in 1854.

Poitevin is recognized for establishing the basic principles of *photo-lithography*, *carbon printing* and *collotype printing*. In August 1855 he patented a helioplastic process, by which films of dichromated gelatin were exposed to light under a negative and then soaked in water, which resulted in a relief image from which a mold could be made. Mungo Ponton in Scotland had discovered in 1839 the effect of light on dichromates and William Henry Fox Talbot had in 1853 discovered that dichromated gelatin which had been exposed to light would allow greasy ink to adhere to it, although it repelled water. Based upon these facts Poitevin invented his new photo-lithographic processes: carbon printing and collotype printing. A negative was printed onto a tissue of pigmented gelatin and potassium dichromate that, when washed and transferred to a second sheet, produced a durable, rich shiny print. Carbon prints are noted for their permanence and their rich and glossy dark tones. The carbon print process reached the height of its popularity between 1870 and 1910.

His work in heliochromy started in 1865 with some experiments on the possibility of recording colors on paper coated with silver chloride, similar to the earlier work by Herschel and Becquerel. First it was necessary to obtain violet sub-chloride of silver before recording the images. To sensitize the paper for exposure he dipped the paper in a solution of potassium dichromate and copper sulfate and let it dry. When such a paper was exposed to light beneath a transparent colored picture, such as a painting on glass, the colors of the picture reproduced on the paper. The main problem with heliochromy of this type was how to fix the images. As a fixing solution, Poitevin used water with sulfuric acid and after that glazed the pictures with albumen, but permanent images proved impossible to retain. Specimens of the process were exhibited at the 1867 Paris exhibition.

In 1879 he described an iron printing process which was his last publication in the field of printing processes based on photographic techniques.

HANS I. BJELKHAGEN

Biography

Alphonse Louis Poitevin was born at Conflans, Sarthe, France, in 1819, and educated at St. Calais. In 1839 he went to Paris and entered Ecole Centrale des Arts and Métiers, leaving it in 1843 with a Civil Engineer Diploma. After the publication of the daguerreotype process in 1839, Poitevin took up the study of photography while still a student at Ecole Centrale. After his Diploma he was appointed engineer at Eastern Salt Works which he resigned from in 1855 to move to Paris to work on his printing process and to start a printing company. However, he was not that successful in business and he sold his patent rights to Lemercier, a well-know French lithographer. At this time Poitevin became a manager at Pereire's Chemical Factory in Lyon. From Pereire's factory he went to the glassworks at Ahun-les-Mines and then to those of Falembray. Later he spent some time in Africa at the mines Kefun Thebul. In 1869 he returned to France where he started to work at an alum factory in St. Germain Lambron.

Poitevin was awarded several medals and prizes, e.g., a silver medal by the Société d'Encouragement des Arts for his photo-chemical engraving method. For the discovery of the permanent photographic printing process he was awarded the Duc de Luyne's Prize of 20,000 francs and the Marquis of Argentil's Prize of 12,000 francs as well as the order of Chevalier of the Légion d'Honneur. Poitevin died at Conflans on March 4, 1882.

See also: Talbot, William Henry Fox Talbot; Herschel, Sir John Frederick William; and Becquerel, Edmond Alexandre.

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POLAND

Poland of the 19th century was divided up amongst three neighbouring countries: Russia had the Kingdom of Poland and Warsaw (i.e., the central area), the Austrian-Hungarian Empire had Galicia, Lwów and Cracow (i.e., the southern and eastern area) and the Prussian Kingdom had the Poznan part (the western area). After 1945 up to the present time, the Schlesien, Pommern and Ost-Preussen territories became part of Poland, however they were an integral part of Prussia during the 19th century. As in western Europe, the development of photography there depended on the demands of a society that was not as affluent as that of western Europe. It also depended on new technological methods being used in France and Germany. Initially, photographers used to travel to

Paris, London or Berlin to learn the trade, nevertheless after 1851 they travelled in order to study the collodion process. Unfortunately, most towns do not have any documentary archives, nor information on the number of photographic concerns nor how long they lasted.

Warsaw. From January 1839, frequent articles appeared on the subject of daguerrotype photographs; by October of the same year daguerrotype photographs sent over from Paris and Berlin as well as the work of the physicist, A. Radwański, were being exhibited. In November, a French revue was sold that included an article by M. Strasz discussing the daguerrotype process and A. Giroux's camera that had been brought over from Paris was sold for 1000 roubles. The bibliophile, S. Mielżyński, translated the revue in Paris and then sent it on to Posen, where it appeared in the press prior to November 13. In January 1840, a new translation was sold in Warsaw. The following people used daguerrotype photographs to enhance their work: the artists: M. Zaleski (1839–42) and A. Wysocki (1841–42); the astronomer: A. Prażmowski (1839) and the lithographer: M. Scholtz (1840–41), who from 1842 earned money on his daguerrotype photographs From 1842, itinerant daguerrotypists from Berlin and Vienna came to Warsaw. The most famous establishments were as follows: K. Beyer (1845–77) who produced scenes of Polish towns, catalogues exhibiting ancient and historical monuments and thousands of portraits; K. Brandl (1857–98) the creator of nature photographs; J. Mieczkowski (1850–1915) who took part in 9 exhibitions and who was awarded a prize for his portraits.The first photographic firms that were set up in larger towns were in: Częstochowa (1864, M. Arbus); Kalisz (1857, S. Fingeruth); Kielce (approx. 1858, W. Krajewski); Lublin (1857, T.Boretti); Łódź (1862, D. Zoner), E. Stummann from 1874 and B. Wilkoszewski from 1888 took photographs of towns; Piotrków (1865, K. Suplik); Płock (1864, P. Pawłowski); Radom (1860, L. Makarski).

Lwów, the capital of Galicia, discovered daguerrotype photography due to the work of Professor J.Gloisner. People could pay to have their portraits taken at H. Chołoniewski's and J. Pohlman's establishment (1843) as well as at Szarmacki and J.Dobrowolski's photographic firm (1844). E.Trzemeski (1869–post 1914) left the greatest heritage. In 1883 he took 20 photos related to Jan III Sobieski and scenes of Galicia (a gift for the Photographic Society in Paris in 1886) and produced albums of the following towns: Podhorce and Zloczów. In 1890 together with J. Eder he published a zincography. T. Szajnok, active from 1863 until his death in 1894, produced phototype samples which he sent to Paris in 1870, he published albums of the towns of Krasiczyn and Żólkiew in 1868–69 and in March 1891 helped to set up the first association of amateur photographers—the Amateurs Club. After 1861, J. Eder, published a series of photographs of Cracow, Przemyśl, Rzeszów, Rabka and railway train stations. Those that most frequently exhibited their works in western Europe, were: T. E.Bahrynowicz, J. Eder, Z. Goldhammer, N. Lissa and D. Mazur.

Cracow, the ancient capital of Poland, that was just a small provincial town in the 19th century, discovered daguerrotype photography in 1840 via the work of the physicist S.L.Kuczyński, in 1844 via the work of A.Wysocki, and approximately in 1850 the work of J.Schindler. Itinerant photographers were as follows: H. Wilczek (1843), J.W. Weniger (1851) and A. Weidl from Vienna (1854), K. Szczepkowski (1844–47), D. Zoner (1844,1847), I. Marek (1849,1856/57), Birnstein (1856), F. Gantenbein (1858). Most probably, the first permanent establishment was that of S. Żabieński (1845–52), then W. Maliszewski (1848–80), S. Balicer (approx. 1848), I. Mażek (1860–63) and Ignacy Krieger with his son Natan (1860–1926), who after 1870 produced 113 photographs of historical monuments, peasant types and Stachowicz's drawings and sold them in four sizes. The most famous firm was that of W. Rzewuski (1859–96) who focused on wealthy people, town scenes and works of art. A. Szubert from 1867 took photos of the surrounding countryside of Cracow and also concentrated on various works of art; he was awarded many prizes at a number of exhibitions. Manuals began being published in Cracow: A. Karoli (1893), W. Kleinberg (1894) and A. Larisch (approx. 1902).

The Tatra mountains and its inhabitants, a 110 kilometers south of Cracow, were photographed by: A. Szubert (from 1871), W. E.Radzikowski (1891–99) and M. Karłowicz (after 1902). In the spring of 1871, the members of the Association in Berlin organized an excursion to the Tatra mountains, and in 1872 their chairman, H.W. Vogel, took a number of photos there. Photographers tended to limit themselves to portraits in the other towns of Galicia. After 1870 some firms opened up but there were very few of them. There were two famous photographers from Kamieniec Podolski namely J.Kordysz (approx. 1860–71) a member of the French Society of Photographers who exhibited town scenes and peasant types at their exhibition of 1863 and M.Greim, who subsequently bought his firm and continued with his activities. Polish people were a majority in the area where Poznan was the capital. From 1842 various photographers worked there namely: J.T. Willnow from Berlin and Tuch from Hamburg. The first permanent establishment was that of B. Filehne (1844–approx.1880). The family of A. Zeuscher produced the greatest number of photographs of Poznań inhabitants (1857–1915). After the revolution of 1863/64 many emigrant Poles earned a living from photography: C. Mietkiewicz and N. Straszak in Brussels, W.Ostroróg "Walery" in Paris, J. Kordysz in Kiev, J. Migurski in

Odessa, J. Berkowski in the Kingdom, W. Malinowski in Riga. Amateurs: L. Barszczewski in Central Asia, J. Kozłowski in Suez, J. Potocki in Africa, J. Stróżecki, R. Szwoynicki, L. Kraszewski and others in Siberia. There were about 35 in France and approximately 60 photographers in Berlin who had Polish surnames. A large percentage of photographers were of Jewish origin.

Schlesien. This was a very industrialized region with numerous wealthy towns and bourgeoisie that made the most of their photographers. I have a list of approximately 210 daguerrotypists and itinerant photographers prior to 1860 in Schlesien. 19 originated from Berlin and 38 were from Breslau (Wrocław), its capital. Here, amateur photographers, K. Langhans and T. Goldamer, exhibited daguerrotype photographs at the art exhibition of 1840. In 1844, the mechanic, Karl Staritz, took daguerrotype photographs, and from 1846, E.Wehnert earned his living from them. H. Krone was born here and taught the daguerrotype process, he was known for his activities in Dresden. The most prolific, with thousands of architectural photographs were made in the establishment of E.v. Delden (1877–97), a Berlin man. A.Leisner from 1876 covered the surfaces of porcelain dishes with photos from the surroundings of Waldenburg (Wałbrzych).

Pommeren. The area including the Baltic coast line, with two ancient and wealthy ports. Danzig, where monuments were first photographed by C. Damme (1850). In 1858, E. Flottwell sold a series of 8 photographs of the town and 23 photographs in connection with the 300th anniversary of the grammar-school. The following photographers printed their own photographs of monuments: R.Fischer (approx. 1870), A. Gottheil (approx. 1860), R.T. Kuhn (approx. 1894) and H. Ruckwardt (1889). The most famous ones in Stettin were the following: E. Kiewning, L. Klett, A. Pauly.

JACEK STRZAŁKOWSKI

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POLICE PHOTOGRAPHY

The emergence of photography in the nineteenth century coincided with the introduction and professionalization of the police. In 1800 the world's first professional police service was established by Act of Parliament in Glasgow, in response to the failure of the city's old system of employing unpaid constables and hired watchmen to keep law and order over the expanding population. Other industrialised British towns experiencing similar rises in criminality quickly followed suite. In 1829, just a decade before the public announcement of the daguerreotype, the Metropolitan Police Force (The Met) was founded in London. The Met, the first civil police force organized on modern lines, provided the model for other early municipal police forces around the world, including in Gibraltar (1830), Toronto (1834), Boston (1839), and New York City (1845).

Nascent law enforcement agencies soon recognised the value of photography for identifying criminals. From as early as 1841 in France, and over the next decade in other Western Europe countries and the United States, police forces paid professional daguerreotypists operating in the vicinity of their stations, to take portraits of suspects. Ambrotypes mounted in ornamental frames, dating from the late 1850s and 1860s in the collection of Birmingham's West Midlands Police Museum show how closely early police photographs resembled regular commercial studio portraiture. By the 1870s their format and conventions were gradually adapted to police requirements. Offenders were photographed against plain backgrounds, posed frontally—sometimes with a mirror to simultaneously show their profile—and often holding a board on which was written their name and detention number. Attention was directed towards their hands—placed on their chest—which were considered useful for identification purposes. The photograph illustrated a paper record documenting further details including name and aliases, date and place of birth; marital status, occupation and address; vital statistics and distinguishing features; reason for conviction and sentence.

From the mid-1850s, with the technical advances in the positive-negative system of photography and the diffusion of the carte de visite, the practice of creating and disseminating portraits of criminals became more widely used. Photographically-illustrated criminal records were sorted and classified according to offence committed in albums and card indexes. In America these 'rogues' galleries' were often displayed in a grid—on purpose-made boards or racks—in police stations. As the number of records grew, sorting, classifying and, particularly, retrieving an individual's details became increasingly impractical.

In 1856 the journalist and critic Ernest Lacan (1829–79) advocated the wider use of portrait photography by the French police for checking recidivists and escapees. However, his suggestion for the systematic use of the medium to apprehend criminals was not adopted until the 1870s. Following the violent repression of the Paris Commune of 1871, the Parisian police used photographs taken by the Communards of themselves posing proudly and defiantly on their barricades or triumphantly beside the destroyed Vendôme Column, to track down and punish the insurgents. In addition, Eugène Appert (active

1870s) took individual photographs of those incarcerated in Versailles for the police, prefiguring the format and practices adopted by the studio established in the Paris Police Department in 1872—the first official photographic service to be set up in a police station.

In 1888 Alphonse Bertillon (1853–1914), who had begun his career as a record clerk in the Paris Police Department, became Director of its Identification Bureau due to his invention of anthropometry—the first scientific system of criminal identification. The system, named *bertillonage* in his honor, consisted of recording eleven measurements of set parts of the head and body on a card which, accompanied by two photographs and additional physical details such as eye and hair color, established a unique, classifiable and, most importantly, retrievable criminal record. Replacing the unreliable system of eyewitness accounts, in 1882 *bertillonage* had led to a marked increase in the number of arrests of multiple offenders and was subsequently adopted by police departments outside of France, such as New York City (1888), Argentina (1891) and Chicago (1894). Since bertillonage used photographs in the process of identification, in 1888 Bertillon annexed the préfecture's photography studio to his own department and introduced a strictly uniform photographic technique to complement the system's precision. Bertillon stipulated the standardization of lighting conditions, exposure time, distance from the subject, pose and scale of reduction, ensuring that a clear full face and profile portrait—a mug shot—appeared on each identification card. He also created the *portrait parlé*, an identification chart of sectional photographs of facial features, such as ears and noses, mounted side by side to enable comparison and contrast.

Photography also played an important role in the solving of crimes, by identifying and documenting clues as well as people. Although not widely accepted as evidence in a court of law until the end of the nineteenth, forensic photography was used from the late 1850s to discredit forged documents (*Luco et al. v. USA*, 1859), record crime scenes (Lausanne, France, 1867), including traffic accidents (*Blair v. Inhabitants of Pelham, USA*, 1875) and provide evidence of injuries (*Redden v. Gates, USA*, 1879). Bertillon contributed greatly to this field by devising metric photography—the inclusion of a measuring scale in photographs to provide a permanent record of the scale and relationship between objects at a crime scene. He also developed contact methods of photography which he used for reproduction and enlargement of admitted or questioned documents, most famously *le bordereau* in the case of the Dreyfus Affair for which he submitted evidence for the prosecution in 1894. Soon after the turn of the century bertillonage was supplanted by the more reliable system of dactyloscopy or identification by fingerprints. Ironically, this change of method caused a growth in the number of specialized police photographers as it increased the need for records to be made of impressions of finger and handprints found at crime scenes. This practice, of which examples can be found in the Archives Historiques et Musée de la Préfecture de Police, Paris, was initiated by Alphonse Bertillon in the 1880s.

Photographs of criminals were also adopted outside the judicial system. In the 1860s c*artes de visite* of notorious villains were sold to the public, satiating popular fascination with deviancy and abnormality and prefiguring the celebrity status accorded to gangsters in 1930s America. In the 1870s police photographs were subjected to statistical analysis in order to identify a criminal 'type.' These investigations were underpinned by the pseudo-sciences of physiognomy and phrenology, a belief in the correlation between an individual's internal character traits and their facial features or shape of head. Italian criminologist Cesare Lombroso (1835–1909) assembled a collection of photographic portraits of murderers in the hope of discovering clinical signs of disposition to criminality. Meanwhile in Britain, influenced by the evolutionary theories of his cousin Charles Darwin, British biostatistician and eugenicist, Francis Galton (1822–1911) devised a new system of physiognomic record to show the features common to violent criminals, felons and sexual offenders. Galton created 'composite portraits' by re-photographing pictures of prisoners on the same plate by successive multiple exposures to create a photographic 'mean.' Although the notion of the 'born criminal,' who can be recognized by certain physical traits, such as a low forehead, 'jug ears' and large jaw, is now considered incorrect, it continues to influence representations of criminals in popular culture.

Anne-Marie Eze

See also: Anthropology; Appert, Eugène; Bertillon, Alphonse; Brady, Mathew B.; Crime, Forensic, and Police Photography; Duchenne, Guillaume-Benjamin-Amant de Boulogne; Ethnography; Lacan, Ernest; and Zola, Emile.

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POLLOCK, ARTHUR JULIUS (1835–1890), HENRY ALEXANDER RADCLYFFE (1826–1889), AND SIR JONATHAN FREDERICK (1783–1870)

English

Baron Pollock was Lord Chief Baron of the Exchequer and succeeded Sir Charles Eastlake as second president of the Photographic Society from 1855 to 1869. Sir Frederick insisted that photography should be called a practical science rather than an art and we have him to thank for suggesting that the society should form a permanent collection. He married twice and had a very large family. Henry was the eleventh child from his first marriage, Julius was the thirteenth and the first son of his second marriage. Like their father, both sons were members of the Photographic Society of London.

Henry was educated at Trinity College, Cambridge and became Master of the Supreme Court of Judicature. He published 'Directions for Obtaining Positive Photographs upon Albuminized Paper' in the Society's Journal in1853 and a glycerine process for dry-collodion plates in 1856. As well as conventional half-plate prints he produced stereo images and there are thirteen examples in the Getty Collection.

Both brothers photographed at the family home Hatton, west of London and in North Devon. The half-brothers were obviously close and in 1860 Henry married Amelia Bailey from Lynton in North Devon and Julius married her sister Ellen a year later.

Julius was educated at Kings College, London, and trained as a physician. He made photographic studies of people with deformities and an album of his work is in the collection of the Royal College of Medicine.

IAN SUMNER

PONTI, CARLO (c. 1822–1893)

Optician and photographer

Carlo Ponti, optician and photographer, was born in Sagno in the Canton Ticino around 1822–1824. As an adult he moved to Paris, where he worked in the Cauchoix studio for about five years. He then moved to Venice for good in 1852 and opened a little optician's shop in piazza San Marco 52. His high quality products soon made him famous throughout the Veneto province, and for many years he had sole rights on some of them. He began to expand in many directions, working as an optician, or creating and built instruments for astronomy and physics and photographic lenses (especially for panoramic shots). He sold his own creations, as well as those of other companies; and was a photographer, editor and distributor of photographic prints, both his own and others. Thus he was a versatile personality, informed and attentive to scientific innovations, the demands of the market and progress in know-how in the field of photography. He enlarged his store, and his clientele and sales grew. He became famous, and obtained various forms of recognition: on 30 May 1854 he was awarded a silver medal for photographic equipment, lenses in particular, at the Esposizione Industriale Veneta (industrial exhibit for the Veneto province). In the same year he started to photograph Venice with a systematic thoroughness, and in 1855 he already had a catalogue of 160 photographic views of Venetian architecture (*Guida fotografica illustrata della città di Venezia*), each with a historical and aesthetical caption. An introductory text goes through the evolution of Venetian architecture. Ponti presented the work at the Universal Exhibition in Paris in 1855 as a photographic history of the various architectural styles typical of the city, and he won a prize for it. His multifarious career made it necessary for him to collaborate with different people, like Francesco Maria Zinelli and Giuseppe Beniamino Coen. He also worked with the most important photographers in Venice, like Carlo Naya (1816–1882), Domenico Bresolin (1813–1899), and Antonio Fortunato Perini (1830–1879). Domenico Bresolin, painter and photographer, studied at the Accademia di Belle Arti in Venice. Ever since the 1850s, he had concentrated his efforts in the calotype process, doing important views of the monuments of Venice. His photographic prints, which he also did as albumen prints, are among the best in the period in terms of their definition and the quality of the printing. In 1864 he obtained the chair in landscape at the Accademia (the position had formerly been held by Francesco Bagnara), and stopped taking photographs. In that year, Bresolin handed over his studio and archive to Carlo Ponti, who then distributed the other photographer's images with the "Ponti" stamp, thus creating quite a few attribution

problems. Ponti then handed Bresolin's studio over to Giovanni Brusa. Antonio Fortunato Perini collaborated with Carlo Ponti after 1854, and he probably did some of the photographs in the catalogue Ponti presented at the *Exposition Universelle* in Paris in 1855. Perini was among the first to open a photographic studio in Venice and to spread the albumen print technique. He was especially concerned with the photographic reproduction of the manuscripts and miniatures in the Biblioteca Marciana.

Carlo Naya opened his photographic establishment in Venice in 1857. He worked with Ponti from that time onwards, furnishing Ponti's shop with photographic prints which were often pubished by Ponti with his own trade mark, and, as in the case of Bresolin, considerable confusion occurred in this case, too. Together with Ponti, he also published several albums of views, among which were the *Vedute di Venezia*, which came out the day after the Veneto was annexed to Italy in 1866.

Ponti did his photographs between 1854 and 1875. He took shots not only of Venice, but also of other places in northern Italy, and, between 1860 and 1865, Rome. He published other catalogues of his works, the *Catalogo di fotografie delle principali vedute* in 1864 and, in 1872, the *Catalogo generale delle fotografie*.

In 1860, he created a special viewer for large format photographs, the *Aletoscopio* (from the Greek: "precise view"). In 1861 he presented it to the Société française de photographie and, on 14 April of the same year, to the Istituto di Scienze, Lettere ed Arti in Venice, where he earned honourable mention in May. On 11 January 1862 Carlo Ponti obtained sole rights for his invention and began to sell it. Later, he created different variants, like the Megaletoscopi*o*, a bigger version of the Aletoscopio, which he had finished in 1862. For the new invention, he was awarded the Grand Prix at the Great International Exhibition in London that year. He registered the trade mark on 10 July of the same year, entrusted the manufacture of the apparatus to the cabinet maker Demetrio Puppolin and then promoted sales. He also made a special version of the Megaletoscopio, the Megaletoscopio privilegiato, to see slightly curved photographs. Both the Aletoscopio and the Megaletoscopio—and their variants—made it possible to see the same images enlarged by lenses, and with two different effects: the "day effect," with reflected light, and the "night effect," in transparency. In this last case, the photograph was reinforced on the back by other sheets of paper painted in different colours and pierced with little holes. The whole, illuminated from the back, changed the colours and light of the positive image, creating a "night effect."

In 1866 Carlo Ponti became the official photographer of His Majesty Vittorio Emanuele II, when the Veneto became part of the Italian nation. His growing business enabled him to open branches in other cities: Paris, London, Liverpool, Berlin, Stuttgart, Lyons, New York, Chicago, Philadelphia, Boston, Montreal, and San Francisco. At this time Ponti lost sole rights on the sales of the Aletoscopio and its variants because of the administrative uncertainty in which the Veneto found itself in the years following the annexation. In fact, an apparatus now housed in the Musée Suisse de l'Appareil Photographique in Vevey bears the trademark of Carlo Naya, who, copying Ponti's models, had begun to manufacture and sell the Aletoscopio. This initiative got him involved in a long legal battle in 1868, and Ponti used every means he could to get Naya sentenced. From 1868 onwards, then, the collaboration between the two photographers stopped. Until 1876 Ponti tried to get back sole rights on his creation, but without any success. He made, however, countless variations on his first apparatus, and gave them highly original names: Amfoteroscopio, Dioramoscopio, Pontioscopio, Cosmorama Fotografico are only a few examples.

The invention of the Aletoscopio must be placed together with those inventions that, slowly and well before the 19th century, led from the static image to the image as something with movement, and, to cinema. Ponti played an active part in this story, from the moment that stereoscopic photography began to be widespread and the subsequent experiments that increasingly expanded the potential range of expression of photographic images.

Carlo Ponti died in Venice on 16 November 1893; he was blind by that time, but had spent many long years of his life in a profession he had taken up out of passion and honesty.

The Museé Suisse de l'Appareil Photographique in Vevey houses an exemplar of the Megaletoscopio, accompanied by twenty albumen prints attributed partly to him and partly to Carlo Naya. More of his photographs are in public and private collections (Fototeca della Soprintendenza per il Patrimonio Storico, Artistico e Demoetnoantropologico, Brera, Milan; Museo di Storia della Fotografia Fratelli Alinari, Florence; Dietmar Siegert Collection, Münich; Wilfried Wiegand Collection, Frankfurt am Main; Department of Photography, J. Paul Getty Museum, Malibu).

SILVIA PAOLI

Biography

Carlo Ponti was born in Sagno (Canton Ticino) sometime between 1822 and 1824, and died in Venice on 16 November 1893, by which time he was already totally blind. At present, research has not turned up very much about his life or training. We only know that he went to the Cauchoix studio in Paris for five years, studying as an optician and photographer. He set up residence in

Venice, where he worked as an optician, photographer and publisher of photographic prints, but he never gave up his Swiss citizenship. He soon became rich and famous, and this led him to open branches of his firm in Paris, London, Liverpool, Berlin, Stockard, Lyons, New York, Chicago, Philadelphia, Boston, Montreal, and San Francisco. He showed his photographs and the lenses and apparatuses he invented at the main exhibits of the time: Venice 1854, Paris 1855, London 1862. He became famous through his invention of a special instrument for viewing enlarged photographic images, the *Aletoscopio,* and he created various versions of it. He published several catalogues of his images in 1855, 1864, 1866, and 1872. Ponti was a well-read, multifaceted personality, and was always interested in the latest scientific and cultural developments of his time.

See also: Bresolin, Domenico; and Perini, Antonio.

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PONTON, MUNGO (1801–1880)
Inventor and polymath

The Scottish lawyer Mungo Ponton was the inventor of a photographic process that was to lead to developments that would have a huge impact on the visual culture of the nineteenth century and beyond through the mechanical reproduction of photographic images.

The announcements in January 1839 by Louis Jacques Mandé Daguerre and William Henry Fox Talbot of the discovery of photography created a ferment of interest in Edinburgh, Ponton's home-town. Edinburgh had just gone through a period of intellectual prominence, known as the Scottish Enlightenment, which had seen a flourishing in the arts and sciences and many gifted and able scientists were keen to experiment with the new discovery. The meetings of the Society of Arts for Scotland, which had been founded by Sir David Brewster in 1821, was the forum for discussion of the invention of photography in the months following the announcements of Daguerre and Talbot.

Ponton had began experimenting with Talbot's process and this was when he made his remarkable discovery, which he presented to a meeting of the Society of Arts for Scotland on 29 May 1839. His paper was titled "Notice of a cheap and simple method of preparing paper for Photographic Drawing, in which the use of any salt of silver is dispensed with." What Ponton had discovered was the light sensitive qualities of potassium dichromate. This was to be the basis of many mechanical means of the reproduction of photographs and of producing permanent images.

Ponton had found that a piece of paper soaked in potassium dichromate was sensitive to light and an object place on the surface would leave an outline with gradations of tone "according to the greater or less degree of transparency in the different parts of the object." Fixing was simply a matter of washing in water when those portions which had been acted on by the light readily dissolved and those exposed were completely fixed. Ponton did acknowledge that the process was not sensitive enough to be used in a camera.

It is not known if Ponton realised that the potassium dichromate solution he was using was combining with the gelatine used to size the paper to create the chemical reaction. However, of particular importance for the development of Ponton's process, and its use in future printing techniques, was that he did not try to patent his discovery but on the contrary made it available and it was published in the *Edinburgh New Philosophical Journal* in July 1839 and widely reproduced.

Those who experimented with Ponton's discovery included Talbot, Edmond Becquerel, Alphonse Louis Poitevin and John Pouncy, who all took out patents for the processes they developed. Talbot in particular appreciated the important part played by gelatine. Joseph Swan also patented his carbon process and later recalled that his first attempt at photography was after reading about Ponton's process in a weekly journal and that he was not slow to grasp the underlying principle. In 1840, at the age of seventeen, M Carey Lea, who was to become one of the leading American photographic scientist in the nineteenth century, used Ponton's process to produce a series of photogenic drawings. The album of these is in the Franklin Institute, Philadelphia.

Ponton deserves the accolade of a pioneer of photography although he left it to others to exploit the use of potassium dichromate and the processes that were a

direct consequence of Ponton's discovery include; gum bichromate, carbon printing, photogravure, Woodburytype, Autotype and collotype. The mechanical production of photographs made them widely available and easily accessible with a huge impact on visual culture up to the present time.

The potassium dichromate process was not Ponton's only involvement in photography. In March 1840 he reported to a meeting of the Society of Arts for Scotland that he achieved a daguerreotype image on lithographic stone. In 1845 he won the Society's silver medal for his process on how to register the hourly variation in temperature on photographic paper. (He had already received a silver medal in 1838 for his improvements to the electric telegraph.) Also in 1845 he described a variation of the calotype process for portraiture allowing shorter exposures.

No known photographic images by Ponton are known to exist although these must have been produced in the various processes he used. Various items belonging to him, comprising drawings and publications as well as a photograph of him, aptly a carbon print, and a portrait oil painting by Samuel Mackenzie, are in the Scottish National Photographic Collection at the Scottish National Portrait Gallery, Edinburgh.

The combination of a busy business life and his amateur scientific experimenting took a heavy toll and Ponton's health and he suffered a major breakdown in about 1845. He had to retire from his legal work and by 1846 had moved to the milder climate of Clifton, Bristol, England, where he was to remain until his death. He was more-or-less an invalid for the rest of his life and much of the time he was house-bound, describing himself in correspondence as a "close prisoner." However, his physical limitations did not effect the activity of his brain. He had become a Fellow of the Royal Society for Edinburgh on 20 June 1834 and presented papers on polarisation and micrometry. He subsequently devised a photometer and presented a paper about this to the Society in 1856. In 1859 and 1860 Ponton presented papers to the British Association for the Advancement of Science on the laws of chromatic dispersion and the wave-lengths of the solar spectrum. He contributed articles to various journals and was responsible for a number of publication on scientific and religious themes including a mingling of the two. The titles were: *The Sanctuary—Its Lessons and Worship (*1849), *The Material Universe: Its Vastness and Durability* (1863), *The Great Architect; as Manifested in the Material Universe* (1866), *Earthquakes and Volcanoes* (1868), *The Beginning: Its When and Its How* (1871), *Glimpses of Future Life* (1873), *Songs of the Soul: Philosophical, Moral and Devotional* (1875) and *The Freedom of the Truth* (1878). In *Songs of the Soul* there is hymn "Praise God who roused the quivering light" which is a celebration of photography.

RODDY SIMPSON

Biography

Mongo Ponton was born at Balgreen, Edinburgh, on 20 November 1801, the son of a farmer. After his schooling, most likely at the Royal High School of Edinburgh, he became a legal apprentice and on 8 December 1825 he was admitted to the Society of Writers to the Signet, an ancient legal fraternity dating back to the fifteen century. Ponton showed commercial acumen as well as scientific innovation and was a founder of the National Bank of Scotland and became its secretary. On 24 June 1830 Ponton married Helen Scott Campbell, the daughter of the brewer, Archibald Campbell. The couple had seven children: Elizabeth born on 8 April 1831, John on 20 March 1832, Archibald Campbell on 9 June 1833, Alexander Campbell on 30 September 1834, Mungo Stewart on 31 August 1836, Bethia Katherine on 28 July 1838 and Matthew Moncreiff on 19 March 1841. Ponton's first wife died on 7 August 1842 and on 7 November 1843 he married Margaret Ponton, to whom he may have been related, the daughter of Alexander Ponton who was a solicitor. A son, Thomas Graham, was born on 28 August 1844. Ponton married for a third time on 1 August 1871 when his bride was Jane McLean the daughter of an Edinburgh merchant.

Ponton died at his home 4 Paragon, Clifton, Bristol on 3 August 1880. Of his children, John became a newspaper editor in the United States while Archibald became a prominent architect in Bristol and inherited at least some of his father's interest in photographic experimentation. In 1908 Archibald won the silver medal at the Tunbridge Wells Arts and Crafts Technical Photographic Section for the discovery of Autochromatic Shadow-Graphs.

See also: Poitevin, Alphonse Louis; Pouncy, John; Talbot, William Henry Fox; Carbon Print; Collotype; Gum Print; Photogravure; and Woodburytype, Woodburygravure.

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PORNOGRAPHY

Origin, production, and market

Pornography is the presentation of the nude body, or of sexual behaviour designed to arouse the viewer's excitement. The tradition of pornographic images can be traced back to the first-century fresco found in a Pompeii brothel. In the nineteenth century, the invention of photography provided an unprecedented realistic quality, and it was not long before this invention was adopted to represent nude figures, for the purpose of academic study or of erotic pleasure. Pornography as a genre shares many common features with two other categories, viz. erotic photography and photographs of the nude, and the attempt to clearly differentiate them has proved extremely difficult, for the realism and indexical quality of photography have broken down the division between the transcendental and the transparent, undermining the legitimate status of the naked body in visual presentation. In the endeavour to define these genres, the aesthetic quality presented in the pictures and the purposes behind their production can serve as important criteria: while nude photography displays the ideal beauty of the human body (whether successfully or not) and closely allies itself to academic art, erotic photography is intended to elicit sexual responses from the viewer, while avoiding an explicit presentation of the sexual act. In the genre of pornography, sexual scenes and the explicit display of bodily private parts become indispensable themes, and the aim is the gratification of the viewer's psychological and physical pleasures. Such pictures have proved to be disturbing to many viewers and, as Martin Myrone suggests, while erotic art is regarded as realistic, concerned with love, and of supreme technical excellence, pornography is considered to be crude (in its means of expression), unreal, brutal, and ugly (Myrone 2001, 31).

Even if pornography is assigned to a different category from nude and erotic photography, the three genres were initially difficult to separate, and they may actually come from the one original source—nude photography. In 1841 Lerebours opened a studio in Paris, advertising the first photographic nude under the name of 'academies' thus is considered as the first nude photographer. The period following1845 witnessed the blossoming of nude photography produced by professional studios. Owing to the controversial nature of this art-form, many nude pictures remain anonymous, and they are difficult to date precisely. Furthermore, only a small number of photographers are known for their erotic or pornographic production: Auguste Belloc, Bruno Braquehais, Felix Jacques-Antoine Moulin**,** Giacomo Caneva**,** Jean-Louis-Marie-Eugene Durieu**,** Julien Vallou de Villeneuve**,** and Louis Jules Duboscq, have produced commercially-oriented erotic and pornographic photography.

Continental countries such as France, Italy, and Holland, being more tolerant of obscene images than Victorian Britain, have been the major suppliers of these images, and Paris became the unchallenged centre of the erotic photography industry, exporting its product throughout Europe. For wealthy tourists, Paris provided easy access to browsing obscene, bawdy, and pornographic works. Certain studios in Paris would accept commission from customers to make nude photographs according to their special requirements. Daguerreotype nudes could be bought in opticians or from street vendors around a certain area (e.g., the Palais Royale in Paris). As for the more explicit, pornographic images, the luxury brothels in both Paris and London were the venues where these could be acquired. The prosperous pornography industry was, however, by no means given the seal of official approval. Distributors of pornography had to perform their activity discretely to avoid police interference. Regulations against, and censorship of, pornography were suggested and implemented from time to time. In Britain, Lord Campbell, recognising that pornography was a cause of social disorder, proposed the Obscene Publication Act in 1857, in the hope that the production and distribution of pictorial and literary pornography would be brought under control. In France, the authorities tried to draw a line between academic study of the nude and pornography. Nude photography could be sold, under the title of academic study, but only within the walls of the Ecole des Beaux Arts. The so-called soft-core erotica could be openly sold, but its legality was based on ambiguous guidelines, and the vagaries of the government censors decided whether it was pornography or not (Godeau 1986, 94).

It is difficult to say exactly how many erotic and pornographic pictures were made during the nineteenth century, since this production was underground and not officially recorded. Nonetheless, the mass production and wide market can be gauged from reports of several police raids of 'dirty photos.' One of the most famous cases is the raid made on Henry Hayler at his Pimlico studio in London. As the *Times* court report of April 20, 1874, pronounced, the police seized

> no less than 130,248 obscene photographs. Mr. Collette said the defendant had been for years engaged in this traffic. Hayler and his wife and family were themselves represented in the photographs. The man went round to dealers with miniatures photographs numbered, and they were ordered of him in large and small quantities.

Across the Atlantic, around 194,000 obscene photographs, together with 5,500 indecent playing cards, were seized by Anthony Comstock, a special agent of the US Post Office, in 1873–74 alone.

Although the market of pornographic pictures proved to be large, in the early years the audience was limited to the upper-middle class, owing to its rather high price.

For example, a tinted erotic stereograph plate cost some 20 francs, and explicit scenes would cost more, while the average daily wage of a worker in the 1850s was around 3 francs (Richter 1989, 88). Daguerreotype pornography was often exquisitely hand-coloured, exhibiting careful arrangement of lighting and the model's pose. Together with the singularity of each plate, such a daguerreotype was designed as a personal deluxe item to be enjoyed by the privileged.

In order to meet the growing demand and to expand the market further, the photographers of the period were inspired to produce less expensive stereoscopic cards on salted paper, which is more commercially attractive than daguerreotype nudes. Notwithstanding, it was not until the 1880s and the appearance of a new, cheaper format of pornography—the postcard—that the working class generally gained access to pornography. Unlike stereoscopes, postcards require no special viewing apparatus. They are financially affordable, even to the poor, and have the ability to communicate through their images and the written messages they carry simultaneously. For the first time, the working class became consumers rather than merely objects of pornography (Sigel 2000, 860).

Style and Model

Nineteenth-century pornographic pictures share great similarities in terms of their composition and style. This may be due in part to the rather narrow subject-matter, which is mostly of a secret, sexually allusive nature. A female model is often placed in the setting of a private bedroom or toilet, photographed as if she were caught in the process of undressing or, in some more explicit pictures, displaying her private parts and caressing herself in a sexually arousing way. A large dressing mirror is commonly used in the setting; not only is it a necessary furnishing in such a room, it also performs the function of reflecting more of the model's body to the viewer. Feminine items such as jewellery, flowers, drapery, and lace also serve as indispensable decorations on the model, enriching the picture with details and also providing a vivid contrast of texture from the naked flesh.

Pornography that shows explicit sexual activities largely follows the mode already present in graphic art. Images of coitus, oral sex, and masturbation appearing in pornographic photography could all be found in earlier and contemporary prints. Nevertheless, the technique of photography does influence the mode of representing sexual scenes and requires certain necessary modifications, therefore resulting in a repertory of pose, which becomes in a sense more limited (Godeau 1986, 96). For example, while the traditional pornographic print had displayed sexual activity, photographic pornography would show a fragmental part of the woman's body or the detailed, focused presentation of intercourse of man and woman. Such depiction of a fragmental body rather than of full-scaled sex in action is the result of the long exposure-time required by early photography. In some cases, photographers adopted a serial format to present sexual activity in progress and provide it with a storyline: for example, a French pornographic 'Wedding Series,' presently held in the Kinsey Institute's archive, shows the newly-wed couple undressing, caressing each other, and having sex, in three continual pictures. The viewer would therefore observe these pictures with the anticipation of watching a drama. As Linda Williams argues, such continuum pornography attempts to render the "truth" of sex not as an exhibitionistic pose but as an act (Williams 1995, 27). Later in the century, with the development of more instantaneous forms of photography and shorter exposure lengths, the models would appear to be literally 'caught in the act' (Williams 1995, 31), and such sexual acts gradually became a staple of photographic pornography.

Beside the sexual act between man and woman, gay or lesbian sex constitutes a smaller, but undeniably significant aspect of the pornographic repertoire. To the heterosexual viewer, such gay porn not only provides a deviant sexual spectacle, but also violates the patriarchal order by blurring the boundary between the active/passive, male/female divide which is often presented in heterosexual porn. To modern researchers, gay pornography of the nineteenth-century suggests a new way to understand contemporary sexuality, as will be discussed below.

Pornography and Its Spectatorship

Although the proliferation of mass-produced pornography in the nineteenth century has been acknowledged, it was not until the 1960s, when there emerged some alternative views about Victorian values, many of them of feminist origin, that these 'dirty photos' begin to receive serious attention. To researchers, pornography seemed to open a new path to understanding nineteenth century histories, especially those of society, gender, sexuality, class, and even colonialism. Among these, the long-held impression of prudent Victorians in sexual denial was questioned from time to time, through the study of pornography and other unearthed literature. It is suggested by Steven Marcus in his *The Other Victorians* that these materials evince the dark Freudian underside of Victorian values, or as Michel Foucault proposes in his *History of Sexuality*, paradoxically constitutes a part of the vast apparatus of production of sexuality.

On the other hand, when the history of pornography itself is concerned, the indexical, excessively realistic quality of photography has made these pornographic pictures quite distinct from pornography in traditional formats such as print or painting. In Abigail Solomon-

Godeau' s view, such images do not represent an extension of an existing tradition of erotic and pornographic images, but rather constitute a whole new genre, one made possible only with the invention of photography and the new status of the photograph as trace of the real (Godeau 1991, 229). As such, previous ways of reading images are no longer sufficient, and the demand arises for novel approaches to supply interpretation for this new genre. Some have tried to study these images in the light of feminist film theory, focusing on the key role of the spectator in the whole operation and production of pornography. This is not only because much of pornography's arousing effect is achieved in the eyes of the viewer—which explains in part why the separation of erotic pictures from dirty ones is often a controversial issue—but also because the spectator is regarded as directly exercising his active power over the female object as the result of photographic technology, which seemingly provides the real presence of the woman's flesh. When it comes to stereoscopic porn, the secretive voyeurism and the sensational tactile illusion offered by the apparatus enhance the visual pleasure even further, and the objectification of the woman's body becomes inevitable.

There are yet other ways of viewing nineteenth-century pornography where the spectatorship is concerned. Some theorists are not satisfied with the fact that the viewer is homogenised as an active and masculine master in male-gaze theory, recognising that there are impasses in the theory which would handicap the study of other important audiences of pornography, such as the female viewer. Although women were unlikely to be the targeted audience of pornography, wide dissemination made it impossible for them to avoid the sight of pornographic images. Upper-middle-class women seem to have had ready access to pornography, and with the emergence of pornographic postcards from the 1880s, even working-class women could afford a sexual spectacle if they so wished. Such an 'unnatural,' outrageous scene of woman looking at pornography, and even sharing the male attraction to pornography, has proved especially disturbing. According to Walter Kendrick, this historically new phenomenon of woman as porn observer may well have been the real cause of the alarm felt by moral defenders, which triggered a series of trials and regulations on obscene materials, both in France and Britain. In the contemporary study of nineteenth-century pornography, however, the significance of the female spectator and her relationship to these images is surprisingly ignored. Williams suggests that the omission may be ascribable to the dominance of the "male gaze" model, which fails to consider "a plurality of differently disciplined spectator-observers seduced in different ways by a range of erotic-pornographic images" (Williams 1995, 22). Such an omission is observed to have also happened in the case of gay porn and gay viewers. The male gaze model of interpreting pornography, however, does provide a way of seeing how these marginalised images might have helped to consolidate the social order, be it of gender or class, by showing the stereotypical relationship between man and woman. On the other hand, the challenge to such an approach not only proposes to interpret these images from multiple viewpoints, but also suggests how pornography might actually be the focus of a subversive spectatorship. No matter what kind of approaches are taken to understand these images, nineteenth-century pornography has claimed an important role in the study of contemporary history, reminding researchers, through its controversial nature, of the possibility of a more fluctuating social relationship.

KUEI-YING HUANG

See also: Erotic Photography; Nudes; Moulin, Félix-Jacques-Antoine; Caneva, Giacomo; Durieu, Jean-Louis-Marie-Eugène; Vallou de Villeneuve, Julien; and Duboscq, Louis Jules.

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PORTER, WILLIAM SOUTHGATE (1822–1889)

American photographer

At the Great Exhibition of 1851 at London's Crystal Palace, a panorama of the Cincinnati waterfront was exhibited. Comprising eight separate whole plate daguerreotypes, the panorama measured over five and a half feet in length, and was of a quality so high that historians have been able to identify every vessel moored along the banks. The panorama was photographed across the river from the rooftop of a building in Newport, Kentucky, by Charles H Fontayne and William Southgate Porter in September 1848.

Porter had first worked with Fontayne in his Baltimore studio in 1844, and after Fontayne moved to Cincinnati in 1846, appears to have operated the studio alone until, in the spring of 1847, he opened another studio—Porter's City Daguerreian Gallery—in Pittsburgh. By late 1847 he had employed S. Hoge as an assistant, but by the spring of 1848, he had sold the Baltimore studio to Hoge and worked in Pittsburgh, where on May 22 he produced another remarkable panorama— comprising seven whole plate daguerreotypes—of Fair Mount Waterworks. This time the images were vertical and presented in a mount measuring 367mm x 998mm.

He rejoined Fontayne in Cincinnati later that year, and their partnership lasted until 1852, when Fontayne once again left the business. After a succession of other partners, he operated alone after 1863 from several addresses.

JOHN HANNAVY

PORTUGAL

The first news of the discovery of the technique of fixing images obtained with a camera obscura arrived in Portugal in 1839 through periodicals imported from France and the United Kingdom. In the same year Portuguese periodicals published notices presenting the calotype (*Revista Literária*, Porto, March 1839) and the daguerreotype (*O Panorama*, Lisbon, May 1839) processes The earliest recorded photograph taken in Portugal dates from 1841, a daguerreotype portrait taken by the English painter, William Barclay. In the early years, all equipment was imported, and experiments with the daguerreotype process were conducted in several institutions from ca.1842, including the physics department of the University of Coimbra.

During the 1840s and 1850s some European daguerreotipists, mainly French, travelled through Spain and Portugal, to make a business in portrait photography. Amongst the first in itinerant photography of the two first decades were Blackwood (Porto, 1843–44), the French Giles (Lisbon, 1843–44), Madame Fritz (Lisbon, ca.1843–45), E. Thiesson (Lisbon, 1844–45), who did a lot of commercial portrait photography in Lisbon and took some photographs of Africans with an anthropological approach, Adolpho and Anatole (Lisbon and Porto, 1845), Chambard & Poirier (1846), Dubois & C.ª (Lisbon; Porto, 1849; Coimbra, 1855, 1856), Juliette de Humnichi (1851), P. K. Corentin (Porto, 1851, 1853, 1856; Lisbon, 1851–52; Coimbra, 1852; Minho province, 1853), who taught photography and wrote the *Resumo historico da photographia desde a sua origem até hoje* (1852), the first photographic book published in Portugal. Some found here conditions for a more permanent business like the French Pedro Cochat (1849–57), J. Rodrigues Marten (ca.1849–53) or Martin (1857–63), Louis Monnet (Porto, 1856–62; Braga 1856–57, 1861; Coimbra, 1859), probably the first to do stereoscopic work and instantaneous photography in these towns, Alfred Fillon, established in Porto (1857–59), and then in Lisbon (1859–ca.69, ca.71–81). Wenceslau Cifka was probably the first to open a permanent photographic studio in Lisbon (1848–ca.80). To improve their incomes, some of these early foreign photographers made digressions to take portraits in the province where there weren't any established photographers. Many gave photographic lessons and sold photographic apparatuses, performing a major role in the formation and establishment of the first Portuguese photographers. These also established their businesses in the main cities: Francisco Augusto Metrass (Lisbon, 1847–ca.1848), Lucas de Almeida Marrão (Lisbon, 1851–97), Miguel Novaes (Porto, 1854–68), also painters, Francisco Augusto Gomes (Lisbon, 1852–71), Vicente Gomes da Silva (Funchal, Madeira island, ca.1848–1906), and António da Conceição Matos (Coimbra, 1856–69), also a painter. While most of these photographers offered only daguerreotypes, some also offered prints from paper and glass negatives—albumen on glass and wet collodion—and ambrotype positives In this early period there were already a few amateurs like the Count of Farrobo (1849), the painter João Baptista Ribeiro (1852–54) and Carlos Alexandre Munró (1857–66). Calotype practicionners were rare in Portugal. We should mention the British amateurs Frederick William Flower (ca.1853–58), and Joseph James Forrester (ca.1854–59), both in Porto. Forrester was also the author and editor of the earlier known Portuguese publication illustrated with a tipped-in photographic print (1855).

In the 1860s, with the popularity of the carte de visite format, a reduction in costs, and the popularity of the

family album, there was an exponential increase in the number of photographic studios in the main cities. Some former portrait-painters became part or full time photographers. Between the most significant photographers of this decade, for their quality and production, were Lisbon's studios of the Club Photographico Lisbonense (1860–62), Santa Bárbara (ca.1865–70s), Joaquim Coelho da Rocha (1865–91), José dos Santos Loureiro (1863–80), Francesco Rocchini (1865–93), a former cabinetmaker who also built photographic cameras and other apparatuses on demand, the Swedish M. J. Schenk (1850s–80), also a painter, who introduced here the diamond cameo portraits in 1867, and José Nunes da Silveira (ca.1860–67), who introduced the wothlytype process in Portugal and Spain in 1864, António da Fonseca (1862–92), Photographia Universal (ca.1866–1900), and Augusto S. Fonseca (1868), Porto's studios of the German Martin Fritz (1859–ca.1874), Henrique Nunes (1861–66), José da Rocha Figueiredo (1863–69), Photographia Nacional (1865–74), Photographia Talbot (1865–79), Sala & Irmão (1863–ca.94), Pinto & Ferreira (1863–67), Manuel José de Sousa Ferreira (1868–1906), and José Joaquim da Silva Pereira (1870–81), Coimbra's studios of Arsène Hayes (1863–74), and José Maria dos Santos (1869–1900), Braga's studio of Matias António de Magalhães (1864–69), Guimarães's studio of António Augusto S. Cardozo (ca.1860–78), also a painter. Madeira island's João Francisco Camacho (1863–92), Luanda (Angola)'s Abílio Moraes (ca.1863–ca.72), followed after his death by his widow and their sons. As in other countries Portuguese photographic studios were essentially supported by the studio portraits.

Eduardo Knopfli and Jacques Wunderli kept doing itinerant work throughout the country since the early 60s and throughout the 70s, although in the 80s we find the second established in Viseu and Braga. Secondary towns register the passage of occasional itinerant photographrs from early dates, but only had their first permanent studios in the sixties. We should also mention the amateur photographers Carlos Relvas (ca.1862–ca.93), Filipe Mesquita who made a large series of stereoscopic views of Lisbon (Lisbon, early 1860s), Russell Gordon (1861) and Amélia de Azevedo (ca.1863), both in Madeira Island. Worth of remark was also José António Bentes, a military officer who wrote a manual (1864) and a treatise of photography (1866). This decade foreign photographers made significant views work in Portuguese territory like the stereoscopic series taken by R. A. Miller/Miller & Brown in Açores archipelago, or J. Laurent, large format views and stereoviews (ca.1868–69).

In the late 1850s, and throughout the 1860s, several important series of architectural and topographical photographs were produced. Eugène Lefèvre took views of the main cities and monuments and made an *Album de Portugal* (1857). Some individuals belonging to the cultural elites of the time, inspired in foreign photographic inventories of patrimonial works, were personnally commited in the register and inventory of Portuguese monuments, like Antero de Seabra, an amateur photographer, who took photographs of monuments, urban landscapes, as part of a personal project (ca.1858–64), and public works for the Ministério das Obras Públicas (ca.1861–64). He printed a series of photographs under the title *Portugal*. Joaquim Possidónio Narciso da Silva, architect of the royal house and archeologist, also photographed Portuguese monuments, archeological sites and objects and edited them in the *Revista Pittoresca e Descriptiva de Portugal* (1861–63). The British Charles Thurston Thompson photographed monuments in Porto, Coimbra, Batalha Alcobaça, Tomar and Lisbon, for the South Kensington Museum of London (1866). In 1866–67, 1877 and 1879 Carlos Relvas photographed Portuguese monuments and landscapes by his own iniciative. Both published some of this work in the photographically illustrated periodical *Panorama Photographico de Portuga*l (1869–74). Diogo (or Jacques) Francem photographed monuments for the Portuguese section of the Paris 1867 international exhibition (1865–67). Henrique Nunes photographed monuments and archeological pieces published in the book *Monumentos Nacionaes* (1868) and latter in the *Boletim da Real Associação dos Architectos Civis e Archeologos Portuguezes* (1874–82), Francisco Martins Sarmento documented his pioneer archeological works (1868–76), and Augusto Xavier Moreira took a series of views of the monuments of Lisbon (1865–68), sold both individually and in albums. The Lisbon photographers Augusto César Pardal and his son published reproductions of art objects and engravings reproducing famous paintings (1869–79).

The early 1860s saw the first publications illustrated with tipped-in photographs, predominantly carte-de-visite size albumen prints, depicting authors and other celebrities—continuing a publishing tradition which had previously depended on engravings. The publication of such editions reached its peak in late 1870s and early 1880s, the tipped-in photographs being replaced by collotype illustrations in the 1880s, and eventually photogravure.

Amongst the most significant photographers who opened their studios in the 1870s were Lisbon's studios of Photographia Popular (ca.1870–99) who worked in several processes, including carbon and photo-mechanical prints, Alfred Fillon (2nd studio, ca.1871–81), Ricardo Pereira de Melo Bastos (1872–85), António Maria Serra (1872–1900), Photographia Central (1872–1900), Damião da Graça (ca.1872–1900), Martin Fritz (ca.1874–ca.1888), Henrique Nunes (ca.1869–83), João Francisco Camacho (1879–98), Porto's Photographia Universal

(1870–1900), Photographia da Casa Real of Emílio Biel (ca.1874–1900), União (1872–1900), and Célestin Bénard (1869–90), Coimbra's studios of J. Sartoris (1876–1900-) and Adriano da Silva e Sousa (1876–1900), Braga's António Pereira da Silva Braga (1870–79), Viana do Castelo's José Joaquim Ferreira (1870s–80s), Póvoa de Varzim's António José de Barros (1874–94), Tomar's António da Silva Magalhães (ca.1871–97), Ponta Delgada (Açores)'s António José Raposo (ca.1870s–91), Luanda (Angola)'s José Nunes da Silveira (ca. 1869–78), and José Augusto da Cunha Moraes (ca.1877–97), José R. Gambôa in Moçambique and S. Tomé (1875–95), and Maria Eugénia Reya Campos, self-entitled the first Portuguese woman photographer, who's activity goes back at least 1872, established in Évora (1881–82), and in Lisbon (1885–1900-). In this decade the French photographers and editors J. Lévy & C.ª published extensive series of images of Portugal in several formats, including glass and paper stereoviews and magic lantern slides (ca.1875). Lachenal & Favre (1871– ca.82) and Adolphe Block also edited stereoviews of Portugal. Amongst the relatively small number of amateurs we should mention José Gil (ca.1876–1905) and Maria Collecta d'Assumpção Pacheco, (Elvas, ca.1876, 1892).

With the consolidation of photographic business in the main cities, from the seventies to the end of the century, we assist to the progressive establishment of photographic studios in small towns, seaside resorts, and spas. Some of them formerly had studios in the main cities and many worked as collaborators of the main photographers. Seasonal activity became common among some city photographers who every year opened temporary photographic studios in these places, accompanying the public affluence in the respective seasons. The regional spreading of photographic studios continued progressively towards the end of the century, and some small province towns only had their first permanent studios in the following century.

In the 1870s José Júlio Rodrigues, professor of chemistry at the Polytechnical Academy and responsible for the photographic section of the *Direcção Geral dos Trabalhos, Geodésicos, Topographicos, Higrographicos e Geológicos do Reino*, had a major role in the experimentation and introduction of several photomechanical processes. He organized the first national photographic exhibition in these installations (1875), published the book *Procédés photographiques et méthodes diverses d'impressions aux encres grasses* (Paris, 1879) and started making experiments with the collotype process in 1874. Carlos Relvas introduced in Portugal the Carl Heinrich Jacoby's collotype variant in 1875. Emílio Biel & C.ª Porto's important photographic studio learned the technique and used it to illustrate many books and several albums (1880s–1900s). Biel's house investment in this technique has attainned unrivaled mastering in Portugal.

Amongst the most significant photographers of the 1880s were Lisbon's studios of Augusto Bobone (1885–1910), also a painter, Muñiz & Martinez (1888–1900s) and Joaquim Fritz (ca.1888–91), Porto's studios of the Photographia Moderna of Leopoldo Cyrne & C.ª and latter of Ildefonso Correia & C.ª (1884–1900s), who edited the internationally upraised photographic magazine *A Arte Photographica* (1884–85), Peixoto & Irmão (1881–1900s) who practised a lot of processes, including carbon and photo-mechanical printing, introducing the woodburytype technique, Fulgêncio da Costa Guimarães (ca. 1883–94), Henrique António Guedes de Oliveira (1886–1900s), Coimbra's Adriano Gomes Tinoco (ca.1884–1910), Braga's Photographia Universal of A. Solas (1883–88), Viseu's Francisco Paino Perez (1884–87), a Spanish formerly established in Coimbra (1787–80) who also did itinerant work in the Beira and Alentejo provinces, Funchal's (Madeira island) Augusto Maria Camacho (1882–1900s), Manoel d'Olim Perestrello (1879 or 1888–1910s), Goa's (India) Souza & Paul (ca.1890s–1910). The amateur Adolpho Moniz photographed in Portuguese India (ca.1890). Qualified amateurs like Paulo Plantier (Lisbon, 1887), Joaquim Augusto de Sousa (Funchal, 1870–1905), Eduardo Alves (Porto, ca.1884–86), Antero Araújo (Porto, 1885–86), Margarida Relvas (1884–85), and Camilo dos Santos (1886–87, 1898–99) revealed technical maturity and aesthetical formation. Many of these, along with professionals and foreign photographers participated in the *Exposição Internacional de Photographia*, organized by Photographia Moderna and realized in 1886 in Porto's Crystal palace. Two years before, Álvaro Joaquim de Meirelles claimed the invention of a movement stereoscope, adapting two praxinoscopes to a stereoscope viewer. During this decade Emílio Biel & C.ª documented the newly built railroad lines of Beira Alta (1882), Douro (1883–84), Minho, and the construction of Porto's bridges of D. Maria Pia and D. Luís.

Between the most significant photographers in the 1890s were Lisbon's studios of Arnaldo da Fonseca (1891–ca.96) who published a photography treatise (1891), Vidal & Fonseca (1895–1914), and the reporters António Novaes (1896–1900-) and Joshua Benoliel (1898–1900-), Porto's José de Carvalho (1890–96), Braga's Francisco G. Marques (1893–1925), Póvoa de Varzim's Avelino Barros (1895–1900-), Viseu's Perez & Filhos (1880s–90s), Santarém's Manoel A. Silva Nogueira also established in Faro worked in Caldas da Rainha during thermal season and Nazaré during bath season, Évora's Ricardo dos Santos (1887–1900), Lourenço Marques (Moçambique)'s Louis Hily (ca.1894–1905) and the brothers J. and M. Lazarus (1899–1908). Manuel Goulart, originary from the Açores archipelago and established in New Bedford (U.S.A.), took a large stereoviews series entitled Azores, Madeira and Portugal (1897).

Some amateurs also emerged in this decade, like Aurélio da Paz dos Reis, who introduced cinema in Portugal (Porto, 1896), and did extensive stereoscopic work.

In the last decade of the century, and the early years of the 20th century, there was a significant growth in the number of photographic studios away from the major population centres, driven by population movement, and by a reduction in prices which brought photographic portraiture within the reach of all levels of society. At the same time, many more people became involved in amateur photography in Portugal, as was happening in other countries.

The first photoengravings made and published in Portugal appear for the first time in 1890s periodicals, made by Lisbon's studios of José Pires Marinho (1894), Castello Branco & Alabern (1895), and Porto's Marques de Abreu (1898).

From the 1840s until the end of the century, French and British photographic publications were available in bookshops in Lisbon, Porto, and Coimbra. 'The majority of photographic plates, cases, cards, albums, cameras, and other apparatus was imported and sold by specialist dealers in the major cities. Only two short-lived attempts to develop a Portugese manufacturing industry met with any success—in Lisbon, the factory of *A Portugueza* (1899) and the Porto factory of Pinheiro d'Aragäo & C.a.

Nuno Borges de Araujo

See also: Wet Collodion Negative; Calotype and Talbotype; Forrester, Baron Joseph James de; Itinerant Photographers; Relvas, Carlos; South Kensington Museums; Cartes-de-Visite; Albumen Print; Collotype; and Photogravure.

Further Reading

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POSITIVES: MINOR PROCESSES

During the first sixty years of photographic experimentation, a host of processes were devised for printing positives from camera negatives. Their proud inventors tended to confer idiosyncratic names on these innovations, adding to a bewildering list that obscures the commonalities of these nineteenth-century processes: many are just minor variations on well-established photochemical themes. To confer some structure on what would otherwise be a miscellany, the processes for making positive photographs are gathered here into five basic categories, according to the nature of the light-sensitive chemical: whether it is a salt of silver, iron, uranium, or chromium, or an entirely organic compound. The accompanying Table is intended as an alphabetical finding-aid by name, giving the inventor, date, category, and essential nature of each process.

Silver Halide Processes

The transformation of a silver halide (chloride, bromide, or iodide) into silver metal by the action of light has always provided the mainstream of photographic practice. The major 19th-century processes for making silver positives are described under the entries for Albumen, Bromide print, Daguerreotype, Gelatin silver print, Photogenic Drawing, Salted paper print, Tintype and Wet Collodion positives. This section outlines the other named silver processes, which found less widespread recognition. It may be assumed that the light-sensitive component was silver chloride and the image consisted of silver, except when stated otherwise, and that all the processes (with one exception) were therefore "negative-working," i.e., they inverted the tonal scale, making a positive from a negative, and vice versa. Many of these processes differ only in the organic binding agent which acted as the vehicle for the silver halide, or in the substrate upon which it was coated. Included here as photographic "positives" are those silver processes that actually furnished a negative image, which was then treated or mounted so that it appeared positive when viewed under reflected light, i.e., minor variations of the Ambrotype, Daguerreotype and Tintype processes. In the Table, this category of process is designated as "silver negative."

Aristotype was just an elegant proprietary name for a silver chloride printing-out paper, using either collodion (Johann Obernetter 1868), or gelatin (Paul Liesegang 1884) as the binder, rather than albumen. *Aristo-Platino* was a silver halide paper marketed by the American Aristotype Company (1894), which required toning–with gold, platinum, or both. *Platino-Matt* and *Platino-Bromide* papers also belied their names, being silver halide papers, with starched matt surfaces to mimic platinotype.The *Alabastrine* process was a variant of the Ambrotype invented by Frederick Scott Archer in 1851: an underexposed wet collodion negative on glass, presented as a cased object, was backed in the mount with black paper so that a positive image was seen by reflected light. Alabastrine had the added

feature that the silver image was bleached by mercuric chloride, converting it to silver chloride and mercurous chloride, so whitening the deposit in the highlights. The *Pannotype* of Wulff and Company (1853) is another variation on Ambrotype, backed by black waxed linen, or leather, rather than paper.

The *Hillotype* enjoys a notorious history: it was claimed in 1850 to be a natural colour version of the Daguerreotype, and the life of its inventor, Levi Hill, reads no less colourfully. Although denounced as fakes by jealous daguerreotypists of the day, there are specimens of original Hillotypes in the Smithsonian Institution. Hill's chemically bizarre procedure is complicated and dangerous, but was carefully replicated in 1985 by Joseph Boudreau, who succeeded in obtaining Hillotypes showing some vestiges of "natural colour."

The first *Direct positive* silver photographs were created in 1839 by Hippolyte Bayard, who used his unnamed positive-working process directly in the camera with considerable success. In 1840, Henry Talbot devised a similar "positive photogenic drawing paper" which he called *Leucotype*: an ordinary salted silver paper was heavily exposed and fixed, to provide a uniform, black ground of silver; treatment with strong potassium iodide solution rendered this layer susceptible to bleaching by light, which formed pale yellow silver iodide. Such photographs tend to fade in the light, and are very rare.

With their *Hyalotype* of 1849 the brothers Friedrich and Wilhelm Langenheim provided the earliest lantern slides as silver-albumen positive transparencies (diapositives) on glass, using the Niépceotype process of 1847 due to Claude Felix Abel Niépce de Saint Victor. Other variations bearing names suggestive of a glass substrate were: John Whipple**'s** *Crystalotype* of 1854, and the *Opalotype* publicised by P.C. Duchochois in 1865 using translucent opal glass. The *Crystoleum* process of 1880 involved glueing an albumen positive face down onto a concave glass surface, removing much of the backing, and colouring by hand in oils. Such manual embellishment featured in other named processes: Wilson**'**s *Sennotype* of 1864 was a hand-coloured albumen positive on glass; Urie's *Relievotype* of 1854 was a collodion positive on glass with the background scraped away, and re-backed with a painted card; it was introduced by Thomas Lawrence in 1857.

A wider range of substrates was made possible in 1888 by the Kodak Company's *Transferotype*, which was a "stripping emulsion" whereby the silver-gelatin image could be transferred onto glass or canvas, for example. Prints on genuine ivory are rare; *Ivorytype* (John Mayall 1855) and *Eburneum* prints (John Burgess 1865) were imitations on specially-whitened substitutes. To make satisfactory photographic images on enamels and ceramics which had to be fired at high temperatures under a glaze, the *Photoceramic process* due to Pierre Michel Lafon de Camarsac in 1855 used chemical toning to replace the silver by a more refractory noble metal, such as gold, platinum, or iridium. Other photoceramic techniques employed refractory pigments applied by the carbon process (see below).

Some silver sensitizers incorporated novel chemical constituents. Robert Hunt added succinic acid in his *Energiatype* process of 1844: a paper that could either be printed-out, or developed (with ferrous sulphate, causing Hunt to re-name this process "*Ferrotype*"—not to be confused with the alternative name for Tintype.) Jacob Wothly included uranium salts in a silver emulsion in his eponymous *Wothlytype* of 1864. Extravagant claims for this print-out process (sometimes misleadingly called Uranotype) attracted attention initially, but its virtues were soon discounted; it did however represent the first use of collodion as a binding agent.

Iron Carboxylate Processes

The "ferric" processes—collectively called 'siderotypes' by Sir John Herschel—are based upon light-sensitive salts of iron(III) with "vegetable acids" such as citric, tartaric and oxalic, which are polycarboxylic acids. The photochemistry is described under light-sensitive chemicals, and under Cyanotype and Platinum Print—the two major nineteenth-century iron-based printing processes. Besides these two, there were more than a dozen minor siderotype processes, both positive- and negative-working, which furnished images in a variety of substances.

Henri *Pellet's process* of 1877, called *Cyanofer* in France, produced Prussian blue prints, but differed from the simple cyanotype in being positive-working. A version of the sensitizer due to Giuseppe Pizzighelli and Ludwig von Itterheim contained a mixture of iron(III) chloride, tartaric acid, and gum Arabic: the gum was hardened by the iron(III) salt, but where light fell this was reduced to iron(II), allowing the gum to re-soften. A developer of potassium ferrocyanide formed Prussian blue in the insoluble, unexposed regions and, to fix the image, the Prussian white formed in the soluble, exposed regions was washed away. The Pellet process was reputed to be difficult to work satisfactorily—highlights were often blued—but it found some application for copying purposes, for instance reproducing maps for the Survey of India Office. Alphonse *Poitevin's process* of 1860 had a commonality with Pellet's: it was also positive-working, and relied on the ability of iron(III) chloride to harden a colloid, in this case gelatin carrying a pigment. In regions where the light caused reduction of iron(III) to iron(II), the gelatin re-softened, and was washed away in the development bath with its attendant pigment. Also based on cyanotype were John Mercer's

Chromatic photographs on textiles of the 1850s, but the Prussian blue images were alkali-bleached to iron(III) hydroxide, which then served as a mordant to bind vegetable dyestuffs.

The *Palladium print* is a close analogue of the platinum printing process, and came to be much-used from 1916, when its invention was credited to William Willis, whose Platinotype Company marketed a commercial *Palladiotype* paper. There is, however, evidence that prints in palladium were made and exhibited as early as 1856 by Charles Burnett of Edinburgh, as described below under uranium processes.

Several siderotype processes yielded an image of silver, by the iron(II) photoproduct reducing silver nitrate. This theme originated in 1842 with Sir John Herschel's *Argentotype*. His sensitized paper was coated with ammonium iron(III) citrate, and the development bath contained silver nitrate. In 1843 Herschel also devised his curious *Breath print* process, using a mixture of ferrotartaric acid and silver nitrate. No image was visible after exposure, but it sprang into existence as soon as the paper was breathed upon, because exhaled moisture promoted the development reaction. Towards the close of the nineteenth century, several derivatives of Herschel's argentotype appeared: variously dubbed *Brownprint* (patented by H. Shawcross in 1889), *Sepiatype* (Sharp and Hitchmough Company 1891), and *Vandyke* (Arndt and Troost 1895), they mixed ammonium iron(III) citrate with silver nitrate, adding tartaric acid to inhibit precipitation of silver citrate; images printed-out in shades of brown, were washed in water, and fixed in dilute sodium thiosulphate. A closely-related process, but employing iron(III) oxalate, was the *Kallitype*, so-named and patented by W.W.J. Nicol in 1889, 1890, and 1891, although this well-explored formulation had been anticipated as early as 1844 by Robert Hunt in an unnamed process. Kallitype needs an alkaline-buffered developer to avoid re-dissolving the silver image. Owing to difficulties in fixing and clearing, iron-based silver prints were generally prone to deterioration, and acquired a poor reputation for permanence. Despite wide publicity of these processes in the nineteenth-century photographic literature, surprisingly few historic specimens have been positively identified in present-day collections.

The most striking of Herschel's 1842 discoveries was *Chrysotype*, which provided deep purple images in nanoparticle gold (a pigment known to ceramicists as the Purple of Cassius). For chemical reasons, Herschel's procedure required the gold salt to be in a developing bath or wash; such profligacy inhibited his pursuit of the process, but a number (ca. 20) of his specimens have survived perfectly to the present. Later attempts to re-invent the gold process (Robert Hunt 1844, Alfred Jarman 1897) re-named it *Aurotype*. By the end of the nineteenth century, the employment of gold as a printing medium had been completely discounted, although it continued to be much used for toning silver images.

Between 1842 an 1844, Herschel was also striving to perfect an iron-based process providing an image in metallic mercury; he found indications that both negative- and positive-working versions might be possible. This may account for Talbot's suggestion of the name *Amphitype* for this process (not to be confused with the 1849 silver *Amphitype* of Blanquart-Evrard), replacing Herschel's original name of *Celanotype* (also spelt *Kelaenotype*). According to Herschel, his mercury photographs were the most exquisite imaginable. The process was doomed to failure, however, because mercury metal is volatile, and in the space of a few days or weeks such images simply evaporate. Specimens authenticated by Herschel's own annotations exist today as stained scraps of paper, without any discernable images.

It has long been known that iron(III) salts react with gallic or tannic acid to produce intense black pigments; iron-gall ink has been the chief writing medium since medieval times. Procedures for making photographic images in this substance devised by *Colas* (1883), Alphonse Poitevin (*Ferrogallic process* 1859), and *R. Nakahara* (1894), were all positive-working and chiefly used for copying line drawings and text, rather than continuous-tone pictorial purposes.

The *Dusting-on* or *Powder* process of Henri Garnier and Alphonse Salmon (1858) made use of the hygroscopic property of iron(III) citrate to remain tacky, especially in sensitizers containing sugar or honey; it only dries and hardens where exposed to light. A positive-working image could therefore be obtained by dusting over the exposed paper with a powdered pigment, which adhered selectively to the shadow areas.

Johann *Obernetter's ferrocupric* process of 1864 involved a roundabout chemical procedure to yield an image in the stable pigment, Hatchett's brown, copper(II) ferrocyanide. In Thomas *Phipson's* little-known process of 1861, ammonium iron(III) oxalate was the sensitizer; it was reduced by light to an iron(II) salt, which reduced potassium permanganate solution to the insoluble, brownish-black manganese dioxide.

Uranium processes

In this minor category, the oxidation-reduction chemistry is analogous to the previous iron case. Invented by Charles Burnett over 1855 to 1857, the uranium printing processes were capable of yielding images in stable substances, just like the siderotype processes. Under the action of light, and in the presence of organic matter, a uranium(VI) salt was reduced to uranium(IV), which in turn reduced a noble metal salt to the metal. By this means, Burnett made the first *palladium prints* in

1856, and obtained fine images in gold and silver. The uranium salts were washed out in the wet processing, so the finished *Uranium prints*, as they were inaccurately called, should contain no uranium, only the precious metal, and are therefore not radioactive. However, this is not true of Burnett's other uranium printing process of 1855, sometimes called *Uranotype*, as a close analogue of the Cyanotype: the uranium(IV) photoproduct reacted with potassium ferricyanide to yield uranyl ferrocyanide, a Bartolozzi-red pigment (also formed in the "uranium toning" of silver or platinum prints). Such photographs will be radioactive. In 1858, Niépce de Saint Victor also published, and sought patent rights for uranium printing processes essentially identical to those published by Burnett a year earlier. Unsurprisingly, this gave rise to some highly acrimonious exchanges in the photographic periodicals of the day.

Dichromate Processes

The orange-coloured, water-soluble dichromates of sodium, potassium, and ammonium were called "bichromates" in the nineteenth century—a nomenclature now disapproved as chemically misleading, but which persists in photohistorical usages. Under the action of light, dichromates are reduced by organic matter to chromium(III) salts, which have the ability to harden organic colloids, such as gum or gelatin, as explained under light-sensitive chemicals. If a pigment is incorporated in the sensitized layer, it will be retained where light has fallen and rendered the colloid layer insoluble, but may be washed off the paper where the colloid remains soluble—in the unexposed regions—thus providing a negative-working photographic process.

The major nineteenth century dichromate processes may be distinguished by the colloid: Carbon printing uses gelatin, Gum Bichromate employs gum Arabic (gum Acacia), but in the Fresson process the identity of the colloid still remains a proprietary secret. Dichromate processes are also of great importance in the preparation of plates for photomechanical printing processes.

Mungo Ponton was the discoverer of light-sensitivity in dichromated paper in 1839; he noted that exposure caused a colour change from yellow to brown, and the former could be washed out, leaving a negative-working image in white on greenish-brown. Henry Talbot experimented with dichromated gelatin in 1852 with a view to using it for photomechanical printing, but Alphonse Poitevin is generally acknowledged as the major promoter of the photographic pigment printing processes in 1855. *John Pouncy* obtained a patent for the gum process in 1858. Some named minor variations on the major dichromate processes will now be outlined.

The direct carbon process of 1878 due to Frédéric *Artigue*, also known as *Charbon-Velours*, was improved by his son, Victor in 1893, and was the forerunner of the Fresson process; the image was developed by a mildly abrasive suspension of sawdust in water. *Autotype* was the name adopted by the Autotype Fine Art Company, set up in the 1870s, for its carbon transfer tissues, marketed in a variety of pigment colours. *Lambert-type* (1875) was a carbon transfer from the surface of collodionised glass, so produced a print surface of notable brilliance. The *Photo-aquatint* was a re-naming of the gum bichromate process in 1894, when it was popularised by the skilled exponents, Alfred Maskell, Robert Demachy, and Alain Rouillé-Ladevèse.

Dusting-on or *Powder processes* are also possible with dichromated colloids. In preference to iron salts, Garnier and Salmon turned to dichromated gum and sugar in 1859, relying on this hygroscopic colloid to remain 'tacky' in the absence of light. Pigment was dusted onto the exposed surface, as described before, to yield a positive-working image. It is alleged that the funerary ashes of cremated loved-ones could thus be used to constitute their own portraits! Alessandro Sobacchi's *Anthracotype* of 1879 was also a dust-on process, using graphite powder as the pigment. There is also an *Ink* processes in hardened dichromated colloids due to G.W. Perry in 1856 or V.J. *Sella's process* of 1857. Thomas Manly's *Ozotype* of 1898 included manganese(II) salts in the dichromate sensitizer, and essentially produced hardening of a separate gelatin layer by diffusion transfer. Manly's *Gum ozotype* of 1899 was the analogue using gum Arabic.

A few dichromate processes differ from those above in not entailing colloid-hardening. The *Aniline process* of William Willis senior (1864) relied on the residual dichromate, after exposure, to exert a powerful oxidising action on aniline vapour, producing in the unexposed areas intensely coloured "aniline dyes" of the mauveine type. It enjoyed some importance as an early positive-working reprographic process for plans.

The *Chromatype* process of Robert Hunt (1843) had several manifestations: he added copper(II) sulphate to the potassium dichromate to improve its sensitivity; the image substance formed by development was an insoluble chromate of a heavy metal such as silver, mercury or lead, which are all highly coloured—orange and red. This process is positive-working, commonly producing a yellow image on an intense red ground of silver chromate, and, because dichromate solutions tend to penetrate paper, the image is usually clearly visible on the verso. Hunt also employed gold chloride to develop a *Gold chromatype* in which the final image was deep violet nanoparticle gold. Burnett's little-known dichromate-based *Cuprotype* of 1857 resembles Hunt's chromatype in its sensitizer, but the image substance formed was Hatchett's brown, copper(II) ferrocyanide, as in *Obernetter's process*.

Alphabetical List of 19th Century Photographic Processes for Making Positives

Process	Inventor	Year	Category	Image	Binder & substrate
Alabastrine	Scott-Archer	1851	Silver negative	Silver chloride	Collodion on glass with black backing
Albumen	Blanquart-Evrard	1850	Silver	Silver	Albumen on paper
Ambrotype	Scott-Archer and Fry	1851	Silver negative	Silver	Collodion on glass with black backing
Amphitype also Celanotype	Herschel	1844	Iron	Mercury	Paper
Amphitype	Blanquart-Evrard	1849	Silver negative	Silver	Albumen on glass with black backing
Aniline	Willis senior	1864	Chromium	Aniline dyes	Copying on paper
Anthotype also Phytotype	Herschel	1839	Organic	Flower colouring	Paper
Anthracotype see **Carbon**	Sobacchi	1879	Chromium	Carbon and pigments	Dusted on moist gelatin
Argentotype	Herschel	1842	Iron	Silver	Paper
Aristo-Platino	Aristotype Co.	1894	Silver	Silver + gold + platinum	Paper. Toned
Aristotype see **Collodion**	Obernetter Liesegang	1868 1884	Silver Silver	Silver Silver	Collodion print-out Gelatin print-out
Artigue	Artigue	1878	Chromium	Pigment	Colloid on paper
Asphalt also Heliographic, Bitumen and Niépceotype	Niépce	1822	Organic	Bitumen of Judaea	Silver, tin, or pewter plate
Aurotype see Chrysotype	Hunt Jarman	1844 1897	Silver Iron	Gold, silver Gold	Paper
Autotype also **Carbon**	Autotype Company	1870	Chromium	Pigment	Gelatin double transfer on paper
Bayard process see Direct Positive	Bayard	1839	Silver	Silver	Paper
Bitumen also Heliographic	Niépce	1822	Organic	Bitumen of Judaea	Silver, tin, or pewter plate
Blueprint also **Cyanotype**	Herschel	1842	Iron	Prussian blue	Paper or textiles
Breath print	Herschel	1843	Iron	Silver	Paper
Bromide print see Gelatin silver bromide	Mawdsley Swan	1874 1879	Silver	Silver	Gelatin on paper
Brownprint see Vandyke	Shawcross	1889	Iron	Silver	Paper
Carbon	Poitevin	1855	Chromium	Pigment	Gelatin on paper
Carbon transfer	Fargier Swan	1860 1864	Chromium	Pigment	Gelatin transfer onto paper Double transfer
Celanotype also Kelaenotype	Herschel	1842	Iron	Mercury	Paper
Celloidin process see Collodion	Kurtz	1889	Silver	Silver	Collodion on paper
Charbon Velours	Artigue	1892	Chromium	Pigment	Colloid on paper
Chlorobromide print	Eder	1883	Silver	Silver	Gelatin on paper
Chromatic photograph	Mercer	1858	Iron	Vegetable dyestuffs	Textiles or paper
Chromatype	Hunt	1843	Chromium	Silver chromate	Paper
Chrysotype	Herschel	1842	Iron	Gold	Paper
Colas see Ferrogallic	Colas	1859	Iron	Iron gallate ink	Copying on paper

Process	Inventor	Year	Category	Image	Binder & substrate
Collodion	Simpson	1865	Silver	Silver	Collodion on paper
Crystalotype see Hyalotype	Whipple	1854	Silver	Silver	Albumen on glass Lantern slides
Crystoleum		1880	Silver	Silver and oil pigments	Albumen on glass Hand-painted in oil
Cuprotype	Burnett	1857	Chromium	Cupric ferrocyanide	Paper
Cyanofer also Pellet process	Pellet	1877	Iron	Prussian blue	Paper
Cyanotype	Herschel	1842	Iron	Prussian blue	Paper or textiles
Daguerreotype	Daguerre	1837	Silver negative	Silver Amalgam	Silvered copper plate
Diazotype see Feertype	Feer	1889	Organic	Azo-dyes	Paper or textiles
(Direct positive) see Leucotype	Bayard	1839	Silver	Silver	Paper
Dust-on see Powder process	Garnier and Salmon	1858 1859	Iron Chromium	Pigment	Sugar, honey, and gum on ceramics
Eburneum see Ivorytype	Burgess	1865	Silver or Chromium	Silver or Pigment	Collodion transfer on white backing
Energiatype	Hunt	1844	Silver	Silver	Gum on paper
Feertype	Feer	1889	Organic	Azo dyes	Paper or textiles
Ferrogallic see Colas	Poitevin	1859	Iron	Iron gallate ink	Gum or gelatin Copying on paper
Ferro-prussiate see **Cyanotype**	Marion and Company	1872	Iron	Prussian blue	Paper
Ferrotype see **Tintype**	Smith	1856	Silver negative	Silver	Collodion on black lacquered tinplate
Fresson process	Fresson	1899	Chromium	Pigment	Colloid on paper
Gelatin silver bromide see Bromide print	Mawdsley	1874	Silver	Silver	Gelatin on paper Development
Gelatin silver chloride see Printing-out paper (P.O.P.)	Abney	1882	Silver	Silver	Gelatin on paper Print-out
Gold Chromatype	Hunt	1843	Chromium	Gold	Paper
Gum Bichromate	Poitevin Pouncy	1855 1858	Chromium	Pigment	Gum arabic on paper
Gum Ozotype	Manly	1899	Chromium	Pigment	Gum on paper
Heliographic also Asphalt	Niépce	1822	Organic	Bitumen of Judaea	Silver, tin, or pewter plate
Hillotype	Hill	1850	Silver	Silver and other metals	Silver plated copper sheet
Hyalotype	Langenheim Brothers	1850	Silver	Silver	Albumen on glass Lantern slides
Ink Process see Sella's Ink	Perry	1856	Chromium	Iron gallate ink	Gelatin on paper
Ivorytype see Eburneum	Mayal	1855	Silver	Silver	Hand-coloured, waxed and backed
(Iron Oxalate) Kallitype	Hunt Nicol	1844 1889	Iron	Silver	Paper
Kelaenotype also Celanotype	Herschel	1842	Iron	Mercury	Paper
Lambert-type see **Carbon**	Lambert	1875	Chromium	Pigment	Stripped from collodionized glass

(*Continued*)

Alphabetical List of 19th Century Photographic Processes for Making Positives (Continued)

Process	Inventor	Year	Category	Image	Binder & substrate
Leucotype see Direct positive	Talbot	1840	Silver	Silver	Paper
Melainotype also **Tintype**	Martin	1853	Silver negative	Silver	Collodion on black lacquered tinplate
Nakahara see Colas	Nakahara	1894	Iron	Iron tannate ink	Copying on paper
Obernetter's ferrocupric	Obernetter	1864	Iron	Cupric ferrocyanide	Paper
Opalotype	Duchochois	1865	Silver Chromium	Silver Pigment	Opal glass plate
Ozotype see **Carbon**	Manly	1898	Chromium manganese	Pigment	Diffusion transfer hardening gelatin
Palladium print Palladiotype	Burnett Willis junior	1856 1916	Uranium Iron	Palladium Palladium	Paper Paper
Pannotype	Wulff and Company	1853	Silver negative	Silver	Collodion on black waxed linen
Pellet print	Pellet	1877	Iron	Prussian blue	Gum on paper
Phipson's process	Phipson	1861	Iron	Manganese dioxide	Paper
Photo-aquatint see *Gum bichromate*	Rouillé-Ladevèse, Maskell and Demachy	1894	Chromium	Pigment	Gum Arabic on paper
Photoceramic	Camarsac	1855	Silver	Platinum- or Gold-toned	Vitrified on enamel and porcelain
Photogenic drawing	Talbot	1834	Silver	Silver	Paper
Physautotype	Niépce and Daguerre	1830	Organic	Colophony resin	Glass or silvered copper plate
Phytotype also Anthotype	Herschel	1840	Organic	Flower colouring	Paper
Pizzighelli's see Platinum print	Pizzighelli	1887	Iron	Platinum	Print-out on paper
Platino-Matt & Platino-bromide	Imperial Co. Barnet Co.	1900	Silver	Silver	Paper matt surface
Platinotype or **Platinum print**	Willis	1873	Iron	Platinum	Paper
Poitevin's process	Poitevin	1860	Iron	Pigment	Gelatin on paper or ceramics
Ponton's process	Ponton	1839	Chromium	Chromium oxides	Paper
Powder process see Dust-on	Garnier and Salmon	1858 1859	Iron Chromium	Pigment Pigment	Sugar, honey, and gum on ceramics
Primuline process see Diazotype	Green, Cross, and Bevan	1890	Organic	Azo dyes	Paper and textiles
Printing-out Paper see **Gelatin Silver Chloride**	Ilford Company	1891	Silver	Silver	Print-out on paper
Relievotype	Urie	1854	Silver	Silver	Collodion on glass painted background
Salted paper print	Talbot	1839	Silver	Silver	Paper
Sella's ink process see Ink process	Sella	1857	Chromium	Iron-gall ink	Paper
Sennotype	Wilson	1864	Silver	Silver	Albumen on glass hand-coloured
Sepia platinotype see **Platinotype**	Willis jnr	1878	Iron	Platinum and Mercury	Paper
Sepiatype see Vandyke	Sharp and Hitchmough	1891	Iron	Silver	Copying on paper

Process	Inventor	Year	Category	Image	Binder & substrate
Tintype also Ferrotype	Martin	1853	Silver negative	Silver	Collodion on black lacquered tinplate
Transferotype	Kodak Company	1888	Silver	Silver	Gelatin transfer to glass or canvas
Uranium print	Burnett Niépce de Saint Victor	1857 1858	Uranium	Gold or Silver	Paper
Uranotype	Burnett	1855	Uranium	Uranyl ferrocyanide	Paper
Vanadium print	Endeman	1866	Vanadium	Aniline dye	Paper
Vandyke see Argentotype	Shawcross Arndt and Troost	1889 1894	Iron	Silver	Paper
Wothlytype	Wothly	1864	Silver and Uranium	Silver	Collodion on paper

Organic Processes

This category is rather diverse in the materials it embraces, but all are purely organic, some macromolecular or colloidal, and do not involve inorganic salts. The photochemistry is not well-understood in all cases, but entails colloid-hardening and dye-bleaching processes.

The oldest organic process was also the first to provide a camera image that has survived to the present day: the *Heliographic* process invented by Joseph Nicéphore Niépce around 1822, also known as the *Asphalt* or *Bitumen* process. Bitumen of Judaea dissolved in oil of lavender was thinly coated onto a metal plate or stone; the layer hardened selectively in the light, and was developed by the same solvent. Niépce employed it mostly as a photoresist to make lithographic plates for the photomechanical copying of engravings. But upon a shiny metal plate (tin, pewter, or silver-plated copper) a degree of tonal reversal gave an apparently positive image, which could be enhanced by iodination. Such a camera photograph by Niépce, dating from 1827, is in the Gernsheim Collection of the University of Texas. A point of terminology deserves clarifying here: although the very first photographic process was named "héliographie" by Niépce, later in the 19th century the word "heliography" came to be widely used for all "sun-printing," moreover "heliographic processes" included those intended specifically for reprographic copying purposes, that is for line, rather than continuous tone, images.

The *Physautotype* process due to Nicéphore Niépce and Louis Daguerre (ca. 1830) was rediscovered only recently (ca. 1995) by Jean-Louis Marignier: exposure to light of colophony resin (abietic acid) can cause its insolubilization, even without the presence of metallic salts. The image on glass or shiny metal is developed by washing, and has a subtle character when viewed by transmitted light: its visibility depends on selective optical scattering, rather than absorption, of the light.

The *Anthotype* or *Phytotype* process, first devised by Herschel in 1839, simply entailed the bleaching by sunlight of fugitive flower colorants (now known to chemistry as anthocyanins). Herschel found most success with yellow japonica, red poppy, common heartsease, double ten week stock, harlequin flowers, and purple groundsel; he crushed the flower petals to pulp, extracted the expressed juices with alcohol, and filtered the solutions for dyeing the paper. To bleach the dye under an engraving, giving a positive image, required exposures to bright sun ranging from an hour or two for the most sensitive dyes, to several weeks for the least. By dispersing sunlight with a prism, Herschel performed spectrographic analyses of the responses, which showed that a given dye was most effectively destroyed by light of its complementary colour. Herschel believed this positive-working process had potential for a system of direct full-colour photography, but could find no method of fixation, as the pictures inevitably faded in the light.

Monochrome images were later obtained by the more sensitive *Diazotype* or *Feertype* (Adolf Feer 1889), and *Primuline* (A.G. Green, C.F. Cross, and E.J. Bevan 1890) processes, which depended on the decomposition of diazonium salts by light. The remaining unchanged salt—which is highly reactive—was then allowed to couple with an organic compound included in the developer to yield an azo dye, so providing a positive-working reprographic process in a variety of colours, determined by the choice of the coupling agent.

MIKE WARE

See also: Light-Sensitive Chemicals; Albumen Print; Bromide Print; Daguerreotype; Gelatin Silver Print; Photogenic Drawing Negative; Salted Paper Print; Tintype (Ferrotype, Melainotype); Wet Collodion Positive Processes; Liesegang, Paul Eduard; Archer, Frederick Scott; Cased Objects; Hill, Reverend Levi L.; Smithsonian Institution; Bayard, Hippolyte; Talbot, William Henry Fox; Langenheim, Friedrich and Wilhelm; Lantern Slides; Niépce de Saint-Victor, Claude Félix Abel; Whipple, John Adams; Coloring by Hand; Kodak; Hunt, Robert; Wothly, Jacob;

Cyanotype; Platinum Print; Platinotype Co. (Willis & Clements); Burnett, Charles John; Herschel, Sir John Frederick William; Toning; Poitevin, Alphonse Louis; Carbon Print; Fresson Process; Autotype Fine Art Company; Demachy, (Léon) Robert; and Niépce, Joseph Nicéphore.

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POSTCARD

A postcard is a 3½ × 5½" stiff card with a printed image on its face (recto) and room for an address, message, and postage on its back (verso).

The postcard, however ubiquitous in the twenty-first century, is a quintessential product of the nineteenth century, embodying many of the characteristics of the age in which it was born and developed. On one hand, the postcard was a means of rapid, brief communications in an increasing busy age. Gladstone, for example, wrote much of his voluminous daily correspondence on plain halfpenny postcards. On the other hand, the craze for sending and collecting picture postcards epitomized the Victorian mania for acquiring, classifying, and arranging specimens.

The postcard's visual antecedents include eighteenth-century pictorial visiting cards and trade cards, nineteenth-century pictorial writing paper and envelopes, and cartes-de-viste, the collecting craze of the 1860s. The development of the postcard's physical format is directly linked to nineteenth-century postal regulations imposed by both individual countries and the International Postal Union. In the early nineteenth century, mail rates were based on the number of sheets in a letter (including the envelope), and the distance it was to travel. In 1840 the British Post Office instituted the penny post, establishing a flat rate of one penny per half ounce. Letter writing became affordable for a greater part of the population. As people became dependent on corresponding by post for both personal and commercial use, they sought ways to exchange messages more rapidly and economically.

In 1865 Dr. Heinrich von Stephan, a German post office official, proposed an "offenes Postblatt" or open post sheet, at the Austro-German postal Conference. He described a printed, postage-paid card with one side for the address and the other for the message, which could provide the user with a certain ease and convenience not associated with paper-and-envelope letters. Although von Stephan's idea was not adopted by the Germanic postal service, the idea of open-sheet letters, sent at printed material or penny post rates was adopted by some people throughout Britain, Europe, and North America, especially for business matters. In fact, the earliest postcard is generally acknowledged to be Lipman's Postal Card, a plain card published in Philadelphia in 1861 (patent applied for by John P. Charlton).

The idea of a postcard continued to gain currency throughout the 1860s, culminating with a suggestion by Dr. Emanuel Herrmann, an Austrian professor of economics, for a "Correspondenz-Karte" to be printed by the post office on a "thin buff-colored slice of cardboard." Similar to von Stephan's idea, Herrmann saw his card as a solution for sending a brief message by post. Later that year the Austrian post office produced what is considered to be the first official postcard. On its face of was printed the Austrian emblem with "Correspondenz-Karte" above it, a two kreuzer stamp in the top right-hand corner, and three ruled lines in the center for the address. It was immediately popular—2, 936,102 cards were sold in first three months.

The first official German, English, and Swiss postcards debuted the following year, and the first U.S. postcards were printed in 1873. The standard postcard size was 4 ¾ × 3 1/3 or 4 ¾ ×3 inches (4 ½ × 3 ½" for the British size). In the first year of their use 75 million halfpenny cards were posted in Britain alone. By 1903

the number of postcards sent in Britain was almost ten times that amount.

Although entrepreneurs quickly recognized the possibility of producing cards embellished with borders, advertisements, and pictures, governments continued to regulate and monopolize postcards. Privately printed postcards could be sent through the post, but at the standard, rather than reduced, rate. In general, there were fewer postal regulations on the continent than in Britain and the United States, so countries such as Germany, Switzerland, and Austria led the way in the evolution from the plain postcard to the picture postcard. Various people are claimed to have produced the first picture postcards. The two most often agreed upon are Leon Bésnardeau and A. Schwartz, both of whose cards appeared in 1870, inspired by the Franco-Prussian war. An Austrian postcard printed by A. Schwartz of Oldenburg, showing a soldier and cannon in upper left-hand corner, is considered to be the earliest government-issued pictorial postcard. In France Leon Bésnardeau, a stationer in Sillé-le-Guillaume, printed a card for the Breton troops showing stacked weapons and an empty battlefield surrounding the address area.

In 1870 English firms began to print pictorial advertisements on post office halfpenny cards, but these were not considered to be official cards, nor were they picture cards in the purest sense. In 1872 private printers in many countries won the right to print cards provided they had official postage printed on them. German, Swiss, and Italian publishers all printed early view cards; in Nuremberg J.H. Locher of Zurich printed a series of views of his city which may have been the earliest view cards issued. Although the printers had won a victory for cards with pictures, the use of such cards was still strongly tied to commerce. Single-color small views of cities and attractions such as spas and restaurants were printed on cards more to attract business to these venues than for the sake of producing an attractive card that would be purchased and sent for its intrinsic value.

In 1875 the First Congress and International Postal Treaty established a fixed rate for letters sent to all member countries of the union. Postcards could now be sent abroad between member countries at half the letter rate. However, at this time the address and postage were still placed on the front of the cards, which constrained the size of the image. It gradually it became the practice to reserve one side for the address, with no other writing allowed on it, and the other side for the picture and stamp. The choice was between having a front with smaller pictures and space for writing, or a picture covering the entire face, so that if the sender wished to include a message it could only be written over the image. The divided-back postcard, which solved the problem of providing space for the message, address, and postage all on one side of the card, leaving the other side completely free for the image, did not come into being until 1902, when it was adopted by Great Britian, with other countries quick to follow suit.

Although instantaneous photography was readily available by the time the first postcards appeared, real photographs were not used as postcards until almost the turn of the twentieth century. Instead, photographs formed the basis from which the image was reproduced. By the 1890s single-color picture postcards had given way to full-color cards reproduced from photographs by means of collotype, chromolithography, photogravure, or half-tone photo engraving. The photograph was seen only as the basis for the card. Even when it recorded an event, the photograph was thought of solely as the intermediary from which half-tone blocks could be made and printed. Thematic cards such as those made popular by Bamforth and others were carefully posed and arranged and views were carefully framed. Such cards were advertised as being based on "real life photos."

The potential of the real-photo postcard was realized late in the century when established photographers began to capitalize on their existing stock of images and expertise. While some well-known photographers scoffed at the picture postcard medium, others such as William Jackson in the United States, and Francis Frith and Valentine and Sons in England, recognized the potential for both making and publishing photographic postcards. Soon other photographers began selling negatives to picture postcard companies.

The real–photo postcard was given a boost just before the turn of the century when George Eastman introduced lightweight, hand-held cameras pre-loaded with 100-exposure rolls of film. Advertised by the slogan "You press the button, we do the rest," the entire camera was returned to Kodak for developing. One could receive either small prints or sepia-colored real photo postcards.

Starting in 1902 Kodak offered a pre-printed card back for printing negatives as postcards. Many itinerate photographers used postcard stock, and they and other professional photographers could have their name or logo printed on it. Glass plates and sheet film were also available in postcard size. The following year the #3A Folding Pocket Kodak was introduced which took postcard-sized photographs on roll film. It included a waist-level viewfinder that could be rotated 90 degrees, allowing the user to take horizontal as well as vertical pictures. Postcard format cameras were soon produced by other manufacturers. Made by amateurs and "professionals" alike, the age of the gelatin silver snapshot photograph had begun, lasting well into the first half of the twentieth century.

Beth Ann Guynn

See also: Collotype; Frith, Francis; Valentine, James and Sons; Eastman, George; and Kodak.

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POSTMORTEM PHOTOGRAPHY

Postmortem photography has its roots in a long tradition of posthumous memorial and funerary portraiture. These costly portraits were mainly of wealthy persons or well-known figures who were usually depicted as if still living. Visual clues within the painting signaled that it was a post mortem portrait. These portraits were intended to create the illusion of life in death. Although usually for the private consumption of the family of the deceased, they sometimes had a more public, commemorative purpose.

The first postmortem daguerreotypes were made in 1841, only two years after the daguerreotype was introduced. For the first time, photography made postmortem portraits relatively accessible for all who wanted them. At the apex of the Victorian obsession with death, postmortem photographs became a popular accoutrement of the rituals of death and mourning. The realm of posthumous portraiture shifted from a strictly upper class practice to a middle and lower class one. By 1850 almost any family that desired an image of their dearly departed could afford the cost of approximately 25 cents for a daguerreotype.

This phenomenon is another instance of how early photography was quickly put into the service of an existing or perceived daily need. By the mid-nineteenth century the preoccupation with death had taken a firm hold on both sides of the Atlantic. Death was seen as the ultimate act of nature, in both romantic and realistic terms. Due to the high mortality rates of the nineteenth century, especially among infants and children, death was perceived as God's will, beyond all human control. Ever-present and inevitable, death was an accepted familiar. Because death usually occurred at home, the experience of death was shared by all family members, as a event to be recorded and remembered. The death of a loved one signaled the completion of relationships, the closing of the circles of family and life. In some sense, the visual manifestations of mourning, and perhaps postmortem photographs most of all, were the links that served as both the aperture and closure of the circle.

Postmortem photography served several purposes. It was a way to console the bereaved, to share the image and details of the death of a loved one with those who had not been there, and to memorialize the deceased. A photograph created a tangible object that represented the deceased. This became especially important when the posthumous image was the only existing likeness of the individual. Postmortem photographs were kept on parlor tables and mantels and in family albums. They were also sent to far away relatives along with written accounts of the death. In all aspects postmortem photographs were literally "memento mori." Elizabeth Barrett wrote of a postmortem daguerreotype in her possession, "It is not merely the likeness which is precious—but the association and the sense of nearness involved in the thing…the fact of the very shadow of the person lying there forever!…I would rather have such a memorial of one I dearly loved, than the noblest artist's work ever produced" (Gernsheim and Gernshiem, *History of Photography*, 64).

Early on some miniaturists and other artists turned to photography, recognizing it as both a faster way to record the deceased and as a way to increase their business. Conventions from the posthumous painting tradition such as the inclusion of watches and clocks or bottles of medicine are often found in early photographs. Photographers did not hesitate to advertise their services. "Secure the shadow 'ere the substance fade" was a popular early advertising slogan for daguerreotypists. In an era when photographic portraiture was still not considered a matter of course and many of the living had never had a photographic portrait taken, it called out to the increased importance being placed on portraiture, whether living or posthumous, as a method of remembrance. Nathan Burgess concluded his 1855 article "Taking portraits after death" with these words: "How true it is, that it is too late to catch the living form and face of our dear friends and will illustrate the necessity of procuring those more than life-like remembrances of our friends, ere it is too late—ere the hand of death has snatched away those we prize so dearly on earth" (*The Photographic and Fine Art Journal,* 8:80). This practicality of this statement lies in the fact that before

Aubert, Francois. Corpse of Emperor Maximillian.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

embalming became prevalent photographs had to be taken quickly while the body was on ice. The deceased were often buried on the same day they died. Thus the deceased was often rushed to the photographer's studio or the photographer often came to the home on short notice.

The intimacy of early postmortem images is striking. They often show in death that which would not have been shown in life. Images that we would consider very private—a wife mourning a husband at his death bed; women and girls in white burial gowns, meant to represent confirmation or wedding dresses, yet bearing a close resemblance to nightgowns; the overt portrayal of grief rather than stoic acceptance; even the canonized poses of grief which seem so staged and histrionic to contemporary viewers—were readily viewed and widely. The admittance of the photographer to a very private space shows the status of the photographer, along with the doctor and clergyman, as an important character in the final act of death. It bears repeating that throughout the 19th century grief was an acceptable public emotion, widowhood was seen as a lifelong female role, and the discussion of death and the deceased was considered a polite topic of conversation.

Unlike conventional portrait photography, in postmortem photography long exposure times were possible without discomfiting the sitter. The problems often encountered with blurring were not an issue, resulting in images that were crisper and of an often higher quality, than those of live subjects. The need to remain still during long exposures often created a lack of facial expression in images of the living, grieving relatives. Their grief was most often expressed through the conventional symbolism of their poses. This creates the dichotomy wherein portraits of the deceased seem to have a more expressive, relaxed demeanor than those of the living. Articles in photographic trade journals described techniques for photographing the dead including lighting and positioning the body, practical advise such as having relatives leave the room "should they witness some little mishap likely to befall the occasion" and how to open the eyes of the deceased with a spoon.

The earliest postmortem photographs were the simplest. In the daguerreotypes, ambrotypes, and other plate images of the 1840s and 50s the deceased was portrayed close-up and alone, with few, if any, accoutrements. Little attempt was made to soften the effects of death. With the exception of the "sleeping" child, the fact of death was quite obvious. Many images were taken exactly where the deceased had expired, without arranging the body. Often parents are shown holding a child in their laps, as if it is still alive, or holding it up for. Frequently the subject, usually a child, is placed across a studio chair or couch in a pose representing "the last sleep." Some images of this type depict the child in its bed, often in a christening outfit. "The last sleep" was the dominant theme of postmortem photography from 1840–1880. The close-up, "sleeping" image conveyed the ancient symbolism of death as sleep or a rest from one's labors. This convention can also be seen as the denial of death. It is often difficult to tell, especially in images of the very young, if the subject is living or deceased.

Sometimes the subject is seated upright on a chair or couch with its hands crossed in its lap and the eyes closed. The seated pose seems also to be an attempt to portray the subject as alive, although death is more evident than in the 'last sleep" convention. This pose was especially favored when no living portrait had been taken or when the family was considering having a posthumous portrait.

The inclusion of favorite items of the deceased in the image is concept taken from the posthumous portraiture tradition. Children were often depicted holding a small doll or favorite toy. Scattered toys (often studio props), abandoned in the moment of play symbolized the deceased's departure. Another subject favored for infants was the "from carriage to coffin" convention depicting the infant laid in a baby carriage with its small coffin present in the background shadows.

Sometimes multiple images were taken of the deceased: alone, with a parent or spouse, at the gravesite, and so on. Since daguerreotypes were unique images, this was one way of creating more than one image. Such images also recorded the different aspects death and mourning and the specific events and feelings associated with them.

Special black mourning cases embossed with funerary designs were made for postmortem daguerreotypes. If no postmortem photograph had been taken a photograph of the person while alive was sometimes put in a mourning case. Funeral notices, poems, letters, and other small remembrances were often kept in the case. As the century progressed photographs were included in mourning lockets and rings and all sorts of other memorial photographic paraphernalia was invented. In 1851 a U.S. patent for a special case to imbed daguerreotypes in tombstones was granted.

In the 1860s with the advent of albumen prints and the invention of the popular carte-de-visite, multiple prints of the postmortem photograph became possible. This facilitated the dissemination of images to relatives in distant locations, often accompanied by a letter describing the death, funeral, and mourning practices being observed. At this time images start to depict simple surroundings and tend to show the subject "at peace" with the hands crossed over the body.

In the mid-19th century the illustrated press such as the Illustrated London News and Harper's Weekly routinely published images of death, particularly images from war or gruesome accidents. In 1863 Matthew Brady began to produce images of the civil war dead that were sold to a popular audience in the form of stereographic cards. Images of death became a type of collectible news item. While this topic deserves further exploration elsewhere, for the purposes of this article it is worth noting that such wide acceptance of death as news image probably would not have been as easily accepted by the public were it not for the already widespread production of postmortem photographs for private use.

By the 1870s stereographs become a popular format for postmortem images. The stereograph's popularity was soon eclipsed by the larger format cabinet card, which afforded greater freedom in the posing, lighting and background of the postmortem portrait. The cabinet card remained popular through the turn of the century. In the larger format images of the dead became more staged and an interest in the beautification of the deceased surfaced for the first time. Rather than recording the raw facts of death, or denying death, flattering poses and the increased inclusion of symbolic accoutrements pointed out the transience of life. A stopped clock signaled the moment a life had ended; a rose held downward held indicated that the child depicted was indeed dead; the head and body resting on pillows stood for eternal sleep and a closed book symbolized a closed life. Flowers were also placed around the body. Flower arrangements in symbolic shapes such as crosses became popular. Personal effects, especially for children, were increasingly included and elements of the photograph were often hand-tinted.

In the 1880s the practice of embalming the deceased became more common, allowing more time to beautify the corpse and to set up elaborate poses and scenes. Casket photographs become more popular as the more luxurious and comfortable looking cloth-lined casket replaced the narrow wooden coffin heretofore in common use. Sometimes the image of the deceased was superimposed into the center of a stock background of flowers and wreathes, creating a lush, abundant setting foretelling the deceased's final destination in paradise. From 1885–1910 this increased emphasis on placing the deceased in the coffin within a larger funeral "scene" became more popular, especially for adults.

Beginning in the early 1880s black mourning cards were frequently distributed to mourners. The simplest contained only the name of the deceased. The most elaborate contained a poem from the vast stock of funeral literature that had been written over the course of the century, as well as a photograph of the deceased. This sideline to the practice of postmortem photography continued through the early decades of the 20th century. It is but one example of the numerous businesses that grew up around the high Victorian preoccupation with death and contributed to the outcry by numerous late Victorian social critics against the commercialization of death.

In the late 19th century death and the responsibilities associated with it increasingly moved from the home and family to institutions. The death of the sick occurred more often at the hospital, the body was prepared by professionals at the funeral parlor rather than by the family, and the wake was held there instead of at the home. The formal room in the family home known as the parlor where important visitors were received and viewings and wakes were held began its transformation into the modern living room as the funeral parlor replaced many of its previous functions. Postmortem photography taken at the funeral home emphasized the social aspect of the funeral, both as a family gathering and as the last record of the deceased as a tangible member of the family circle. The funeral director often took on the role of postmortem photographer, a service that he could discreetly offer the family.

As funeral rites and practices changed, some aspects of death became more private and many of the visible trappings of mourning began to disappear. The practice of photographing the deceased became more private, as evidenced by the fact that photographers no longer openly advertised their postmortem services.

The postmortem image seems have been made more for the private consumption of the family or even the individual within the family who requested it. By the turn of the century, the popularity of amateur photography brought about by the Kodak brownie camera had already made the need for a professional postmortem photographer even less necessary, particularly for those who wanted their desire to record the deceased to be more private. The photographic postcard format was popular among amateur postmortem photographers, but unlike other subjects, it was rarely sent through the mail as a postcard. When postcard images were sent, they were enclosed in a letter. Since the format was inexpensive and supplies were widely available it was often simply the format of choice for private consumption. By the end of the century, postmortem images in general were more frequently kept and put away rather than openly displayed or sent to relatives.

The practice of postmortem photography continued throughout the 20th century and is still alive in the 21st century. However, by the 1930s and 40s new funerary rites and customs had supplanted the high Victorian funerary practices. Death was no longer a socially acceptable topic of conversation; grief and mourning became very private, with view visible manifestations. In a manner of speaking, postmortem photography, once openly discussed and displayed, went underground.

Note: This article of necessity focuses on the 19th century Anglo-American practices of postmortem photography. A survey of practices around the world, focusing on places like Mexico, which have a rich and distinct tradition of postmortem photography, requires a separate series of articles.

BETH ANN GUYNN

See also: Daguerreotype; and Wet Collodion Positive Processes.

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POTTEAU, JACQUES-PHILIPPE (1807–1876)

J.-P. Potteau first practiced photography in 1861 when he was an assistant in the laboratory of malacology, at the Natural History Museum in Paris. His photographic work, at its beginning, is difficult to distinguish from that of Louis Rousseau, whose activity he takes over as the official photographer, in a field as vast as the museum's collections. Today he is better remembered as a portraitist, an important work undertaken as early as 1862 in his studio next to the botanical garden—Jardin des Plantes. Many foreigners visiting Paris where taken there and Potteau was able to portrait tens of people, members of Oriental embassies—China, Cochinchina, Japan, or Siam. He also started taking anthropological portraits of Algerians, Annameses, Bohemians, Indians, Italians, Kabyles and French. His photos are highly restrained: the models are posed either full face or side view, frontal, from a fixed distance, somewhat gravely. This approach to portraiture will be more frequently used, in the nineteenth century and later, for ethnography or even anthropometry. J.-P. Potteau's works, rich of more than a thousand photos, are yet to be fully explored. Most of his works is preserved at the Quai Branly museum in Paris.

JÉRÔME GHESQUIÈRE

POU Y CAMPS, JUAN MARIA (1801–1852)

Spanish photographer

One of the first daguerreian manuals to appear in Spain—*Exposicion Historica y Descripcion de los Procedimientos del Daguerreotipo y del Diorama* was translated from the inventor's original text by Joaquin Hysern y Molleras. It contained extensive notes on experiments carried out by Dr. Juan Maria Pou y Camps—one of the first to make daguerreotypes in Madrid—who also published the volume.

He had attended public demonstrations of the process in Paris, and recognised that the process could be improved significantly. By the end of October 1839 Pou and colleagues in Madrid had produced their first images, and before the end of 1839, their improvements and observations on the process had been incorporated into the manual.

One suggestion was the adaptation of the camera to act as a photometer. Thus he was probably the first

person to recognise that photographers needed some means of accurate exposure determination.

His interest in photography, however, seems to have been relatively short-lived, and there is scant evidence of further engagement with the medium after 1840.

Dr. Juan Maria Pou y Camps was born in Girona in northern Spain and studied pharmacy in Barcelona, becoming Professor of Pharmacy in Pamploma by the age of 28. By 1849 he was listed as Professor of Pharmacy at the University of Madrid. He died in Madrid in 1852.

JOHN HANNAVY

POUNCY, JOHN (C. 1808–1894)

Active from the daguerreotype period John Pouncy remained firmly a Dorset photographer based for his whole life in the county town of Dorchester—yet his reputation was international. His long career, his patents in 1858 (No.780), 1863 (No.267) and 1868 (No. 3849) for his carbon process and his venture into colour fine art reproduction should all be seen in the context of his obituary: he "displayed a strong will and firm determination, and when one he had convinced himself that he was right it was difficult to move him" (*Dorchester Chronicle*, 29 March 1894).This determination provides the context for the fraught reception of his claims since his reluctance to reveal the exact details of his discoveries clearly fostered popular disbelief and pedantic professional jealousies.

Pouncy was copying prints and drawings as early as 1855 but the un-gentlemanly grilling which this provincial entrepreneur received from the Photographic Society came to a head 1858 (with Roger Fenton in the chair) and was first unravelled by Arthur T. Gill in a series of two articles in 1965. The complex story of how a pioneer determined not be overwhelmed if not bullied by the combined scientific might of London prompted Gill to ask whether this surprisingly dramatic meeting "did not nearly come to blows" (*Photographic Journal*, February 1965, 57). To several authoritative audiences Pouncy demonstrated his ability to produce prints but he would not divulge the exact process—individual prints were, and still are, very convincing, but they did not lend themselves to mass production so Pouncy's discovery was soon superseded by more robust processes which could be applied on a commercial and industrial scale. The Victoria and Albert Museum holds at least one print which proves just how tonally rich Pouncy's images could be in comparison with the rather less satisfactory views reproduced in his famous publication *Dorsetshire Photographically Illustrated* (1857) which can claim to be the first to transfer photographic images into published illustrations—though these look much more like lithographs than photographs.

Pouncy, whose own confidence can hardly have been aided by the consistent misspelling of his name (Pouncey) over three consecutive meetings by the otherwise punctilious Photographic Society, was not going to be forced to reveal every detail of his revolutionary carbon process which promised to make permanent images often still infamous for their evanescence: he was well aware that he would "have the credit of one of the greatest discoveries photography has ever known" (*Photographic Journal*, 11 December 1858, 91). Despite this lack of commercial success it would still be true to say about him that "there need be no more lamentation over fading photographs" (*The Builder*, 31 October 1868, 800). It is clear that on many occasions that he could show examples of his process so it is with some justification that he claims "I can produce in printing ink of any colour direct from the negative photographic positives, negatives, transparencies, transfers for lithographic or press printing, and photographs in ceramic colours, which can be transferred to and burnt on china, earthenware, &c" (*British Journal of Photography,* January 13 1865, 18).

His process turned out in the end to be far less successful than that of Pretsch and Poitevin and their successors like Swan. Poitevin won the prestigious Duc de Luynes competition in France: Pouncy was awarded the silver medal and complained of French perfidy. Pouncy never conceded his claims and for a period of at least ten years in several countries continued such a concerted campaign that it has successfully baffled photographic bibliographers ever since. He certainly applied his skills in an apparently successful colour reproduction process for paintings in conjunction with his son Walter (the 1868 patent) which is still in need of a modern study by historians of art and printing quite apart from photography. The quite conventional Pouncy studios in Dorchester are the locus of several photographic puzzles needing further scrutiny. Even before taking up photography John Pouncy was a painter, glazier, carver, gilder and dealer in oil paintings so it is clear that he continued mix and apply these skills using photographic techniques to the point where the *Art Journal* gave a favourable endorsement in an undated article (presumably of the late 1860s) in relation to the colour copying of paintings by John Faed. This later manifestation of a permanent colour process was read to Photographic Society of Scotland in 1864 (described in *The British journal of Photography*, 1865). The extent of colour printing or application to ceramics associated with Pouncy remains uncertain.

Though Pouncy was championed by Thomas Sutton and was much feted, by the 1870s he would have known about the more viable variants of his process being brought to industrial success by photographers like Adolphe Braun and companies like the London Stereoscopic

Company but he continued to operate for another thirty years keeping secrets which are still only partially understood. He remained an independent pioneer: a sign outside his shop in Dorchester reinforces the proprietary nature of his claims "John Pouncy Inventor of Photographs in Carbon and Oil Colours on Canvas Panels. Inspection invited. To be only obtained from John Pouncy"

IAN LEITH

Biography

Pouncy lived his entire life in the market town of Dorchester maintaining his business in decorative materials as well as photography. Born in 1808 or 1809 he owned a succession of shops and studios in the town at least one of which proudly advertised his quite justifiable claims to photographic fame. His son Walter (1844–1918) collaborated with him and later operated in Swanage, Dorset. Elsewhere, he exhibited in Edinburgh)[1858, 1863, 1864) and London ([1862) receiving medals in Berlin (1865), Edinburgh (1863), and Paris. He died in Dorchester in March 1894.

See also: Fenton, Roger; Swan, Sir Joseph Wilson; Poitevin, Alphonse Louis; Pretsch, Paul; Sutton, Thomas; Braun, Adolphe; and London Stereoscopic Company.

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PRESTWICH, WILLIAM HENRY (1831–1912)

English photographer

William Prestwich was the head of a talented family most of whose members were engaged in some form of the photographic business. From 1870– 892, Prestwich ran a string of photographic studios in the London area, and at the same time took out a series of patents for improvements in lenses, emulsions, stereoscopes and lantern slides. This in turn led to the formation of the Prestwich Manufacturing Co., in T ottenham in 1895 with his son John, destined to become one of the pioneer firms in the field of cinematograph equipment.

The firm started as the Moto Photo Supply Co., in the City of London, and sold their products through the established firm of W C Hughes. Prestwich illustrated his first camera in the *Magic Lantern Journal Annual* (1897– 1898), following this with a demonstration at the Hackney Photographic Society. Several early motion pictures used it, notably by Prestwich's son Edward, including Queen Victoria's Diamond Jubilee, and W.G. Grace at Lord's. A fiction film, *The Artist's Model*, was made in 1898.

Prestwich retired at the end of the century, and the firm, later known as J A Prestwich Industries Ltd continued under John Prestwich's direction until his death in 1952. The firm was taken over by Villiers Engineering in 1964. William Prestwich died in Laughton, Essex November 1, 1912.

DAVID WEBB

PRETSCH, PAUL (1808–1873)

Austrian photographer

The publication in 1856 and 1857 by Paul Pretsch's Patent Photo-galvanographic Company of the first part of *Photographic Art Treasures or Nature and Art Illustrated by Art and Nature* was heralded as a new era of photo-mechanical reproduction, and as a practical means of bringing lower costs to the publication of photographically illustrated works.

However, the limitations of the process, the need for extensive retouching, and the lack of subtlety in the important mid-tones of the image, brought criticism and acclaim in equal measure from the photographic press. Five parts were published, each containing four images. Photographers included Roger Fenton, appointed

photographic manager of the company in 1856, William Lake Price, Lebbeus Colls, and William Howlett. Contributions by Oscar Rejlander and others were planned but never published.

Before the company went into production, Pretsch received a letter from Talbot requiring him to purchase a licence, as he asserted that Pretsch's process infringed his 1852 patent. There were fundamental similarities.

Paul Pretsch was born in Vienna and trained as an engraver. He moved to London in 1854 for the express purpose of exploiting his new process. Two British patents were granted in 1854 and 1855, and premises established in London's Holloway Road.

By 1858 the company had ceased trading, and Pretsch later worked for de la Rue as an engraver.

JOHN HANNAVY

PREVOST, CHARLES HENRY VICTOR (1820–1881)

French and American photographer

Victor Prevost was born in 1820 in La Rochelle, France. As a young man, he studied art in Paris with Paul Delaroche. He went on to work as a lithographer, and exhibited several lithographs at the Paris Salons of 1845 and 1846.

Soon after this, however, Prevost decided to go to New York City, where he began earning his living as a lithographer. In 1848 and 1849, Prevost worked for the lithographic forms of Goupil, Vibert & Co. and Sarony & Major.

From 1850 until 1852, Prevost worked in a studio with five other artists. One of the other tenants was a daguerrotypist, which may have piqued Prevost's interest in photography. Prevost's workplace was also only a few blocks from the Broadway studios and galleries of the major daguerrian portraitists of the city.

During the early 1850s, the daguerreotype was the primary photograph format in the United States. Although in 1840 William Henry Fox Talbot had introduced the calotype, a paper-based photographic process, he took out a patent on the process and required anyone interested in using it to license the technique. Only a few American photographers cared to do so, none of them in New York.

Meanwhile, the paper negative process was further developed by several Frenchmen. Gustave Le Gray, a French artist, developed a method of waxing the paper negatives before they were placed into the sensitizing bath, which allowed the negatives to be kept for two weeks before exposure, and then to be kept for up to a week before developing and printing. Le Gray published his findings in France in July 1851; they were translated and printed in America in 1852. One of the few American photographers interested in the new paper process was Victor Prevost.

In 1853, Prevost traveled to France to learn this new method of photography from Le Gray. While there, Prevost made a series of photographs of the French countryside, which were subsequently published in an illustrated edition of *Twenty Years After*, a historical novel by Alexandre Dumas. In these early examples of his photographic work, Prevost manages an exquisite feel for composition, and shows a mastery of the new technique.

Upon returning to New York in the latter part of 1853, Prevost set up a photographic studio at 43 John Street. Later that year, he entered into a partnership with Peter Comfort (P.C.) Duchochois, whom he had met in France. Duchochois became known for his prolific contribution to the photographic scientific literature.

In a New York City business directory for 1853, Prevost listed himself as a photographer. Other major photographers in the city continued to list themselves as daguerrians. The next four years were Prevost's most productive as a photographer, and resulted in the first paper-based photographs of New York City.

While some of Prevost's images echo standard scenes that were being engraved and lithographed for public consumption at the time, his photos display a more artistic sensibility, in keeping with his training. In New York City, Prevost mainly photographed outdoor scenes—commercial buildings, churches, backyards of urban residences, larger country estates and residences, and ships in dock on the Hudson. Similarly, the rural estates and scenes he photographed in upper Manhattan, West Point, New York, and several towns in New Jersey display a sense of scale more in line with the Hudson River School artists than with daguerrian portraiture.

Prevost entered some of his photographs in the photographic competition at the New York Exhibition of the Industry of All Nations at the Crystal Palace in 1853–1854. He was awarded several honorable mentions but his photograph made from a waxed paper negative lost the prize to one taken with the wet-collodion, glass-plate negative process. Nevertheless, Prevost was intrigued by the exhibition and took many photographs of the interior of the building, including several views of neo-classical statues, as well as the large machines exhibited.

In 1854, Prevost traveled to West Point to photograph the solar eclipse on May 26. Many daguerrotypists photographed this astrological event, but Prevost appears to have been the most prolific photographer, making nineteen exposures onto waxed paper negatives in quick succession. A subsequent album was made, showing the consecutive prints, as well as a smaller composite image printed from all the negatives.

That same year, photographs by Prevost and Ducho-

chois were published in the *Photographic and Fine Art Journal,* along with a note celebrating their work. Despite this praise, it was difficult for the two to compete with the successful daguerrian studios that dominated New York's photographic market. Prevost's partnership with Duchochois only lasted until 1855, after which he went to work for Charles Fredericks, another photographer who was expanding from daguereotypes to include paper photographs made from wet collodion glass plate negatives. While working for Fredericks, Prevost listed himself in city directories as a chemist, suggesting that he mixed chemicals or printed photographs for Fredericks.

In 1857, Prevost gave up on earning his living through photography. His wife Louise had been assisting her aunt at her school near Madison Square, Madame Chegaray's Institute for Young Ladies. Victor Prevost joined the faculty as a teacher of drawing, painting, and physics. He continued to work as an educator until his death.

Despite having abandoned photography as a career, Prevost continued to photograph the continually changing face of New York City. In the fall of 1862, he photographed and compiled an album of 35 views in Central Park, which was still undergoing construction. These albumen prints were made from glass negatives. In the late 1870s, he completed an album of eighteen photographs of the American Museum of Natural History. The photographs show the exterior of the building, completed in 1877, and several of its collections.

Prevost died in New York in April 1881. He was buried in Calvary Cemetery in Brooklyn. He was largely forgotten after his death, until a cache of his negatives was discovered in 1901, and he was thereafter celebrated as the creator of the first paper photographs of New York City.

Collections of Prevost's waxed paper negatives and/or surviving salt and albumen prints are held by the following institutions in the United States: George Eastman House, Metropolitan Museum of Art, Museum of the City of New York, New-York Historical Society, New York Public Library, and Smithsonian Institution.

JENNY GOTWALS

Biography

Charles Henry Victor Prevost was born in 1820 in La Rochelle, France. As a young man he studied art in Paris under Paul Delaroche. Prevost worked as a lithographer, and exhibited his work in the Paris Salons of 1845 and 1846. In 1849, Prevost was living in New York and was married to Louise Berault. Their son Emmanuel Emile was born in 1850. In 1853, Prevost went to France, where he learned Gustave Le Gray's new method for creating calotypes. From 1853–1855 Prevost had a partnership with P.C. Duchochois, and began taking paper photographs of New York City urban sights, and rural areas in upper Manhattan and New Jersey. Prevost exhibited his calotypes at the New York Exhibition of the Industry of All Nations at the Crystal Palace in 1854. From 1855–1856, Prevost worked for photographer Charles D. Fredericks. In 1857 Prevost began working as a teacher, and continued to work as an educator and principal until his death. Prevost died in New York in April 1881.

See also: Calotype and Talbotype, Fredericks, Charles Deforest; Great Exhibition, New York (1853–54); Le Gray, Gustave; and Waxed Paper Negative Processes.

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PRICE, WILLIAM LAKE (1810–1896)

English photographer

Like many early photographers, William Lake Price originally trained as a painter, turning to photography c. 1854. Before that date, his landscape and architectural watercolours had been exhibited widely, including several exhibitions at the Royal Academy in London, and the Old Water Colour Society.

He joined the Photographic Society of London shortly after its formation, and exhibited his work at the Society's Annual Exhibitions from 1855 until 1860. His work was predominantly both genre and portraiture, and his study 'Don Quixote in his Study' was widely exhibited, and also chosen as one of the photogalvanographic plates for the first series of Paul Pretsch's *Photographic Art Treasures* published in 1857. His portraiture subjects included Prince Albert, Owen Jones, and many of the leading Royal Academicians of his day, including William Powell Frith, Clarkson Stanfield and David Roberts.

Lake Price was a popular lecturer on many subjects relating to photography, and his lectures were widely published in photographic journals in both Britain and

Price, William Lake. Don Quixote in His Study.
The Metropolitan Museum of Art, Gift of A. Hyatt Mayor, 1969 (69.635.1) Image © The Metropolitan Museum of Art.

the United States. His book, *A Manual of Photographic Manipulation* was first published in 1858 by John Churchill in London, with a second edition published a decade later. He announced his retirement from photography in 1862, but returned to both practice and write about photography six years later, continuing to lecture and write intermittently until 1889.

JOHN HANNAVY

PRINGLE, ANDREW (b. 1850)
English photographer

To his contemporaries, Andrew Pringle was "a gentleman" and "usually polite and obliging." One of three brothers, Pringle was educated at Harrow School, then Trinity College, Cambridge, before serving in the 8th Hussars.

Pringle took up photography in 1874 and travelled in France, Germany, Switzerland, Italy, Spain, and Africa. He investigated all processes and, with Professor W K Burton, published *Processes of Pure Photography*. By 1886, he specialised in photomicrography and at a dermatological congress, Pringle created a sensation by illustrating a rare bacillus. He wrote textbooks on the optical lantern, and on photomicrography, and contributed illustrations to *Kleine's Histology*.

When he was President of West Kent Amateur Society, *The Photographic News* of 1889 asserted that Pringle never took offence "until his good nature was rudely strained by the incautious." His procedures were methodical and by noting every factor affecting development, as well as "anything else that occurred to me," he identified "the secure exposures, the doubtfuls and the 'instantaneously'-exposed plates, which were sure to require more or less care."

Pringle was a Fellow of the Royal Meteorological Society and a former president of the Photographic Convention.

RON CALLENDER

PRINTING AND CONTACT PRINTING

Shortly after William Henry Fox Talbot produced his first successful images with his Photogenic Drawing process in 1834, the concept of printing was introduced into the practice and language of photography. This

marked the most radical difference between the daguerreotype and the paper negative. The unique direct positive of the daguerreotype may, initially, have offered finer detail and higher quality, but the ease of duplication via the negative marked the real birth of photography as we know it today.

It was inspired thinking on Talbot's part to recognise that the lights and shades, reversed in his photogenic drawing, could be restored by exposing another sheet of salted paper in contact with the negative. Just as the original photogenic drawing paper was exposed in the camera until a visible negative image of the required strength was achieved by the action of light alone, so the first positive prints were exposed in contact until the positive achieved the required density. No development was originally involved, with the exposed and printed-out image then simply fixed and washed.

As Robert Hunt wrote, in 1857, in his *Manual of Photography,*

> The copying frame is an indispensable requisite to the photographer: it is used for copying all objects by transmission, and for multiplying the original pictures, obtained by means of the camera obscura from nature: it is, indeed, the printing-press of the artist.

The 'copying frame' remained the essential tool of the photographic printer for several decades, with racks of frames arranged outdoors and directed towards the sun—as seen in the celebrated panorama of Talbot and Henneman's printing establishment at Reading. Because of the low sensitivity of the material, and the inherent density of the negative, printing on a commercial scale only became viable once the negative was waxed or oiled to increase its translucency—and thus reduce exposure times. Only then could multiple copies be made within an acceptable time frame—the approach adopted by Talbot for *The Pencil of Nature* (1844) and *Sun Pictures in Scotland* (1845).

Commercially available printing frames used two sprung bars across the back to hold the negative in close contact with the positive paper. A hinged back allowed for one spring to be released, and the printing paper gently folded back to assess progress.

The 'salt print' as it became known, remained, essentially, the same material which had been used in the camera, the only difference, as it evolved, being the introduction of a 'developer' to reduce exposure times. That 'developer' was not dissimilar to the sensitizing bath used to activate the light sensitive chemistry before exposure—namely silver nitrate, acetic acid and gallic acid.

The idea of developing prints was originally proposed as an expedient for printing on dull winter days—where light levels might double or even treble exposure times. Sparling's *Theory and Practice of the Photographic Art* (1856) advised that 'positive printing by the negative method,' as the production of developed prints was known, should only be undertaken by the most skilful. Quoting another eminent teacher on photography, he reported that

> Mr Hardwich advises the amateur to master the manipulation of the ordinary positive process before trying that by development… … The exposure to light is conducted in the ordinary printing frame: it extends from a few seconds upwards. On removing the negative a very faint image is seen, which develops rapidly when the gallic acid is applied. The development being completed, the prints are well washed and fixed in hyposulphite of soda, one part to four of water. The tint is improved by adding a little nitrate of silver (a few drops of the exciting bath) to the gallic acid towards the end of the process, but a better plan is to tone the prints in the gold bath

The quality of the salt print, correctly exposed and processed, was high, and despite the introduction of the albumen print in 1850, salt prints remained popular with many users well into that decade. Thus, many of the prints published in 1856 after Roger Fenton's trip to the Crimea were developed salted paper prints—and despite problems of fading experienced by many users, many of Fenton's Crimean images retain their original richness.

Albumen printing paper, introduced in 1850 by Blanquart-Evrard of Lille, offered a higher concentration of silver halide, contained within a thin layer of egg-white on the surface of the paper, significantly enhancing the sharpness of the print, and extending the tonal range. Like salt prints, albumen paper could be used either as a printing-out paper or as a developed paper with a significantly shorter exposure. As Blanquart-Evrard's intention in introducing the paper was to introduce commercial production methods, the developed print was the norm, and with it, he claimed to be able to produce in excess of two hundred prints per day from a single negative. That represented a remarkable progression from the original printed-out salt print, where the daily output from a single negative was counted in single figures.

Guidance on the progress of the printed-out image, assessed by inspection, was offered in many manuals. Sparling (1856) advised that

> if the general aspect of the print is a rich chocolate-brown in the case of albumen, a dark slate-blue with gelatine or ammonio-nitrate paper, or a reddish-purple with paper prepared on serum of milk, probably the subsequent colouration will proceed well.

Again, the printing frame was the only piece of equipment necessary—that is until the introduction of the Solar Enlarger in 1857. David Acheson Woodward designed and patented the idea of the solar enlarging camera, able to make enlarged life size prints from

quarter plate and half plate negatives with an exposure of about forty-five minutes. The camera used a mirror and condenser lens to focus sunlight on to the negative, the image being projected on to the paper via a copy lens. Patented improvements to the solar enlarger, in the 1860s and 1870s saw it equipped with a heliostat—a clockwork motor to rotate the mirror—thus ensuring that the light beam remained concentrated on the condenser lens throughout the exposure.

A modification of Woodward's design, introduced in 1864 by Desiré Charles Emanuel van Monckhoven, was the first instrument to really look like an enlarger. Fitted into the wall of the darkroom, it gathered light in the same way as Woodward's apparatus, but used a more complex lens assembly to correct for spherical aberration and thus produce a sharper more evenly illuminated print.

The enlarger, faster printing emulsions, improved processing chemistry and brighter light sources revolutionised the production of prints by the 1890s.

By that time, though, the higher and higher quality and sharpness of the print had prompted some image-makers to revisit the impressionistic quality of the paper negative and salt print, and also to invent, explore and develop alternative readings of the positive image through ink, gum, platinum, carbon and other printing processes. Together, they offered photographers a huge diversity of means of expression by the century's end.

JOHN HANNAVY

See also: Salted Paper Print; Albumen Print; Developing; Enlarging and Reducing; and Permanency and Impermanency.

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PRINTING-OUT PAPER

While the idea of printing-out paper is as old as photography itself, such products remain available today, meeting the needs of a small specialist market where the unique characteristics of such papers are still sought after. Today's papers, based on gelatine-silver chloride technology, can trace their lineage back to the 1880s, but the first printing-out papers were used by Fox Talbot in the 1830s.

The term, 'Printing-Out Paper,' and its abbreviated form P.O.P. date only from the early 1890s, when Ilford Ltd in England coined the phrase and introduced it as a trade name for their silver chloride paper, but it has since been applied retrospectively to a large group of printing materials.

The essential and defining characteristic of a printing-out paper is that the image is produced by the action of light alone. There is no chemical amplification of that image by development, the printing going through the simple stages of exposure, fixing and washing, or exposure, toning, fixing and washing, the latter sequence resulting in a richer print colour and greater permanence.

Generally speaking, the earliest printing papers were of very limited sensitivity, requiring long exposures in contact with a paper or glass negative. They could be toned, fixed and washed in relative well-lit spaces, and certainly by candlelight. Thus, such prints were not dependent upon a safe-lit darkroom. Their modern counterparts, however, require to be treated with a greater deference if optimum print quality is to be maintained.

Printing-out papers fall into three categories, two of which are based on silver halide chemistry. The third group comprises processes such as cyanotype (qv), using non-silver-based light sensitive chemistry, where the exposed print is washed to remove soluble salts after exposure.

The two major silver-based groups are salted papers and those papers where the light sensitive chemistry is held in an emulsion or carrier coated on to the surface of the paper itself.

Fox Talbot's salted paper—effectively the same material used to make a negative in the photogenic drawing process—was the first printing process, achieving widespread popularity and almost-universal dominance for more than a dozen years. Although it could be used as a developed paper—with exposure times reduced from hours to seconds—many amateurs and professionals alike continued to use it without development. There

were advantages—the developed image rarely exhibited the extended tonal range of the printed-out version.

The same was true of albumen paper, the first paper to carry the image on the paper surface, and introduced in 1850s by Blanqart-Evrard. Although conceived as a developed printing material—to facilitate printing on an industrial scale—albumen was used by a large percentage of photographers, again amateur and professional, as a printing-out material. It was easier to manipulate, more predictable, and less susceptible to the vagaries of changing chemical strengths and conditions.

Granted, developed papers were faster to use, but only when large production runs of prints from single negatives were being made, were such considerations important. In the home darkroom, or small professional studio, printing was a lengthy process in any case. Salted paper had to be made by hand by the photographer, and while albumen paper could be bought already coated with the albumen layer and some of the chemistry, it had to be sensitised and dried before it could be used.

In 1866, the Frenchman Juan Laurent in collaboration with Spaniard José Martínez-Sánchez perfected 'Leptographic' paper ('Leptofotografía'), a collodio-silver chloride printing paper which was sold ready to use. The light-sensitive silver chloride was held in a binding layer of cellulose nitrate, separated from the paper by a layer of barium sulphate (later known as baryta), giving a much whiter base colour to prints than had been previously possible with albumen paper. The baryta layer acted as a barrier, eliminating the spotting from rusting metal particles in the paper which sometimes happened with albumen papers, and at a stroke, the introduction of this paper removed from the photographer all the paraphernalia of having to sensitize the paper before use, as had been needed with albumen. As the manufacturers claimed it had three times the sensitivity of albumen, exposure times for contact printing could also be reduced significantly. Despite such promise, the paper was not a commercial success, and it would be the 1880s before ready-made silver chloride papers achieved significant popularity.

In 1882, William de Wiveleslie Abney published the procedure for making a gelatine-silver chloride paper, but it did not immediately go into production.

One of the first collodio-chloride papers to achieve success—and very similar in chemistry to Laurent's—was introduced in 1884 by Paul Eduard Liesegang of Dusseldorf, who called his paper 'Aristotype.' In the following year, fellow Germans Ashmann and Offord added gold to their emulsion, and in so doing created a paper which self-toned in the fixing bath, eliminating one of the processing stages.

It has been argued that, after the introduction of commercially manufactured gelatine dry plates, the commercial manufacture of ready-to-use printing papers was driven not by an increase in printing efficiency, but the continuation of the subtle print quality which had been possible with albumen. Collodion and gelatine-based printing papers, when developed, produced a neutral image, whereas when used as printing-out papers, the rich warm brown tones of the gold-toned albumen paper could be imitated.

The year after Liesegang's success, in 1885, the Britannia Works Company in England—forerunner of Ilford Ltd—introduced the first of their gelatine-based silver chloride papers, a product which was replicated throughout the world by several companies. It is the successor of that gelatine-based silver chloride emulsion which persist as a specialist product today.

JOHN HANNAVY

See also: Cyanotype; Salted Paper Print; and Albumen Print.

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PRITCHARD, HENRY BADEN (1841–1884)

Henry Baden Pritchard was born on 30 November 1841 the son of Andrew Pritchard the well-known optician, spectacle and optical instrument maker. He was educated in Eisenach and Lausanne and entered the War Department at Woolwich Arsenal in 1861 at the age of twenty and remained there until his death, superintending the photographic branch. He married Mary Evans in 1873 after meeting her at the house of his friend H.Pp Robinson in Tunbridge Wells.

Pritchard joined the Photographic Society in 1868 and was elected to Council in 1870, he became Honorary Secretary in 1872, returned to Council in 1874 and

was Vice President at the time of his death. Between 1868 and 1877 he published twelve communications in the Society's journal. He was treasurer of the Photographers' Benevolent Association.

In 1880 Pritchard took over as editor of the *Photographic News* after the death of G. Wharton Simpson and extended the journal's reporting of news and scientific coverage. His *The Photographic Studios of Europe* (1882, second edition 1883) was based on his original reports carried in the *Photographic News* between 1880 and 1883. He also edited the *Year Book of Photography* from 1881–1884. Pritchard wrote or edited other photographic technical books and contributed numerous papers to photographic, scientific and other journals. He was elected a Fellow of the Chemical Society in March 1872.

Although his photographic activities were prolific Pritchard also published several novels and a play. He died suddenly of pneumonia at Blackheath, Greenwich, on 11 May 1884 at age forty-three.

MICHAEL PRITCHARD

PROCESS PHOTOGRAM

The precursor to *The Process Photogram* was an ad hoc series of articles and reports in *The Photogram* from its launch in January 1894. Subsequently *The Process Photogram* would claim its launch date as January 1894. *The Photogram* was edited by Henry Snowden Ward who had a particular interest in photo-mechanical processes and he justified its inclusion in what was primarily a photography journal by stating: 'we believe that photo-processes are on the eve of great advancement.' That statement was not misplaced as the 1890s saw a significant increase in interest in all methods of transferring photographic images on to the printed page through a mechanical press using inks. Three-colour work and the reproduction of photographs in periodicals and catalogues were particular concerns of the magazine.

In January 1895 *The Process Photogram* was launched as a separate supplement. Snowden Ward stated: 'The Process Photogram is the outcome of a double wish. Photographic readers wished for less process matter while photo-mechanical readers expressed a wish for more. To meet both we start a new edition at first, with only eight extra pages, devoted to purely process matter.' The initial print run of 1000 was increased to approximately 2000 after A W Penrose & Co offered to send it free of charge to their customers. *The Process Photogram* was strongly practical in its articles and focused on trade news and apparatus, descriptive visits to companies, theoretical articles on, for example, printing screens and reviews of patents, new techniques, processes and equipment. In 1896 the supplement added '*and Illustrator*' to its masthead which it retained until volume XII number 144 of December 1905. Number 145 of January 1906 number 145 saw the journal being renamed *The Process Engraver's Monthly. The Process Photogram.*

From January 1907 it appeared as a totally separate publication from *The Photographic Monthly* (the successor to *The Photogram*). Its stated aim was to be the representative organ of all who used photo-mechanical and photo-chemical methods of illustration: workers in zincography (line and half-tone), collotype, photolithography, photogravure, Woodburytype and other photo-reproduction processes and to provide an epitome of technical progress and discovery and a means for the discussion of commercial subjects. It's size and pagination was increased and it promised new pictorial, confidential (trade) and special supplements.

The Process Engraver's Monthly, with the subtitle *Process Photogram* until 1947, continued until volume 56 (1956) when it became *Process: the photomechanics of printed illustration*, and from 1961 *Graphic Technology*.

MICHAEL PRITCHARD

See also: Ward, Henry Snowden; and Woodburytype, Woodburygravure.

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PROJECTORS

The projection of glass-based images was already commonplace when photography was introduced. The slide projector, or magic lantern, had been invented in the seventeenth century, perhaps by the Dutch scientist Christiaan Huygens, and was in widespread use in Europe by the end of the century. The popular Phantasmagoria was a ghost-show using lantern projections. Few projectors dating from before 1800 have survived. A typical magic lantern of that date comprised a rectangular or cylindrical metal body containing the illuminant (an oil lamp) capped with a chimney or cowl, hooded to reduce lightspill. The arrangement of the internal components was: concave metal reflector, lamp, then a large glass condenser lens to concentrate the light. The slide stage, an external construction of grooved supports into which long glass painted slides could be moved along, was fixed in alignment with the condenser. In front of the slide stage was the objective, or focusing, lens; a sliding tube containing one or more glass elements.

Soon after the introduction of photography, photographic images were being made on glass. To show

photographic slides at their best, magic lantern lenses needed improvement. Spherical aberration, which blurred the edges of the projected image—more evident with the fine detail of a photograph than with earlier painted scenes—could be reduced when the Petzval lens, designed for cameras in 1841, was adopted for slide projection. Chromatic aberration, causing color fringing—which became more apparent with monochrome photographic images—was corrected with the introduction of achromatic lenses.

In Britain in particular, from the 1850s, many magic lanterns had wooden bodies, usually with a sheet metal lining to protect the wood from the internal flame, with a metal dome top and cowl. These wood-bodied projectors, being cooler externally, were safer to operate. The external metal parts were usually made from brass and lacquered, the device taking on a prestigious appearance, conferring status to the user.

From mid-century, professional users of the lantern—lecturers and showmen—started to employ limelight as an illuminant. Hydrogen and oxygen gases from leather bags (later, metal cylinders), were mixed in the limelight burner to produce a strong flame. This flame played on a small cylinder of quicklime, which glowed white hot. Much brighter than an oil lamp, limelight could produce very large screen images.

Other illuminants introduced included, from the 1850s, the electric arc lamp—though providing the necessary current was difficult and limited its use—and from the 1890s, acetylene.

One important magic lantern, the Sciopticon, developed in the United States in 1869, had a larger condenser than usual to avoid cropping the corners of a projected image and an improved lamphouse for cooler running.

From the 1830s, it became the practise for advanced presentations to use two magic lanterns mounted side-by-side, with a manually-operated rocking double-shutter arrangement in front of the lenses. Each shutter had a serrated edge, and as the shutter unit was operated the image from one projector gradually faded out as the image from its twin projector faded in, producing a dissolve effect. These pairs were difficult for one operator to manage, and in the late 1850s the vertical double or biunial lantern was introduced and eventually became popular. With one lantern above the other, manipulation of the slides was easier. From the 1870s the triple lantern (some versions known as triunials) started to appear from English, German, and later American manufacturers. Some biunial and triunial lanterns had slots in which glass filters could be placed, useful for giving instant color tints to photographic slides.

A different method of construction became popular in the United States. The base of the lantern comprised two parallel metal rods, on which the components—reflector, illuminant, condenser unit, slide stage and focusing lens—were mounted. Each component could slide to and fro, enabling very easy adjustment of their relative positions. Vertically stacked double and triple versions were also manufactured. In America slide projectors—especially biunials—became known as stereopticons, even though the image was not stereoscopic. (Today, the term can lead to confusion as it is also used to mean a hand-held or cabinet 3-D viewing device).

Most early slides were set in wooden frames, but from the 1870s mechanical slide holders made the changing of unframed glass slides easier.

Special lanterns for the projection of opaque pictures and objects, including (from the 1840s) photographic images, were known as episcopes, megascopes, or wunderkameras. Epidiascopes could also show transparent slides.

The first color photographs, made using the additive process by James Clerk Maxwell in Britain in 1861, were projected by means of superimposed slides from three magic lanterns, each with a color filter: red, green, and blue.

From the late eighteenth century, lanterns for domestic use were made in Germany, which continued to be a major producer throughout the nineteenth century, during which production became widespread in England, France, and the United States. Most lanterns for use in the home had simple pressed steel bodies, and used paraffin (kerosene) lamps. The finish was sometimes bare metal in the early days, and later a black 'lacquer' (paint), or a chemically-produced blue metallic effect. From the 1840s to the 1920s, the miniature magic lantern was a popular children's toy. Slides were mostly painted or lithographed, but some later German and English toy lanterns showed photographic slides made in small sizes.

Photographic societies frequently projected slide images made by their members, and this use of the lantern for amateur photography extended its sphere of operation. A specialist use was the projection of microphotographs, by means of a high-power magnifying attachment. Some lantern users, especially those with church and scientific connections, were uncomfortable with the term 'magic,' referring instead to the 'optical lantern.'

Photographic motion pictures came to the lantern screen from 1895–96, and would eventually become a special branch of optical projection. Many early film machines could also show conventional lantern slides, usually by the operator simply pushing the lamphouse from the cinematograph mechanism to the slide stage.

During the twentieth century, the magic lantern evolved into the 35mm slide projector.

STEPHEN HERBERT

See also: Lantern Slides.

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PROUT, VICTOR ALBERT (active 1850s–1860s)

English photographer

Prout was an early professional photographer largely recognised today for his three distinct early 1860s publications: *The Interior of the Abbey of Westminster: The Thames, from London to Oxford, in Forty Photographs,* and *Mar Lodge, August 1863. A series of photographs illustrating the visit of their Royal Highnesses the Prince and Princess of Wales to Mar Lodge, the seat of the Rigfht Hon.the Earl and Countess of Fife, during the Braemar Gathering of 1863.* The Westminster Abbey folio, published by P.&D. Colnaghi & Co.Ltd. in 1860, contained 23 albumen prints showing the abbey's ancient monuments. Prout made good use of the dramatic natural light for these early interior views. Later, photographs from this series were published as stereos by the publisher James Elliott. The most distinctive of his works is undoubtably the unique series of 40 panoramic views of the Thames, England's greatest river. The publication is not dated but was produced around 1862 in two parts and published by Virtue & Co. The tranquil wide-angle views were made with a special panoramic camera built for Prout by London opticians Ross & Co.When first published the Thames river photographs were not credited to Prout but have been attributed to him since. The Mar Lodge publication contained 70 studies, ranging in size from carte-de-visite to whole-plate, were published by Prout in 1864. The tableaux-style photographs were staged for the camera by the actor and artist the Hon. Lewis Wingfield (1842–1891). All of Prout's known images are well-executed, exhibiting good technique and careful use of daylight to produce his collodion negatives. He exhibited his architectural studies along with copies of paintings at London photographic exhibitions between 1856 and 1862 and operated a portrait studio at 15 Baker Street, Portman Square, London from 1862–1865. Prout was able to produce a wide range of high-quality work, all of it artistic in style and content. However, he seems to have had little commercial success and in the mid 1860's moved to Australia and worked as a studio photographer with Freeman Brothers in Sydney from around 1866. He is known to have made the only photographic portrait of the colonial artist Conrad Martens.

IAN SUMNER

PULITI, TITO (1809–1870)

Italian

Tito Puliti (1809–1870) trained as a pharmacologist before becoming an assistant in the Royal Museum of Physics and Natural History in Florence. There, on 2 September 1839, in the presence of Giovanni Battista Amici, he made the first daguerreotypes in Tuscany—and probably the first in Italy—by following instructions received the day before. On 7 October, in the third session of the first meeting of the Society of Italian Scientists, which was held at Pisa under the patronage of Archduke Leopoldo II, Puliti exhibited his daguerreotypes to the delegates, having already shown them at the Accademia delle Belle Arti in Florence. At the end of the session he was invited to demonstrate the process on 10 October by taking a daguerreotype of the Cathedral buildings from the hospital of Santa Chiara.

GRAHAM SMITH

PULMAN, GEORGE (d. 1871)

English-born photographer

George Pulman was originally from Manchester, UK, and travelled to New Zealand after the Land Wars of the 1860s. In 1867 he commenced business with his wife, Elizabeth Pulman, as the proprietor of a photographic studio in Shortland Street, Auckland, specialising in topological and portrait photography. Upon George's death on 17th April 1871, Elizabeth took over the photographic business, which went on to become one of New Zealand's most influential studios. In later years Elizabeth was aided by her son Frederick Pulman. Although there is a large archive of surviving photographs held in museums, particularly of their

Maori portraits, as the photographs were identified under the studio name it is difficult to assign whether the photographer was George, Elizabeth, or Frederick Pulman. However due to their flattering and sympathetic style of portraiture that allowed the personality and individuality of the sitter to come through, it appears that they were commissioned by a large number of Maori clients. To emphasise the Maori identity of individuals the studio owned and used cloaks, hei tikis (pendants), meres (clubs), taiahas (spears), and huia feathers so that they could enhance the 'Maoriness' of those portrayed. The Pulman Studio was sold shortly before Elizabeth Pulman's death in 1900, including a selection of landscape negatives that were purchased and subsequently reprinted by the New Zealand Government Tourism Department.

JOCELYNE DUDDING

PUMPHREY, WILLIAM (1817–1905)

English photographer

Born on February 4, 1817 in Worcester, the son of a Quaker glove-maker, William Pumphrey held the daguerreotype licence for York from 1849—only the second photographer to operate in the city—having acquired the photographic interests of Samuel Walker the licensee since 1844.

Before taking up the new profession of photography, Pumphrey had trained as a science teacher, and taken up a teaching position in York in 1845. When William Henry Fox Talbot relaxed his calotype licensing terms in 1852, Pumphrey started to exploit the process producing and publishing portfolios of views of the architectural heritage of York and its environs. The earliest dated examples of this aspect of his work date from October of that year.

Throughout 1853, he published a sixty-image part work of these views, but by the following year he is believed to have sold his studio and taken up a position as superintendent of an asylum.

Thereafter his enduring interest in photography appears to have been as an amateur. In 1866 he organised an exhibition of art and industry in York, including a number of his own stereoscopic views. A second exhibition in 1879 was also successful.

He retired to Bath in 1881, and moved to Bristol in 1895 where he died ten years later on 28th March.

JOHN HANNAVY

PUYO, ÉMILE JOACHIM CONSTANT (1857–1931)

French photographer

Émile Joachim Constant Puyo was born in Morlaix in 1857 and died in 1931. He was a French Army officer, serving first in artillery, being after promoted to commander (Commandant was sometimes used as his nickname). He served in Algeria them returned to Paris to the commanding office. He practiced photography from 1887 and ended leaving the army in 1902 to pursuit a photographic career.

Entered the *Photo-Club de Paris* in the mid 1890's. This association published the *Revue Française de Photographie* were he published many photographs as well as technical articles. In these texts he promoted pictorialism, as an aesthetic, was well as a *technically* based movement. In 1896 Puyo wrote *Notes sur la Photographie Artistique*, the first of many articles and books on equipment and processes that he would publish throughout his career.

Along with Robert Demachy he was one of the best known French pictorialist photographers photographing folk types, landscapes and mostly the female figure. He was a pioneer of several painterly processes, mostly bromoil, used by their ability to create an unrealistic rendering, closer to painting than to photography. He used soft-focus lens in order to achieve the same goal. His work was widely successful and he was published in many countries outside of France including Alfred Stieglitz's *Camera Work*. He participated in many exhibitions, including a group show promoted by Stieglitz in 1906 and a 1931 Paris retrospective with Demachy.

He continued to practice pictorialist photography after World War I, after his friend Demachy abandoned photography and the Photo-Secession in New York ended.

His work is now present in many collections, including 160 images in the French *Médiathèque de l'architecture et du patrimoine.*

NUNO PINHEIRO

Q

QUINET, ACHILLE LÉON (1831–1900)

French photographer and studio owner

Born in 1831, Achille Quinet was a successful photographer who operated a studio at 320 rue St Honoré, Paris from about 1869 to 1879. Although Quinet made photographs of the moments and architecture of Paris as well as a series of views of Italy, he is best known for his landscape, animals and figure studies, many of which were made in or around the town of Barbizon and the forest of Fontainebleau. These photographs, which were likely intended as aids to painters, are generally albumen prints mounted on blue card stock, with the stamp "Étude d'Après Nature' as well as a red rubber stamp of his name. Some images are mounted on white stock with the blind stamp "*A le. Quinet fils.*"

A member of the Sociéte Française de Photographie from 1876 to 1894, Quinet exhibited his work at the universal exhibition of 1878. Most of Quinet's work is housed at the Bibliothèque Nationale, Paris, where he deposited his *Etudes* at the Depôt Légal in 1868, 1875, and 1877. Quinet's work is occasionally confused with that of his contemporary, Constant-Alexandre Famin. While the pair made photographs with similar subject matter, general stylistic differences distinguish the two. It is possible that Quinet, acting as a publisher or distributor, placed his own stamp on works made by Famin. After 1879, Quinet moved to Cély, near the Forest of Fontainebleau, where he died in 1900.

SARAH KENNEL

R

RAMON Y CAJAL, SANTIAGO (1852–1934)

Santiago Ramon y Cajal (1852–1934) is famous in Spain as its sole Nobel Prize winner. He shared the prize in Medicine in 1906 with Golgi. His professional practice was a principal but not sole driver of his interest in photography.

His passion for photography dated back to his childhood, with his introduction to the amazing detail of daguerreotypes. He practiced many of the various process advances as they came along, including 'inhaling the delicious aroma of collodion' and then the beautiful gelatine-bromide emulsions.

He was important for photography in Spain and internationally as he experimented with and published papers and books on numerous processes in the late 1800s and early 1900s, especially in stereo and in the new color technologies as they emerged, and in his pursuit of color images of microscopic subjects. He promoted photography in Spain, and when the Photographic Society of Madrid was founded in 1899 (later the Royal Photographic Society) he was named honorary President.

He experimented with many processes, especially the Autochrome process, and contributed to getting consistent results with the Lippmann process. With his skills as a microscopist it was easy for him to section his Lippmann images and directly show their internal layered structure (others who published such sections included Edgar Senior, Richard Neuhauss, Herbert Ives and Hermann Krone). Some of his conventional images, including a beautiful autochrome self-portrait, are in the collections of the Instituto Cajal in Madrid. His draft for his book on color photography (1912), held at the National Library, is hand illustrated in color. A view of it is reproduced in Sougez's *Historia de la Fotografia* (1991).

Besides the book, which received wide use in Spain, and his articles in technical journals all over Europe, he published a number of articles on photography, stereo photography and color photography in popular Spanish journals.

His Nobel was for his pioneering efforts in the development of contrast-enhancing stains for microscope slides and for his drawings of the microscopy of the human nervous system, including the delineation of neurons and their connections. These drawings still set a standard for accuracy in current medicine, and his stains are still in use. He and Golgi were at odds over the nature of the neuronal system. Cajal's viewpoint is more in line with the modern one.

WILLIAM R. ALSCHULER

See also: Daguerreotype; Spain; and Neuhauss, Richard.

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RAOULT, JEAN (IVAN PETROVICH) (active 1860s–1880s)

Professional photographer

French by birth, Jean Raoul was owned a photographic studio in Odessa in 1860-1880s. He created ethnographic photographic studies in many areas of Russia. In late 1870s Raoul published the album "Collection de

types des Peuples de Russie, Roumanie et Bulgarie," a collection of "folk types," shots of everyday life and surroundings, mostly from Russia's south, which consisted of more than 200 photographs. Raoul's photographs of 1880s depicting landscapes, the people and the antiques of the Caucasus, the Crimea and the Volga river were also assembled into albums. In 1877–1878, during the Russian-Turkish War, Raoul travelled to Romania and Bulgaria where he photographed the military actions of the Russian forces. In 1879–1882 during the expedition to the Northern Caucasus, Georgia and Armenia and later to Athos and Palestina devoted to the searching for the Christian antiques Raoul was a photographer accompanying Prof. N. P. Kondakov. In 1884 staying in Constantinople after one of Kondakov's expeditions, Raoul decided to returne to France. In 1890s he owned a photographic studio in the south of France. He won prices at the Paris Geographic Exhibition (1875) and at the World Exhibition in Paris (1878) for photographs of people of Moldavia, Bessarabia and Odessa.

ALEXEI LOGINOV

RAU, WILLIAM HERMAN (1855–1920)

American photographer

William Herman Rau, a successful commercial photographer, was born in Philadelphia, Pennsylvania on January 19, 1855 to German and Swiss immigrant parents Peter and Mary Elizabeth Witschi Rau. He began his photographic career at thirteen as an assistant to Philadelphia photographer William Bell, and in 1874 served as a photographer with the United States government's Transit of Venus expedition in the South Pacific, the first of many photographic journeys. In 1881 he and Philadelphia photographer Edward L. Wilson embarked on a photographic trip through the Middle East, and Rau made subsequent photographic journeys to many other countries including Belgium, Germany, France, the Netherlands, Italy, England, and Mexico. In 1891 and in 1893 he received the important commission of photographically documenting the Pennsylvania Railroad's lines for promotional purposes, and in 1895 received a similar commission from the Lehigh Valley Railroad. Rau also served as the official photographer for the 1904 St. Louis World's Fair and the 1905 Louis and Clark Exposition. From 1886 until his death he operated a busy commercial studio in Philadelphia with an extensive stock of lantern slides. Rau was active in photographic associations including the American Lantern Slide Interchange and the Photographic Society of Philadelphia. William Rau died in Philadelphia on November 19, 1920.

SARAH J. WEATHERWAX

READE, JOSEPH BANCROFT (1801–1870)

English chemist

The Reverend Joseph Bancroft Reade was born in Leeds, Yorkshire, and was ordained as a deacon in the Church of England at the age of twenty-four.

His interests in chemistry date from an early age, and interests in science and microscopy endured for most of his life. He served as President of the Royal Microscopical Society in 1869 and 1870.

Of particular interest in considering his engagement with photography is a letter he wrote in 1839, quoted by Sir David Brewster in 1847, describing a photographic process involving the use of silver nitrate and gallic acid, and which was fixed with 'hypo.' Brewster asserted that Reade's successful experiments may have predated Talbot's calotype patent by up to two years. It was later claimed that, having lectured on his process in 1839, Reade had 'published' his process before Talbot's patent was granted.

Research has demonstrated, however, that the reports of Reade's lecture and letter were partial and the dates incorrect. His process was a modification of Talbot's *photogenic drawing* process, and his reference to hypo post-dated Herschel's publication of his researches on the chemical.

Notwithstanding that, Reade's 'priority' was quoted by lawyers for Martin Laroche in the court case *Talbot v Laroche* in 1854, in an attempt to undermine Talbot's legal position.

JOHN HANNAVY

REEVE, LOVELL AUGUSTUS (1814–1865)

English publisher of photography

Through his many publications Lovell Reeve advanced public expectation of the photographically illustrated book.

Born in London, Reeve was apprenticed to a grocer, but his interests quickly focused on natural history and his first book, *Conchologia Systematica,* was published in 1842 or 1843. His interest in shells and natural history in turn led to an engagement with stereoscopic photography.

His first book as publisher, in 1858, was Charles Piazzi Smyth's *Tenneriffe: An Astronomer's Experiment*, the first book to be photographically illustrated with stereographs. It presented twenty pairs of prints mounted on the octavo pages of the book, and Reeve initially commissioned Negretti & Zambra to design and manufacture a stereo viewer especially for viewing book-mounted images.

The Stereoscopic Magazine first appeared in July 1858, and continued until early 1863, publishing three stereo images per month, by Fenton, Howlett and others, with accompanying texts 'by Writers of Eminence.' Reeve also published periodic sets of stereo cards under the umbrella title *The Stereoscopic Cabinet*.

The Conway in the Stereoscope with text by James Davidson and twenty stereographs by Roger Fenton, was published in 1860, and additionally contained advertisements for other proposed publications and sets of images, several of which are presumed never to have been published. Many of the images from the book were re-published in *The Stereoscopic Magazine.*

JOHN HANNAVY

RÉGNAULT, HENRI-VICTOR (1810–1878)

French photographer and scientist

Henri-Victor Régnault was born on 31 July 1810 in Aix-la-Chapelle (now Aachen, Germany). Régnault, who used the given name "Victor," was the only son of André Privat Régnault, a military geographic engineer in Napoleon's Imperial Corps, and Marie Thérèse Massardo. His father died on the Russian campaign in 1812 and his mother died six years later, leaving the eight-year-old Victor and a younger sister without family or means. In 1830, Régnault won entrance to the prestigious École polytechnique. Graduating third in his class, he continued his training as an engineer at the École des Mines, where he studied with the celebrated chemist L.-J. Gay-Lussac. After his election to the Chemistry section of the Académie des sciences in 1840, Régnault turned his interest to the emerging field of experimental physics. His major research topics were patently useful to the state's plans for industrial development, and brought him lucrative government research commissions. Régnault also received multiple academic appointments, including Gay-Lussac's coveted chair in chemistry at the École polytechnique (1840), and the chair in physics at the Collège de France (1841).

Like many of his academic colleagues, Régnault was captivated by the promise of photography as a tool of empirical science. Known as a master of precise scientific method and measurement, Régnault would apply this talent to refining the inexact practices of early photography. In 1841, when William Henry Fox Talbot sent Jean-Baptiste Biot samples of his photographic paper, Biot passed them on to Régnault, who was already experimenting with daguerreotypy. Régnault soon adopted Talbot's paper negative process and in 1843, Richard Calvert Jones wrote to Talbot from Paris, telling him he had been making calotypes with Régnault and Hippolyte Bayard. Little else is known of Régnault's photographic activities prior to 1847, when Louis-Désiré Blanquart-Evrard devised improvements to the English process that circumvented Talbot's patent restriction in France. Régnault was charged with examining Blanquart-Evrard's process for the Académie in April of 1847. He subsequently became one of the most avid practitioners of paper negative photography and contributed at least fourteen images to Blanquart-Evrard's Imprimerie Photographique editions in the early 1850s.

In January of 1851, Régnault joined a diverse group of artistic, literary, and scientific figures in founding the Société héliographique, which precipitated a sudden increase in his photographic activities. Always worried that he was not devoting his full energy to his scientific career, Régnault claimed that did not take up photography for pleasure, but because he intended to illustrate a physics textbook with photographically derived illustrations, for which he invented a method of chemically reducing photographs to line drawings. This project, while never realized, may be connected with ten photographs of staged acoustic experiments Régnault made in 1851. Two substantial portrait series also date from this time: portraits of his colleagues in science and academe, and a large group of intimate portraits of his family. He also contributed two methods to the technical discouse: the use of pyrogallic acid (which quickly superceded gallic acid as the premier developing agent) and the use of a vacuum pump in uniformly sensitizing photographic paper.

In 1852, Régnault's photographic and scientific careers came together with his role as a government arts administrator when he was appointed to the prominent directorship of the state-owned Manufacture Impériale de porcelaine de Sèvres. At Sèvres, he found another devoted calotypist in Louis Robert, the head of the painting atelier, who had begun working in photography around 1850. Both men frequently photographed the factory environs in the early 1850s. Régnault also took advantage of the pastoral scenery around Sèvres to create his most artistically ambitious images: large format (approximately 35 × 44 cm), atmospheric landscapes of the Seine and woodlands around Sèvres. Several of these lush landscapes were exhibited in London in 1852 and 1853, courtesy of Régnault's friend John Stewart. These appear to have been the only public exhibitions of Régnault's work in his lifetime. His photographic practice was essentially private, notwithstanding his role as a central figure and technical expert in photographic circles of the 1850s.

Régnault accepted the presidency of the newly formed Société française de photographie (S.F.P.) in 1855. With their unanimous vote, the new society's members recognized Régnault's ability to bridge the concerns of science, art, and industry, a goal that would

be precisely served by Régnault's involvement in the highest circles of power in the Académie des sciences, Académie des beaux-arts, and the Second Empire government. With his ties to British photographers such as Sir John Herschel and Sir David Brewster, Régnault would also serve as a link between the British and French photographic worlds. His scientific expertise and faith in empirical method, moreover, made him a superior technical expert, and he duly focused his efforts for the S.F.P. on extracting rational methods and practices from the informational disorder surrounding the nascent medium. In this way, he presided over the field of European photography for nearly fifteen years, guiding discussions of technical, professional, and occasionally aesthetic concerns and serving as arbiter of all debates presented to this most influential photographic organization on the Continent.

Although he is known to have practiced wet plate photography and other process variants as they appeared in the late 1850s and 1860s, Régnault's principal photographic work was confined to his paper negative photography of the early 1850s. Increasing professional obligations and poor health curtailed his leisure photography after 1855, but he continued to serve actively as president of the S.F.P. until his resignation in 1868. Crushed by the death of his son, the celebrated painter Henri Régnault, in the Franco-Prussian War, he withdrew from public life and died in 1878, on the seventh anniversary of Henri's death.

Without exhibition reviews or other discussions of his work in the photographic press of his day, Régnault's photography was overlooked by historians until the late 1970s.

LAURIE DAHLBERG

Biography

Victor Régnault was born on 31 July 1810, in Aix-la-Chapelle, France (present-day Aachen, Germany). A devoted experimental chemist and physicist in the Académie des sciences, Régnault first experimented with daguerreotypy around 1840. Introduced to paper photography in 1841 by J.-B. Biot, who gave him samples of Talbot's sensitized paper, Régnault eventually became a serious practitioner of calotypy, which he applied to multiple purposes in the early 1850s, including scientific use, portraiture, still life, and landscape. He was a founding member of the Société héliographique in 1851, and the first president of the Société française de photographie (1855-1868). Appointed director of the state porcelain factory at Sèvres in 1852, Régnault also experimented with vitrifiable photography and convinced the state to allow photographic documentation of the Sèvres wares. A technical expert and authority, Régnault experimented with all photographic processes, but only his paper photography survives. He died in 1878.

See also: Calotype; Robert, Louis; Société héliographique; and Société française de photographie.

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REID, CHARLES (1837–1929)
Scottish

Charles Reid was born at Turriff, Aberdeenshire in 1837 and operated a photographic studio in Wishaw, North Lanarkshire.

Reid specialised in animal studies and it is for these small albumen and large carbon prints that he is known today, producing a large quantity of high-quality studies of sheep, cattle, birds, horses etc. The resulting prints are usually monogrammed C.R. and numbered in the negative. Many were printed and published by G.W. Wilson and Company.

Reid's pictures are always well composed and show good technique and many examples of his small studies were purchased by artists as reference for their paintings and sculptures. His large carbon studies of Highland cattle and sheep graced many late Victorian parlours.

Reid travelled extensively around Scotland and the North of England finding suitable animal subject matter and he showed considerable patience in working with a wide range of creatures and producing such good quality work ,which rarely shows a hint of blur. He exhibited his photographs in the 1880/90's and also gave lectures to the Edinburgh Photographic Society during this period. He published an article 'Some Notes on Animal Photography' in The Practical Photographer in 1895.

His sons continued his business well into the 20th Century.

IAN SUMNER

REJLANDER, OSCAR GUSTAV (c. 1813–1875)

Oscar Gustav Rejlander was born in Sweden. Little is known about his early years, but as a young man he studied painting on the continent, where he became familiar with the work of the old Masters, whose influence is apparent in some of his best known photographs. His career as a photographer began when he was thirty-nine, and was centered in Wolverhampton and London. Rejlander was an ingenious photographer who produced a highly diverse body of work that included portraits, genre scenes, figure studies, allegories and literary illustrations. His versatility is a reflection in part of the difficulties he and other photographers of the period encountered as they tried to earn a living from this fledgling medium.

Rejlander is most often remembered for inventing combination printing, a process in which different plates are painstakingly combined into a single, integrated image. Beyond making good exposures and prints, issues of scale and consistent lighting (and shadows) were essential in creating convincing final prints. Rejlander's successful combination prints are remarkable considering the complexity of the wet plate process, long exposure times, and fleeting lighting conditions. Combination printing required careful conceptual work of the final image, along with a good deal of skill and patience in its execution, and Rejlander's background as a painter no doubt were helpful in both regards.

Rejlander's best-known photograph, *The Two Ways of Life* (1857), was a combination print painstakingly

Rejlander, Oscar Gustave. The Madonna and Child with St. John the Baptist.
The J. Paul Getty Museum, Los Angeles

assembled from over thirty separate plates. The final print evokes after Rafael's *School of Athens,* but Rejlander's allegory had an expressly Victorian flavor, with one side representing virtuous activities like reading and tending to the sick, while the other side depicts several deadly sins. The inclusion of languorous, bare-breasted nudes provoked a fair amount of controversy when it was first shown, even though Queen Victoria found sufficient merit in *The Two Ways of Life* to purchase a copy for Prince Albert, who reportedly kept it on his wall for the rest of his life.

Many of Rejlander's other photographs are equally innovative. Rejlander grasped in prescient ways the potential of the photographic medium to capture an unfolding scene or even stop action long before such images were technically possible. In many of his genre studies he conveys a sense of spontaneity in a scene, despite the cumbersome wet collodion process and slow exposure times. In a picture like *The Juggler* (c. 1855) he constructed an effective illusion of a man juggling several decades before such images were technically possible. Rejlander's accomplishment lay in his ability to *conceive* of such images as natural extensions of photographic seeing.

Many of Rejlander's genre pictures and portraits involve children, a photographic subject that was very popular with the masses as well as photographers like Hill and Adamson, Charles Dodgson, and Julia Margaret Cameron. Here again, he experimented with various moods, ranging from depictions of angelic children (again evoking Rafael) to poor waifs who could easily populate the novels of Charles Dickens. He photographed children at play, at rest, in the nude, and at their mother's breast. His most commercially successful photography, *Jinx's Baby*, depicted a small child in the midst of a howling cry. This photograph was one of roughly eighteen pictures which Rejlander produced as illustrations for Charles Darwin's *The Expression of the Emotions in Man and Animals* (1872).

Rejlander brought a sense of humor to photography, a rarity among 19th century photographers, who were a rather somber and serious lot. Only Nadar, among Rejlander's contemporaries, expresses a comparable *joi de vivre* in his photographs. In one combination print, *O. G. Rejlander Presents O.G. Rejlander* (c. 1871), he theatrically presented himself as an alter-ego militia man. In *Happy Times*, he and his wife, both well into middle age, smiled jauntily at the camera with unmasked good humor. Rejlander depicted scampish children being chastised by cranky, outraged elders. Rejlander also enjoyed satire: in *Did She? (c. 1862)*, two men gossip and snicker about some unsuspecting young lady, while *The Empress Nicotena (c. 1857)* depicted an old and weathered crone holding a mask of youth in front of her face with one hand as she reached for tobacco with the other.

Some of Rejlander's studies convey a sense of sexuality that defy the typical Victorian stereotypes. Rejlander's approach was at times light-hearted, as in *Washing Day* (c. 1855), where a two older women washed clothes in the foreground while a younger woman hung hosiery on a line to dry while openly flirting with a young man. Some of his studies of paired, unclad women suggest lesbianism, and one light-hearted photograph featured two soldiers who flank a third man who is dressed as a woman. Masturbation was clearly implied in *The Bachelor's Dream* (c. 1860), where a sleeping man reclined beside a dress hoop populated toy female figures, his hand resting on his groin. Paintings or photographs that address issues such as these are extremely rare in Victorian England, or even on the Continent, where the underground traffic in photographic pornography was more developed.

Despite a lengthy and prolific career, which included several published essays on photography, Rejlander died impoverished and largely forgotten. The press complained about what they perceived to be shoddy technique, and others questioned some of his subject matter. Rejlander's positions on the artistic potential of photography were controversial in some quarters, and his adventuresome efforts to expand the range of photographic expression no doubt confounded some of his peers. Peter Henry Emerson's scathing review in 1890 of Rejlander's posthumous, four hundred print retrospective sealed his fate for several generations of Modernist photographers and historians.

In his published writings, Rejlander was a consistent champion of photography's legitimate role in the production of art by painters and, increasingly, photographers themselves. Like Arago and Talbot, he grasped reflexively some of the possibilities of photography, both in the ambitions of combination printing and naturalistic, "stop-action" scenes, and in his ability to achieve psychological insight in a broad variety of photographic genres.

DAVID L. JACOBS

See also: Cameron, Julia Margaret; Dodgson, Charles Lutwidge; Hill, David Octavius, and Robert Adamson; and Victoria, Queen and Albert, Prince Consort.

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RELVAS, CARLOS (1838–1894)

Carlos Augusto de Mascarenhas Relvas e Campos (1838–1894), was the best know 19th Century Portuguese amateur photographer. He was a very rich farmer and a nobleman from Ribatejo in central Portugal. His enormous wealth allowed him the time and resources for an important photography practice, including the building of the exotic and magnificent House of Photography, entirely dedicated to his photography. He was initiated in photography, using wet collodium, most likely by W. CifKa in the early 1860's. During his life he experimented with most new photographic processes: Collotype, Gum, Carbon, and Gelatin.

As an amateur he was not constrained by the limitations of a daily portrait business and embraced most of the acceptable genres of 19th Century photography: Portraits of family and friends, including the royal family, landscapes and folk types. These were many times performed by his servants and employees, he photographed in the studio, many times with painted backdrops. One of the most important parts of his work consists in art reproductions, being the photographs he made of the tomb of the King Pedro I and his mistress Inês, he made in 1868, some of the first of that genre. He also made the 52 photographs of the decorative arts exhibition in Lisbon. His photographs where part of the Fine Arts Academy in Lisbon report on northern Portugal monuments. Carlos Relvas participated in many exhibitions in Portugal and abroad, including the Paris Universal Exhibition in 1876, and the Vienna Universal Exhibition were he won prizes.

In 1884 organizers of the Portuguese first national photography exhibition invited him has an honorary president and only after his refusal turned to the king Ferdinand. He died in 1894, after a horse accident.

Due to family quarrels most of his negatives were sold after his dead and many were lost. Even so a large amount of then are in Portuguese national institutions and a major exhibition was held in 2003 in Lisbon's Ancient Art Museum.

Nuno de Avelar Pinheiro

Exhibitions

Carlos Relvas e a Casa da Fotografia, Museu Nacional de Arte Antiga, Lisbon, 2003.

Renjø, Shimooka; See Shimooka Renjø.

RETOUCHING

The retouching of photographs was a habitual and extensive practice. The aesthetics and practices of retouching can be separated into two broad periods. The first is from the early 1850s to the early 1860s. The second is from the 1870s onwards to the end of the century. Separating the two phases are differences in the practical process of retouching, and its impact upon perceptions of photography.

The reworking of photographs was a prominent concern as early as the 1857 Art Treasures exhibition. During the 1850s, retouching was a term covering various forms of manipulation, including colouring. Of the 240 portraits exhibited in Manchester, a large number had been altered. A review in the *Liverpool and Manchester Photographic Journal* drew attention to both the number of touched photographs and the extent of their alteration. It noted that, in some cases, "no trace of the original picture is visible, its only use apparently being to secure identity and truth, the visible picture being laid over the other in oil and water-colour" ("Exhibition of Art Treasures at Manchester," 126). At this stage, most manipulation would have been carried out on the positive print rather than on the glass-plate negative.

Coloured photographs were intended to alleviate the unflattering and mechanical harshness of the monochrome picture. The practice thereby made the resultant pictures more akin in appearance and status to miniature portraits. As such, colouring reflects photography's initial subservience to the dominance of fine art aesthetics. In 1862, the *London Review* claimed that coloured photographs approached more closely to oil paintings because they were the result of study and generalisation, which were qualities lacking in an ordinary photograph. On a more pragmatic level, miniature painters put out of business by photography found themselves employed by photographic studios. In 1857, Elizabeth Eastlake claimed that there was no photographic establishment that did not employ artists for finishing pictures, at salaries of up to £1 a day.

In order to counter the hybridity of coloured pictures, there were numerous claims that the realism of photography was its unique element. Manipulation of photographs was felt to undermine the most valuable quality of the medium. Efforts were consequently made by the Photographic Society of London to prevent any retouched photographs being shown at their annual exhibition. The rules of entrance for the 1857 exhibition at South Kensington, for example, included precise instructions regarding retouched photographs. They would be admitted only if accompanied by untouched copies of the same picture. Positive pictures from touched or painted negatives also had to be described accordingly. These instructions continued to be repeated but judging by the complaints of some reviewers they were far from being universally followed. In 1864, the Photographic Society of London debarred from their annual exhibition any coloured or touched pictures. Although the effect was a much reduced exhibition, the rules did enforce

Southworth, Albert Sands and Josiah Johnson Hawes. Lemuel Shaw. *The Metropolitan Museum of Art, Gift of Edward S. Hawes, Alice Mary Hawes, and Marion Augusta Hawes, 1938 (38.34) Image © The Metropolitan Museum of Art.*

a pure photographic aesthetic where there was a clear demarcation between "real" and fabricated pictures.

Despite the efforts of some members of the photographic community, retouching, and debates upon its efficacy and honesty, were commonplace during the 1850s and 1860s. In the *carte-de-visite* era, methods could be as crude as the retouching of eyes by putting pinpricks in the negative. During the 1870s and 1880s, retouching continued to be prevalent. This second phase of retouching differed from the early years of photography though in that the dominant means of manipulation was through working upon the negative rather than painting upon the positive print. Photographic manipulation became particularly common after the introduction of the dry-plate negative in the early 1870s because these were easier to rework than the existing wet-plate negatives.

In addition the technical ease with which retouching could now be carried out, the introduction of a larger format of cabinet photograph presented a greater threat to a sitter's vanity. Any blemishes or wrinkles were more likely to be evident. The value of producing of flattering pictures certainly encouraged the widespread use of retouching. As the *Photographic News* put it in 1872, photographers knew that "those portraitists who retouch most effectively secure the largest share of public patronage" ("Retouching and Photographic Truth" 25). An equally important reason for the practice, however, was the removal of technical imperfections

and the desire for greater realism. The amount of light used by photographic studios, for example, considerably deepened any wrinkles and accentuated the signs of age: retouching was argued to be a means of making a photograph into a better likeness.

The specialist photographic journals often contained advice on how to manipulate negatives, and there were numerous instruction manuals published. These suggest that, at its best, retouching was a complex practice that required a high degree of artistic skill and an intimate knowledge of facial physiognomy. All too easily, however, zealous retouching could give sitters' faces a waxdoll or billiard ball appearance. Many articles on retouching, although not against the practise *per se*, were concerned that too much unskilled work would destroy popular belief in photographic realism. As one manual put it, "The clever pupil of the celebrated Professor Scratchpaw took in other pupils until the scratchpaw aborigines flooded the market with *re* or *misre*-presentations of somebody or other, and the result was that the real retoucher has always been at a premium" (Hubert, 7–8).

Retouching was carried out using a variety of soft lead pencils upon a glass negative coated with a solution that allowed the pencil to bite. Elaborate professional equipment, including desks with inbuilt lights and reflectors, aided the task. Most manuals recommended the use of lines to accomplish any desired alterations, much in the way a steel or wood engraver would work. Retouching varied from the carefully precise work to the brutally extensive. As *The Art of Retouching* put it:

> Do not on any account forget to touch ladies' waists in a specially hearty matter, if you want to keep on good terms with them. You are always safe in cutting off an inch on each side, and in some cases, where corpulence is rather conspicuous, two or more inches will never be missed. (Hubert 49)

Instruction manuals contained far more information, however, than simply the removal of waistlines and double chins. They included details of how to soften the lines around the temples; how to remodel the furrows around and under the eyes where the studio light would cause dark shadows; and how to thicken and darken hair through careful manipulation. Necks, cheeks, jowls, all were subject to the retoucher's pencil. Carried out with skill and subtlety, retouching could add *gravitas* to a sitter's appearance as well as remove years.

JOHN PLUNKETT

See also: Rigby, Lady Elizabeth Eastlake; Photographic Exchange Club and Photographic Society Club, London; Cartes-de-Visite; and Photographic News (1858-1908).

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REUTLINGER, CHARLES (1816–1881)

French photographer

Charles Reutlinger was founder of the highly successful eponymous Paris photographic establishment, in business from 1850 to 1937, which was known for its portraits, theatrical cartes de visite and cabinet cards, as well as erotica and, later, fashion and proto-surrealist photographs.

By the time Reutlinger was 18, he was already known to be practicing the art of silhouette portraiture, which his aunt, Madame la Conseiller Weiss, had been doing professionally since around 1820 in Karslrhue. He moved to Stuttgart around 1835, where he met Georg Friedrich Brandseph, an established silhouette artist, who was among the early adapters to the burgeoning field of daguerreotype portraiture. It may have been Brandseph who interested Reutlinger in the new art, but it is undoubtedly during that time that Reutlinger came to know about the work of Daguerre and Niepce, and he established his own photographic studio in Stuttgart at 8 Fürtbachstrasse by 1849.

Reutlinger certainly arrived in Paris with some amount of portrait photography business and technical acumen already, since, by 1851, his photographic advertisement was running in the publication *La Lumière*, offering, as well, to instruct others in the art of "daguerreotype on paper."

From the early 1850s, Reutlinger was a prolific producer of carte de visite portraits of the notable figures in cosmopolitan Paris, including politicians and royalty, musical celebrities, and theatrical stars. Among the portraits in the collection of the Bibliothèque Nationale are the Le Prince Napoléon-Bonaparte (ca. 1853) and Édouard Manet (1875). His atelier was decorated

elaborately, with the furnishings and decor serving as settings and props in the portraits. The cartes were stamped "Ch. Reutlinger" on the back, with a coat of arms and address, and sometimes "garantie d'après nature."

Portrait photography was an ideal symbiotic partner with the emerging cult of celebrity, especially the fascination with theatrical stars. Both were dependent on artifice and capitalized on fantasy, and photographers and performers were glad to cooperate to increase their profits.

Reutlinger's early style was somewhat distinctively archaic, in that it drew upon the formal conventions of the silhouette portraits by preferring to vignette bust portraits, rather than the full length portraits preferred by Disderi and other contemporaries.

The medium for Reutlinger's commercial production, the carte de visite, was a photographic process patented in Paris by André Disderi in 1854. They were albumen prints printed onto cards of standard sizes (4½ × 2½ in.), which had engraved labels on the back with the company's name, address and coat of arms. In the 1860s, a larger format (6¾ × 4½ in.) was introduced, the cabinet card, which replaced the bulk of Reutlinger's production for the remainder of the century, until supplanted by less expensive postcards.

Reutlinger became a member of the Société française de photographie in 1862, and his more beaux arts photographic works were included in their exhibitions throughout the 1860s and 1870s. The works shown were predominantly artistic portraits and studies "after nature," in keeping with the academic aspirations of that organization. In the 1874 exhibition Reutlinger exhibited six examples of what were labeled "aristotypes (silver gelatin prints)," and in 1876, a series of carbon prints.

Meanwhile, the increasing commercial demand for celebrity portraits was a boon to Reutlinger, who had, by 1873, a catalog of over 1,300 personalities available for sale. Their names, listed alphabetically and by genre or profession, were predominantly those of public figures and theatre stars, but also included members of the clergy (Catholic, Jewish and Protestant), visiting dignitaries, and great artists.

Reutlinger was by no means alone in capitalizing on the demand for theatrical stars, as his colleagues Nadar, Etienne Carjat, and others were highly successful in that regard. The great democratization of these images, available for a small price, allowed the public to select and repeatedly examine the likenesses of the famous. These, they mounted into albums, becoming, in effect, curators of their gallery of favorite portraits. Émile Zola's novel *La Curée* gives an indication of the entertainment value these provided, provoking passionate discussions by the collectors about the various merits and depictions of the personalities in their personal albums.

Ten albumen prints of his theatrical portraits were included in a 1875 publication by the Palais Royal-based firm Tresse titled *Foyers et Coulisses: Histoire Anecdotique des Théatres de Paris*. Many magazines also patronized Reutlinger and the other Paris firms for iconic images of everyone from statesmen to *demi-mondaines*, with a decided preference for the latter.

The costumed actresses, by far the most popular of the images produced in that era, naturally evolved into more and more erotic imagery, with an emphasis on actresses in the body stockings that were the theatrical facsimiles for nudity. This, in turn, gave way to Reutlinger photographing nudes and beauties in their underclothes, and making them available as a series called "des petites femmes de Paris." The fact that this was a thriving industry initially particular to Paris during the period is evident by the fact that erotic pictures continued to be referred to as "French postcards" well into the 20th century.

It is not clear how many of these nudes were made by Charles and how many were by his younger brother, Émile, who succeeded him as director of the business in 1880. It is certainly known that the catalog of existing images continued to be marketed and added to in Émile's era, and that Charles Reutlinger passed away in Paris in 1881.

The Reutlinger firm continued well into the twentieth century under a succession of family members, but the cartes continued to be stamped "Ch. Reutlinger" until 1895, when the stylized signature of Léopold, the son of Émile, became the label. Today, the bulk of the Reutlinger archives are housed in the Bibliothèque Nationale de France in Paris.

Reutlinger's legacy was as a pioneer in the commercial business of photography and creating a niche business in the great photographic metropolis that was Paris in the 30 years he was active there, recognizing and cultivating the uncharted territory of celebrity mania, then in its formative years.

DEIRDRE DONOHUE

Biography

Reutlinger was born 26 February 1816 in Karlsruhe as Carl Reutlinger, the eldest of four siblings. His brother Émile, who would succeed him as head of the firm, was born in 1825. Their father Léopold was a wine wholesaler and former military officer.

In 1850, upon moving to Paris, he changed his first name to Charles, and began to work in his home at 33 boulevard Saint-Martin (in a building which no longer exists). Charles Reutlinger, photographic artist, appears in the Bottin Paris business directory of 1853 at 112 rue de Richlieu on the corner of boulevard Montmarte. That is the address of the firm until 1864, when the

street number for the entrance around the corner, on the boulevard, is given.

Reutlinger's first award, a medal of London, was not noted on the backs of his photos, but he won a succession of honors during the next two decades, including first prize medals in the *Exposition internationale de Berlin*, 1865; the *Exposition universelle de Paris*, 1867; the *Exposition photographique de Hambourg*, 1868; and medals from the *Société Photographique à Paris*, 1870; the *Exposition universelle de Lyon*, 1872 and the *Exposition universelle de Vienne*, 1876. These medals were reproduced on the backs of the firm's cartes.

See also: Cartes-de-Visite; Cabinet Cards; Daguerre, Louis-Jacques-Mandé; Bonaparte, Roland, Prince; Zola, Emile; Nadar (Gaspard-Félix Tournachon); and Carjat, Etienne.

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REY, GUIDO (1861–1935)
Italian photographer

Guido Rey was born in Torino in 1861, to Giacomo Rey and Lydia Mongenet de Resencourt. In 1879 he attended the Academy of Fine Arts in Torino. He worked in the family textile business for which he traveled quite often. He took his first photographs during mountain climbs in 1883–85 with the Sella family and started his pictorialist works only in 1892–93. He was active in organizing the Universal Exposition of Visual Arts in 1902 where Stieglitz, Demachy, C. White and Annan presented their works. He died in 1935.

Rey participated in the cultural life of his city but more importantly in the debate—at the European level—about photography as an art. He had a great passion for painting and he was the only European pictorialist to create sets with minute historical attention in Nipponic, Roman, Flemish and Neoclassic style, without manipulating the photographs. His intent was to describe the past in the every day scenes by having his models wear costumes that he designed. His book on alpinism was published in 1904 (*Il monte Cervino*). More appreciated abroad, his work was published on "The Studio" review and he was the only Italian to be published on "Camera Work" (1908).

CARLO BENINI

Rey, Guido. Dutch Interior.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

REYNAUD, CHARLES-EMILE (1844–1918)
French inventor, artist, showman

Charles-Emile Reynaud was born at Montreuil-sous-Bois on December 8, 1844. An experienced creator of educational images for the magic lantern, in 1877 Emile Reynaud invented the Praxinoscope. This ingenious moving image toy featured a central circle of mirrors set in a shallow cylinder, opposite colour-lithographed sequence drawings on paper strips. The Praxinoscope Theatre followed; the cylinder set in a box with glass-covered viewing aperture, which reflected a card with a colored background. The animated subjects appeared superimposed on the scenery. A further development for projection, the domestic Projection Praxinoscope, used figures on glass. This led to the Théâtre Optique, a large-screen version. Long perforated bands, bearing characters painted onto squares of transparent material, were wound horizontally back and forth from reel to reel in the mirror-drum projector. The background was projected from a separate lantern. Shows commenced at the Musée Grevin, Paris, in 1892. By 1896 Reynaud was shooting photographic motion picture

films; subjects included clowns Footit and Chocolat. The individual film frames were mounted as perforated bands in the same manner as the painted strips. These presentations were eventually superseded by competing cinematograph shows; the last performance was in 1900. Between 1903 and 1907 Reynaud worked on a motion picture viewer for brief stereoscopic sequences. Emile Reynaud died at Ivry-sur-Seine, January 9, 1918.

STEPHEN HERBERT

RICHEBOURG, PIERRE AMBROISE (1810–1872)

Pierre Ambroise Richebourg was born in Paris in November 1810. Of his childhood and his formation few elements are known, except that he was trained in optics with Vincent Chevalier, father of Charles Chevalier, supplier of instruments of Daguerre. He seemed to have followed the lessons of the latter, of whom he created a portrait with daguerreotype in about 1844.

He was one of the first to exhibit daguerreotype portraits in Paris in late 1839. He was also, according to his own statements, the first to have carried out a series of daguerreotype images taken under the solar microscope for the course of Alfred Donné at the College of France, in 1840, from which he presented examples in front of the Academy of Science in Paris. The following year, following the death of Vincent Knight, he again took up Knight's trade and installed his shop and workshop not far from the Town hall, at 69 quai de l'Horloge (which will become, following a change of classification in 1851, number 29) where he made photographic portraits, sold photographic material, and gave lessons. In 1843, he published an instruction manual, *Nouveau manuel complémentaire pour l'usage pratique du daguerréotype* [the New Complementary Handbook for the Practical Use of the Daguerreotype]. The following year, his name appeared under the heading "daguerreotypist" and he presented in the "optical" section of the images at the exposure of the l'exposition des Produits de l'Industrie, where he received a favorable acknowledgement of the panel.

From the very beginning of the 1850s, he was one of the first French photographers to be interested in the new technique of the collodion, for which he developed, about 1851–52, a protective varnish for the negative plates. From this date he used this technique, to which he devoted a booklet in 1853, *New Handbook of Photography on Collodion*, in which he carried out the essence of his production. During the years 1850-1860, he entered many exhibitions, Paris (1855 (medal), 57 (medal), 59, 62 (medal), 64, 65, 67), Brussels (56, 57), London (58, 63), and Oporto (66). In 1855, he became a member of the Société française de photographie. Ten years afterwards, indicative of his fame, he appeared in the *Dictionnaire des Contemporains* of Vapereau.

His abundant production, often of excellent technical quality with some exceptions, is worthy primarily due to the diversity of the addressed subjects, characteristic of the multitude of the fields of applications of photography under the second Empire. The various mentions of the photographer one finds on the seals and publications are indicative of this eclecticism. In the years 1860, his name in organizations was frequently followed by the description " Photographe des Palais Nationaux " then, from 1864 as "Photographe de la Couronne." In 1858, he was described as a "photographer of the contests, the official albums, and the artists" and since 1864, as a "the photographer of Town hall" and "photographer of the Ministry for the Art schools."

One of his fields of interest was the reproduction of works and objets d'art, which he explicitly mentioned as one of his specialties since 1847–48. It is known that he made reproductions for various artists, painters (Billhook, Leroux), sculptors (Préault), and goldsmiths (Wheat-Meurice). He also made photographic copies of the paintings in the Salon, in particular those of 1857, 1861, and 1865. The work of Theophilus Gautier appeared at Gide and Baudry in 1859, *Trésors d'Art de la Russie ancienne et moderne*, decorated with sixty photographs chosen from more than two hundred created by Richebourg in Russia since 1857.

On this occasion he developed a system that enabled him to reproduce images of a whole cupola with a high geometrical degree of accuracy. With this production a certain number of remarkable series devoted to the interiors of various palaces and imperial residences were added: the castle of Fontainebleau (about 1860), the palace of Luxembourg (about 1859), that of the Elysium (1864), the Pompéienne Villa of Prince Napoleon (about 1865).

Parallel to this activity Richebourg expressed a taste for what one can describe as topical photography. Introduced in the mid-1850s, in the imperial milieu, he successively photographed the reception of Queen Victoria at the Town hall of Paris (1855), which he reproduced, for the people of Paris. He then documented the ceremonies of the birth and baptism of the Prince Impérial (1856), and the festivals of Cherbourg (1858). During this period Richebourg announced that on request he would travel around France. It is likely that a number of engravings made from his photographs and used in *L'Illustration*, emanate from such commissions. This continued until the beginning of the 1870s, through the series made by Richebourg containing images of various inaugurations (le palais du Luxembourg (1858), the chantier de l'église saint (1861), Arc de Triomphe de l'actuelle place de la Nation. In 1871, he created some

pictures during and after the events of the Commune, some of which were again interpreted in engravings.

A commercial portraitist, he was also interested from the early 1850s in passport photos and identity cards, and in January 1853 establsihed a program for passports with photographs in front of the ministry for Justice. Thereafter he seemed to have worked sporadically for the Prefecture of Police force: in 1869, in particular, he made and marketed negatives of the victims of the Troppmann assassin. In addition, as a photographer on behalf of the Ministry for Agriculture and the Trade, he regularly created images of the animals of the annual agricultural shows of Poissy, Paris, and Chartres. Several of these images were presented at the time of the various expositions in which it took part. He also left stereoscopic images, in particular some daguerreotypes of nude females. The last mention that one finds of Richebourg dates to 1872, in *Moniteur de la Photographie*. One does not know with certainty his date of death. His abundant body of work is found in public collections in France and abroad.

QUENTIN BAJAC

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RIGBY, LADY ELIZABETH EASTLAKE (1809–1893)

English artist, writer, and critic

Elizabeth Rigby, Lady Eastlake was born in Norwich on November 17th 1809, daughter of the obstetrician and gentleman farmer, Dr. Edward Rigby. After spending extended periods of time abroad in Germany and Estonia she settled in Edinburgh between 1842 and 1849, where her tenancy of the city coincided almost exactly with the photographic partnership of Hill and Adamson. In Edinburgh, she became one of Hill and Adamson's early and most frequent sitters, sitting for about twenty portraits. She married Charles Lock Eastlake in 1849 and moved to London where she continued to publish reviews for the periodical press, mainly in the area of the visual arts and to translate and edit art-historical texts. She died at her London home in 1893.

Elizabeth Rigby sat for her first calotype portraits in Hill and Adamson's studio in the summer of 1843 and formed opinions of the process to which she remained faithful throughout her life. She expressed her thoughts on photography to her friend John Murray, publisher of the *Quarterly Review*, soon after this first sitting: '… I venture to send you a few specimens, being assured that you will appreciate their truth and beauty, though few do. It appears to me that this is the only line of photographic drawing which can at all assist an artist—it was absurd to think that any would supersede him. I send you various specimens of the subjects to which it has been turned here … I have enclosed three of myself, not the best impressions … I *admire* myself very much, but cannot get the world to agree with me. The downcast eyes were a necessary consequence of the most brilliant sun which prevented their being raised the least higher. With old faces it is most successful—producing the most exquisite Rembrandt effect. …'

Fourteen years later, in April 1857, Eastlake wrote one of the earliest critiques on photography, an article in the *Quarterly Review* reviewing seven related publications. In large part the piece is a history of photography distilling the information from the listed texts into a reliable, chronologically arranged account of the development of the processes collectively contributing to a history of photography. Eastlake gives a lucid account of the various chemical experiments in photography up to 1857, 'when the scientific processes on which the practice depends are brought to such perfection that, short of the coveted attainment of colour, no great improvement can be further expected.' (459) The more discursive portions of Eastlake's essay articulates mid nineteenth-century debates about the status and rôle of photography. Granting 'Photography' the upper case and making it a feminine noun, like Art and Nature, Eastlake proceeds to measure the artistic successes and shortcomings of the photographic process in conveying nature. She first draws and then preserves a distinction between photography as an art and photography as a popular past time, the latter owing more to 'the hunger for facts.' She is thus untroubled by claims that photography will supersede art or supplant the work of artists, convinced that 'Photography is intended to supersede much that art has hitherto done, but only that which it was both a misappropriation and a deterioration of Art to do' (466). She therefore views photography as a means of relieving the artist of a 'burden' of 'literal, unreasoning imitation' (466), arguing that 'what she [photography] does best is beneath the doing of a real artist at all' (467).

Eastlake was herself an amateur artist, skilled in drawing portraits of friends and family and adept at producing topographical views of cities and landscape [4]. Eastlake sees photography as another form of drawing, 'the solar pencil' (445), capable of communicating

an objective account of appearances although, in her opinion, somewhat limited in its formal properties. She is most critical of photography in respect of its deadening effect on form and failure to represent the full tonal range of its subject, what she refers to as 'the falling off of artistic effect' (462). She observes: 'If the cheek be very brilliant in colour, it is as often as not represented by a dark stain. If the eye be blue, it turns out as colourless as water; if the hair be golden or red, it looks as if it had been dyed, if very glossy it is cut up into lines of light as big as ropes' (461) In landscape too, she finds that photography fails to properly convey the 'breadth and gradations of nature': 'The finest lawn turns out but a gloomy funeral-pall … trees, if done with the slower paper process, are black, and from the movement, uncertain webs against the white sky.' (463).

Eastlake's essay appeared in the wake of the wet-collodion process and she is ambivalent about the fine detailing that the process afforded. Eastlake acknowledges the 'pictorial feats' achieved by wet-collodion, for example in its precise rendition of 'Alpine masses' but she retains an aesthetic preference for the soft papers and gentler outlines of the calotype, setting up an opposition between the former's assertion of 'facts' and the latter's facility for the picturesque. The picturesque is an important and recurring motif in Eastlake's essay, used specifically to mean the opposite of descriptive. She presents picturesque conventions such as imprecise outline, broad suggestion and pleasing irregularity in the representation of nature as a benchmark of artistic practice, stating: 'If the photograph in its early and imperfect scientific state was more consonant to our feelings for art, it is because, as far as it went, it was more true to our experience of Nature. Mere broad light and shade, with the correctness of general forms and absence of all convention, will, when nothing further is attempted, give artistic pleasure of a very high kind; it is only when greater precision and detail are superadded that the eye misses the further truths which should accompany the further finish.'(p. 460) It is not only the fine detailing that Eastlake finds objectionable in the improved 'scientific state.' She also laments the lack of 'mystery' in the wet collodion print and she sees portraiture as its chief casualty: 'Every button is seen—piles of stratified flounces in most accurate drawing are there,—what was at first only suggestion is now all careful making out,—but the likeness to Rembrandt and Reynolds is gone! (p.461) Her repeated references to Rembrandt in the essay reiterate her preferences for the picturesque, where character studies are suggested rather than the descriptive where physiognomy is minutely told.

In reading Lady Eastlake's *Quarterly* review her connection to both the Royal Academy (her husband was its President) and to the Photographic Society (her husband had been its chair) should be borne in mind. It is quite plausible that Eastlake's essay was as much an iteration of Victorian academicism as it was a critique of photography. In her comparison of the 'free-will of the intelligent being' to the 'obedience of the machine' she is ostensibly distinguishing between the artist and the camera but she may equally well be referring to the very contemporary fashion for Pre-Raphaelitism. Knowing that Eastlake frequently used the *Quarterly Review* to settle old scores it is quite possible to read her reference to the artist's '… power of selection and rejection, the living application of that language which lies dead in his paint-box' (466) as a further public rejection of the strictures of John Ruskin.

JULIE SHELDON

See also: Hill, David Octavius, and Robert Adamson; Eastlake, Charles Lock; Calotype; Wet-collodion; and Ruskin, John.

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RIIS, JACOB AUGUST (1848–1914)
Dannish photographer

There are not many examples of photography changing societies perception so as to render significant social and political change, indeed some would argue that photojournalism simply sells newspapers. One exception would be Jacob Riis, (born Ribe, Denmark, emigrated to USA 1870) who used photography to provide evidence of the appalling conditions of the slums of New York City which he photographed in the 1880s for 10 years, often at night, and with an early use of magnesium powder, culminating in the most famous of his books, the first of its kind: *How the Other Half Lives* (1890). Packed 522 to the acre of mainly immigrants, New York had the worst disease ridden slums in the world. In 1877 Riis became a police reporter for the *New York Tribune* but found that his words, and indeed the printed woodblock illustrations made from his photographs, had little impact. But as a result of publishing his night photographs, the flop houses and police '5 cents a spot' lodgings were abolished and a new era of treating the poor and homeless began in the USA with Riis at the forefront of the campaign. Known as the 'Emancipa-

tor of the Slums,' esteemed by Theodore Roosevelt, Riis proved that photography could be an active agent of change. "I had a use for it, and beyond that I never went" became the touch stone for many a campaigning documentary photographer thereafter.

ALISTAIR CRAWFORD

RIVE, ROBERTO (active 1860s–1880s)
Italian photographer and studio owner

Roberto Rive worked as a photographer in Naples from the beginning of the 1860s, with a studio in Palazzo Serracapriola, Vico Carminello, 38, Riviera di Chiaja. In 1865 he moved to Palazzo Lieti, Via Toledo, 317 and, from 1886 until 1889, he had a studio in Salita San Filippo, Riviera di Chiaja, 15. In 1867 Rive took part at the Exposition Universelle Paris. He became very well-known for his portraits and views, some of which were in stereoscopic size. He took photographs of all the famous monuments in the South of Italy, in Naples, Pompeii, Paestum, Sorrento, Capri, Amalfi, and of the most important towns and archaeological sites in Sicily, as well as other historical towns such as Florence, Pisa, Siena, Rome, Genoa and Venice. He was also an inventor and he patented a special photosensitive paper which was used above all in Southern Italy. Outstanding photographers, such as Luigi Borlinetto (1827–1904), who was a very well—known scientist in Padua, used the paper invented by Rive (Borlinetto used it in a variant form, with the addition of potato flour, water and alcohol). Roberto Rive continued to practise as a photographer until the end of the 1880s.

SILVIA PAOLI

RIVIÈRE, HENRI (1864–1951)
French

Benjamin Jean Pierre Henri Rivière is primarily known as a printmaker. He was also an engraver, theatre director, collector, painter, and writer, and in the late twentieth century his skill in photography was acknowledged. Rivière did not sign or mark his photographs. Yet despite the obscurity surrounding his photographic work, photography was integral to Rivière's oeuvre. The main collection in the public realm at the Musée d'Orsay, Paris reveals that Rivière was one of the most original amateur photographers in France at the end of the nineteenth century.

Born in Montmartre, Paris in 1864, Henri Rivière grew up in this artistic milieu, spending summers with in Aix-les-Bains in the Pyrenees where he experimented with watercolour and studied nature. These trips, along with early travels to St Briac in Brittany where he would return again and again, shaped his art. Rivière was taken on by an academic and art teacher, Emile 'Père' Bin, a period of formal training lasting only a year due to Bin's unforeseen death.

Rivière was inspired by the pull of modernity, engrossed in the journal *La Vie Moderne*, and the work of Puvis de Chavannes and the Symbolists, the Impressionists, the Nabis and other contemporary artists. He was to be self-taught for the rest of his life, and generally progressed through solid periods of time using a particular medium. He produced etchings from 1881 to 1885 and then again in 1906; photographs largely from 1887 to 1912; large format wood engravings from 1890 to 1894 and watercolours from 1910 to 1950. He was to be both respected and criticised for making large format prints in large editions, which were controversially destined as much for the wall as for the collector's portfolio.

Rivière leapt adeptly into the Paris art scene of the 1880s, strengthening friendships with his childhood friend Paul Signac and other artists, including the painter and entertainer Rudolphe Salis, who ran a cabaret, the Chat Noir. The cabaret was a hotbed of political mockery, creative fervour and fun, and as a result was very popular with avant-garde artists. In 1882, Rivière became the assistant secretary of the associated journal, *Chat Noir*. At this time he began to make etchings of the countryside from the sketches he had made in Brittany.

The Chat Noir produced spontaneous plays using shadow puppets. Rivière, realising how popular it was, formalised the production. By 1886 until the end in 1896 when Salis died, Rivière was stage director of these unique performances, 43 in all, that pre-empted cinema in their screen-like movement and light effects. Rivière cut characters and images out of zinc, and created a sense of perspective in the design. In 1890 he introduced coloured lights to simulate day and night in his production of *La Marche à l'Etoile.* He documented his work at the Chat Noir with photographs, encouraged by his friend there, Charles Clos. Many of these images are of his colleagues at work, taken close-up from a range of perspectives, and often obscured by flash or the surreal floating effect of electric lights. The photographs never accompanied articles about the Shadow Theatre—George Redon's illustrations were commissioned for magazines. Rivière used his images to help him when designing new sets and to record the complicated machinery involved. His photographs sometimes preceded/inspired a theatrical story, such as his 1887 show, "La Tentation de St Antoine."

Rivière began to teach himself photography from 1887 and practised it for about twenty-five years, by which time photography was over popular in his eyes. He used a wooden camera with bellows and a (printing) frame, identical to the one Degas was to use a few years later. His glass plates were far larger than the film

negatives used by Bonnard and other artists. He was a skilled technician, mastering the cyanotype for images with shadows requiring contrast and the gelatin-silver print on matt paper to achieve luminous greys.

The Chat Noir photographs reveal Rivière's fin-de-siècle fascination with light, shade and silhouettes. Rivière described the lantern of the theatre as "the soul of the retreat," in an article in *Le Temps*, 1894, underlining the importance of light in his work and explaining in part his attraction to photography. These images fit a time when photographers such as his acquaintance Edgar Degas was experimenting with the effects of artificial light, reversing shades of light and dark. The abstract compositions and unusual perspectives pre-empt the later works of the Bauhaus photographer Laszlo Moholy-Nagy and modernists Ilse Bing and Man Ray.

Alongside the Chat Noir photographs, Rivière photographed other motifs that he used in his engravings. He focused on modern scenes of Paris around 1889, echoing Impressionist paintings of street life, with peoples' heads or feet cropped and shadows protruding into the frame from all corners. He concentrated on intimate scenes of family life in the 1890s, and his photographic portraits reveal silhouettes reminiscent of his shadow theatre days, and a fluid style recalling Degas' pastel outlines. Rivière focused on Breton ports and countryside from 1885 to 1900 and then miscellaneous subjects for the next twelve years. He covered topics beyond the pictorialist visions of outdoor nature in his prints, and used photography to record personal portraits and interior views of his home, restricted, or inspired, by the space and light in the apartment. By 1886 he and his wife Eugenie had a summer house in Loguivy, Brittany, and a large Parisian apartment on the Boulevard de Clichy.

Rivière combined classical, modern and decorative styles to produce elegant compositions, heavily influenced by the Japonaism popular at the time. Although Rivière was opposed to overt stylisation in art and examined nature fervently, his wood block prints reveal stylistic techniques from Japanese artworks—high perspective, unusual crops and large flat expanses of colour. Amassing one of the largest collections of oriental objects in nineteenth-century Paris, Rivière became close friends with a dealer, Florine Epstein-Langweil, and worked with his patron Tadamasa Hayashi, who imported Japanese woodblock prints to France.

His photographs of Paris reveal the modernist steep perspectives and sharp angles, stemming from Japanese influences. From 1899 Rivière used photographs and sketches to document the building of the Eiffel tower. He used these preliminary studies for a set of woodblock prints, after Hokusai, *Les Trente-Six Vues de la Tour Eiffel,* published as lithographs in 1902. He was the first person to image the Eiffel Tower and both his photographs and his resulting prints present radical abstract views. The prints were well received, Roger Marx writing in the *Revue Encyclopedique* ten years later that since producing them, Rivere 'has a cult of admiration long overdue' (Toudouze, 135).

Although Rivière did not intend his photographs to be "art," today they have been lifted from obscurity. Technically competent and aesthetically daring, Rivière's photographs bare witness to the nineteenth-century fascination with the effects of light and shade, steep perspectives and modern scenes and are both documentary and artistic. They pre-empt the modernist movement that gripped Paris in the 1920s and '30s and despite the self-effacing nature of the artist, are important proof of the fast pace of nineteenth-century Paris and the changing role of photography.

SOPHIE LEIGHTON

Biography

Benjamin Jean Pierre Henri Rivière was born in Montmartre, Paris, in 1864. He spent much time in Brittany and Aix-les-Thermes, in the Pyrennes. His father died in 1873 and his mother remarried in 1875. A friend of his step-father, Emile "Père" Bin, academic painter and teacher, accepts Henri Rivière into his studio in. Rivière met Rudolpe Salis in 1882 and discovered the Chat Noir, an artistic cabaret. From 1886 to 1896 Rivière ran the Shadow Theatre at the Chat Noir. He participated in his first exhibition in 1886, of works by Chat Noir artists. He met Eugenie Estelle Ley in 1888 and they married in 1895. In 1888 Rivière taught himself to make woodblock prints. From 1888–1902 Rivière worked on a series of lithographs of the Eiffel tower. Andre Antoine, friend of Rivière, formed the Theatre Libre and in 1888 commissioned Rivière to produce a program, co-produced with Eugene Verneau, a commercial lithographic printer who collaborated with Rivière on prints. In 1896 the Rivières bought a summer house in Loguivy, Brittany. Rivière produced his first major lithograph edition *L'Hiver* in 1896 and continued with engraving, photography and watercolour painting. His wife died in 1943. Rivière died in 1951, aged 87.

See also: Artificial Lighting; Degas, Edgar; France; Impressionistic Photography; and Societies, groups, institutions, and exhibitions in France.

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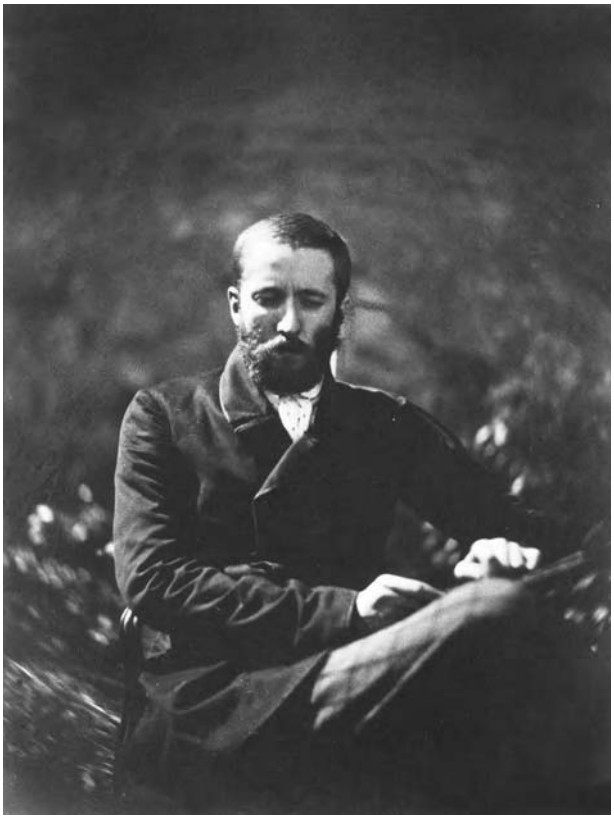
ROBERT, LOUIS RÉMY (1810-1882)
French photographer

Louis Rémy Robert was born in Paris on 3 October 1810, the eldest child of two artists, Pierre Rémy Robert and Anne Caroline Demarne. In 1813, Pierre Robert moved his young family to Sèvres, where his father-in-law, Jean-Louis de Marnette Demarne, a Belgian landscape painter, had secured him a job at the Manufacture Nationale de porcelaine de Sèvres. As a boy, Louis Robert assisted in his father in the *atelier de peinture sur verre* (glass painting studio) and was groomed to take a permanent place at Sèvres, but the Robert family intended that Louis would be more than an artist or artisan. Following his secondary studies, Robert studied chemistry with the illustrious chemist Jean-Baptiste Dumas, probably at the École centrale des arts et manufactures, a new school of industrial engineering in Paris. When his father died suddenly in 1832, Robert returned to Sèvres to assume the role of family breadwinner, and he ultimately spent the rest of his life at the manufacture in a series of increasingly important positions. With commissions for stained glass windows waning in the 1840s, the glass painting studio was phased out, and Robert ascended to the post of *chef de peinture* in 1847. In 1871, Robert became the first employee from the factory ranks to attain the position of Director of the Manufacture de Sèvres.

Robert began experimenting with photography around 1850. Material conditions made the Sèvres factory a natural place for photography to appear, where there were laboratories, chemical stocks, and the camera obscura already in use. Technical advice would have been available from Robert's former professor J.-B. Dumas, who also happened to be an early photographic expert living in Sèvres. In some early trials, Robert utilized outdated stationery bearing the old "Manufacture Royale" letterhead for making paper negatives, probably following Louis-Désiré Blanquart-Evrard's modifications to William Henry Fox Talbot's calotype process. Robert was soon experimenting freely with both wet and dry paper processes. He eventually became a recognized expert in all the period's methods, and from 1858 to 1872 he enjoyed a state appointment teaching photography to engineers at the École des ponts et chausées and the École du génie maritime.



Robert, Louis-Remy. Alfred Thompson Gobert.
The Metropolitan Museum of Art, Purchase, Joyce and Robert Menschel, Mrs. Harrison D. Horblit and Paul F. Walter Gifts, and Rogers Fund, 1991 (1991.1044) Image © The Metropolitan Museum of Art.

Raised in an environment filled with art and artists, Robert was already an accomplished portraitist who had exhibited pastels in the Salon (1848, 1849, 1850) when he took up the camera, and he may have initially approached photography with a view to creating *aides memoire*. By 1851 he was frequently posing his family members and colleagues at the Manufacture for portraits, many of which are remarkable for their animation and warmth, notwithstanding their lengthy exposures. A few images made of his colleagues in the laboratory are among photography's earliest images of workers in the workplace.

Robert's photographic activity increased steadily in the early 1850s. This was encouraged in part by the arrival in 1852 of the new factory director, Victor Regnault, who was an avid amateur photographer. Although the two men surely shared their interest, experience,

and expertise in calotypy, they practiced independently and cannot be called collaborators. Thus, while Robert and Regnault's relationship was never close—unlike Robert's friendship Count Olympe Aguado, with whom he made photographic outings—it did strengthen the place of photography at the manufacture. He may also have taught photography to others at the factory. Moreover, Robert's quasi professional photographic activities in the fifties leave no doubt that photography virtually became his second career. He was particularly active as a landscape and architectural photographer, beginning first by photographing in the nearby Parc de Saint-Cloud with his small portrait camera (approximately 27 × 22 cm), and later acquiring a larger camera (approximately 33 × 38 cm) for views. His invention of a negative holder that could be loaded with up to fifteen dry paper negatives allowed greater ease photographing in the field. In 1853 he published a portfolio of thirteen architectural views in Blanquart-Evrard's edition *Souvenirs de Versailles*, and his photographs of medieval architecture in Brittany were copied in lithography for publication in the first volume of *Anciens évêhés de Bretagne* (atlas and first volume, 1855). Traveling in Normandy in the early 1850s, he also made a series of large views on the grounds of the Chateau d'Eu. These muted pictures, which feature rustic, timbered sheds, barns, hay wagons, ancient, massive beech trees, and the architecture of the 18th-century glassworks on site, are indebted to the model of the Barbizon painters, who were in turn indebted to Robert's grandfather Demarne, who had been instrumental in introducing French painters to naturalistic Flemish landscape painting. Robert in fact maintained close friendships with two of the principal painters associated with Barbizon: Camille Corot, a family friend who lived adjacent to Sèvres, and Constant Troyon, an intimate friend since boyhood.

Robert's most well known photographic work, however, was in still life, and from the beginning of his photographic career he had envisioned using photography to document the extensive Sèvres output and historical collections. He photographed a few arrangements of ceramic vases, statuettes, glassware, and artist's props using paper negatives, but expanded and refined the project for the 1855 Exposition Universelle. The Manufacture de Sèvres was to be France's showcase institution for this international exhibition, and Robert thought to make photographic reproductions the factory's showpieces. Seeking a more subtly detailed image, he learned the albumen-on-glass process from Hippolyte Bayard, and produced a group of salted paper prints from glass negatives of Sèvres wares that was offered for sale at the exhibition. Robert won critical notice with these pictures in several photographic salons and exhibitions in the early 1850s and 1860s. In 1863, Robert proposed the funding of a photography studio at Sèvres for the purpose of cataloging the factory output, which was approved in 1865 after much ministerial resistance.

A member of the Société française de photographie from 1855 on, Robert was involved in the society's activities until the end of his life in 1882. His personal photographic production is estimated at some 600 paper negatives, but most of his later work on glass (outside of the factory catalog) has not survived.

LAURIE DAHLBERG

See also: Calotype and Talbotype; and Régnault, Henri-Victor.

Biography

Louis Robert was born on 3 October 1810, and was raised beyond the western edge of Paris in Sèvres, where his parents were employed by the Manufacture de porcelaine de Sèvres. Raised to take his place as a factory artist but trained also in chemistry, he directed the atelier of painting on glass from 1832 until 1847, when he was promoted to *chef de peinture*. He began working in paper negative photography around 1850 and turned the camera to portraiture, landscapes, architectural studies, and still life arrangements. His photographic activity at Sèvres was encouraged by factory director Victor Regnault, a fellow amateur photographer who assisted Robert in establishing a photography studio in the factory to record Sèvres' output and museum collection. Some of Robert's architectural work was published in the early 1850s, including thirteen views that comprised Blanquart-Evrard's 1853 edition, *Souvenirs de Versailles*. A technical expert in all the period's processes, he taught photography from 1858 to 1872 at the École des ponts et chausées and the École du génie maritime. He was active in the Société française de photographie from 1855 until his death in 1882.

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ROBERTSON, JAMES (c. 1813–1888)

James Robertson was trained in London under William Wyon, the Chief Engraver at the Royal Mint. In 1841,

Robertson, James. A Turkish Lady. From the "Hickes Album" 1855–1860.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

he himself accepted an appointment as Chief Engraver at the Imperial Mint in Constantinople (present-day Istanbul), and held that position for forty years, until his retirement on October 29th 1881. Within days he sailed with his family to Yokohama, to join his brother-in-law and business partner, Felice Beato. He died in Japan on April 18th 1888.

The move to Constantinople, which may have begun for Robertson as a young man's light-hearted adventure, proved to be a step which changed the course of his life. Highly respected for his work, a senior officer of the Mint, and honoured several times for exemplary service, he still found time to open another avenue of artistic achievement. At some stage in 1852, possibly inspired by the example of another expatriate, the French engineer Ernest de Caranza, he took up photography, and for the next fifteen years devoted considerable time and effort to mastering the new art, and establishing a new business.

Conditions conspired to favour his ambitions. Constantinople itself was a prize for any photographer, exotic, picturesque, still little known but much dreamed of by westerners as the epitome of oriental mystery and romance. The recent, ever-expanding network of regular rail and steamship services throughout Europe and the Mediterranean basin had also put within easy reach of the city regions held in special honour: Greece, the cradle of Western civilization, and also Egypt and the Holy Land, the settings for hallowed events in the Old Testament and the New. Besides these places of timeless significance, there was one other which achieved great topical importance for a short time. The Crimean Peninsula, site of the war fought between Russia and the Allied Forces of Britain, France and Turkey in 1854–1856, lay just one full day's voyage from Constantinople.

Each of these territories was tapped for treasure by Robertson during his photographic period. Permanent residency in Constantinople made it possible for him to record at leisure the city's splendid buildings and characteristic street life. Images from other places were gathered in short, concentrated camera forays. His first album of Constantinople views was published in London in December 1853; his first sample of Grecian antiquities followed in 1854. As a pioneer war reporter, Robertson paid several brief visits to the Crimea between June 1855 and late spring 1856. On his way from the Crimea to England that summer, he stopped for a while in Malta, to take and sell photographs there as well, before continuing on his journey. With his two Beato brothers-in-law he made an excursion to Egypt and the Holy Land in the spring of 1857, and re-visited Greece later that year. After this flurry of activity the pace slowed, but a number of albums filled with assorted views of Constantinople, Athens and Jerusalem were issued at intervals until the autumn of 1867, when the end of his photographic adventure was announced by the sale of his business premises and all their contents.

Robertson's career had developed along logical and harmonious lines. In his days he was not only an engraver by profession, but also an amateur enthusiast who made charming, lively watercolours and sketches of the daily life around him. For such a young man, with an artist's training and an artist's eye, who was also making a home for himself in a strange, exciting world, it was natural to pick up a new toy, the camera, and play with it. Very soon he realized that he was ideally placed to derive profit as well as pleasure from the hobby. He tried many ways to bring his pictures to the attention of the public, and his enterprise provides an insight into the workings of the early photographic market.

By the end of 1854 he had established a studio in Constantinople, from which he sold prints to Western residents of the city, and to travellers passing through. From 1856 he expanded his business by working for a few years with Felice Beato, a photographer who went on later to an adventurous career in the Far East.

Robertson's pictures could be bought in London and Paris, and viewed there in photographic exhibitions. They were to be found in ports of call, like Malta, on the Mediterranean route, or purchased at a military camp in the Crimea. Engravings based on his work appeared in

books and on the pages of the illustrated press. Professional organizations like the Architectural Photography Association marketed his images, and so did commercial ones like the steamship companies, which offered engraved versions of his photographs as souvenirs.

Robertson's eye was caught by buildings, monuments, structures, the play of light on carved and modelled surfaces. His photographs of Grecian antiquities and scriptural sites in the Holy Land presented objects which may not have been seen before by his viewers, but which were already steeped for them in a thousand associations. As far as possible he tried to isolate the venerated subject matter from the distractions of contemporary life, with just a few small human figures to give a sense of scale. Even before he set foot in Athens or Jerusalem, he knew well what his camera must do. Its task was not to startle or surprise but to pay homage.

In the Crimea, Robertson was constrained by no such expectations. One of the first war reporters, he had to establish tradition, not to follow it. The pictures for which he is famous are silent witnesses to the cost of conflict. No dead bodies are shown, but the devastation of military fortifications and civilian buildings tells its sobering story. In Constantinople also, Robertson was free to tell a new tale, not to illustrate an old one. The city was fascinating to Westerners but occupied no special place in the collective consciousness. His camera could show both the architectural marvels of the place and the mundane life swirling around them. His record of the city earned him the title by which he is best known, "Robertson of Constantinople."

Bridget A. Henisch
Heinz K. Henisch

Biography

James Robertson, born in 1813–1814, in Middlesex. was the son of Thomas James Robertson, and he was christened in the Church of England. In 1855 he married Matilda Beato, and they had three daughters. Trained in London as a coin engraver, he spent forty years in Constantinople at the Imperial Mint. On his retirement there in 1881, he and his family went to Japan, where he died in 1888. Active as a photographer from 1853 to 1867, he exhibited examples of his work in Britain throughout that period, at the Royal Society of Arts (1854), the Photographic Society of London (1855–1858), the Manchester Art Treasures Exhibition (1857), etc. His Crimean photographs were on display in London and some provincial cities from December 1855 to December 1856. His first published album of views appeared in 1853, his last in 1864. Engraved versions of his pictures were shown from 1853 onward in several illustrated journals, in Britain and continental Europe.

See also: Beato, Felice.

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ROBINSON, HENRY PEACH (1830–1901)
British photographer

Robinson was born in Ludlow, Shropshire, on 9 July 1830. He was the first child of John, a Master of the National School of the Church of England, and Eliza Robinson. Young Robinson had artistic ambitions, but as there was no formal art education available in Ludlow, he taught himself to draw and paint. Robinson's father, however, was unconvinced of his ability to make a living as an artist, so Robinson went to work for various printers and booksellers in Ludlow, London and Leamington for the years 1844–1856. Nevertheless, Robinson continued to draw and paint during these years, and he produced hundreds of watercolors, pen and ink drawings, and etchings. The acme of his artistic achievement came in 1852 when the Royal Academy accepted his painting *View of the Teme near Ludlow* for their annual exhibition.

In 1851 Robinson learned the daguerreotype process from a visiting photographer, and he experimented with photogenic drawings and calotypes, and then later with the collodion process. Dr Hugh Diamond visited Robinson in 1854 and enthusiastically encouraged Robinson's photography. Robinson continued to refine his photographic techniques, and in 1856 he decided to pursue commercial photography as a profession. With a loan of £100, Robinson opened a photography studio in Leamington on 12 January 1857.

Robinson is most well known for his attempt to create artistic compositions through photography. Basing his photographic art technique and compositional style upon principals of academic painting, Robinson produced large prints for the annual exhibitions of the Photographic Society. In 1858 Robinson exhibited *Fading Away*, which was controversial for two reasons: its subject matter and its compositional technique. Some critics felt that its subject, a young middle-class lady

dying of consumption, was too painful to depict with the realistic medium of photography. To compose the narrative image, Robinson used combination printing, a technique in which a photographer created a picture by printing parts of several negatives together. Robinson used this technique to make up for the technical shortcomings of the collodion process and because it allowed him to carefully compose an aesthetic picture. Whereas Robinson felt that photographers should be able to use any technique that furthered the aesthetic appearance of the image, Alfred H. Wall and other critics felt that combination printing was dishonest. Undeterred, Robinson continued to use combination printing for the remainder of his photographic career. In 1861 Robinson exhibited another controversial combination print of a young woman doomed to die—*The Lady of Shalott*. This photograph was based on the title character from Alfred, Lord Tennyson's allegory of artistic creation. In effect, Robinson's *Shalott* staked a claim that photography could illustrate and even interpret poetry, or in other words, it could depict the imaginary. Some critics had harsh opinions, saying that the subject went beyond the appropriate boundaries for photography.

After the two controversial subjects of *Fading Away* and the Pre-Raphaelite *Lady of Shalott*, Robinson vowed to stick to themes of "the life of our day," but he still wanted to create a type of photography that would be accepted as art. For the next fifty years, Robinson produced photographs that almost exclusively imitated British genre painting, depicting rustic maidens and old cottagers. This subject matter allowed him to explore the creative principles of photography while still permitting him to picture a conservative and familiar type of reality.

Robinson was an active member of the Photographic Society of London, to which he was elected in 1857. He was elected to the Society's Council in 1862, and he was elected Vice-President in 1870. In 1891, however, he withdrew from the Society after he was censured for allowing the late entry of George Davison's photographs into the annual exhibition. The following year he helped to form the Linked Ring, an association of photographers dedicated to developing their medium as an art.

Throughout his career, Robinson was a prolific writer, publishing nine books and over 150 articles in various photographic journals. His most popular book, *Pictorial Effect in Photography: Being Hints on Composition and Chiaroscuro for Photographers* (1869), went through four English and American editions and was also published in French and German. These books were mostly aimed at other commercial photographers, and Robinson encouraged these photographers to create pleasing images by following compositional and lighting principals of Fine Art.

Robinson operated commercial photography studios for the majority of his artistic career. His initial studio in Leamington fared well, and he offered portraits on paper, glass or ivory, plain or colored, as well as hand-colored art reproductions, landscapes, documentation of public buildings and residences, and printing of amateurs' negatives. Robinson suffered from ill-health, largely due to the hazards of photographic chemistry, and he halted commercial practice in late 1864. After more than three years of rest, Robinson opened up a commercial studio in 1868 with a partner, Nelson K. Cherrill, in Tunbridge Wells, Kent. Robinson and Cherrill collaborated on many artistic combination prints during their partnership, which lasted until 1875. Their lavish studio featured prominent displays of studio portraiture and also many examples of Robinson's artistic exhibition photographs. It also exhibited nearly fifty medals Robinson had won at various exhibitions throughout Europe and America. Robinson retired from commercial practice in 1888.

Although he had retired from commercial photography, Robinson was still very as an artist and writer. In 1889 began a brief, but very heated, public debate with the British photographer Peter Henry Emerson, who had implicitly criticized Robinson's oeuvre in his book *Naturalistic Photography for Students of the Art*. (Emerson disdained combination printing, for example, saying that it was "the art of the opera bouffe" and that Oscar Rejlander was the only artist he knew who had used it.) Robinson negatively reviewed Emerson's book, concluding that Emerson's theories were symptomatic of a recurrent "disease," for which Robinson's views were the "disinfectant." This prompted a heated and insulting reply from Emerson that concluded, "I have yet to learn that any one statement or photograph of Mr. H.P. Robinson's has ever had the slightest influence upon me, except as a warning what not to do." Their public debate effectively ended with Robinson's assessment of Emerson's retraction of his theories as "a petulant jeremiad."

Robinson died in 1901, survived by his wife, Selina, and their five children: Edith, Ralph Winwood, Maud, Ethel May, and Leonard Lionel.

DAVID COLEMAN

See also: Photographic Exchange Club and Photographic Society Club, London; and Wet Collodion Negative.

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ROBINSON, RALPH WINWOOD (1862–1942)
English photographer

Ralph Winwood Robinson, son of the eminent pictorialist Henry Peach Robinson (qv), took over the family portrait studio in Tunbridge Wells, Kent, in 1885 when his father's failing health forced his retirement. The business became known subsequently as H. P. Robinson & Son, and had a considerable reputation for child portraiture. He later took over the Rembrandt Studio in Redhill, and another in Croydon. He was a highly respected pictorialist in his own right, and his enthusiasm for exploring the unique aesthetics of the photograph led him to become a founder member of the Linked Ring Brotherhood in 1892.

Ralph W. Robinson also developed a ground-breaking approach to location portraiture, producing a highly acclaimed series published as Royal Academicians and Associates. These studies showed the artists at work in their studios, and sitters included Alfred Waterhouse, George Frederick Watts and others.

Like many professional photographers in the closing years of the 19th century, Robinson found his livelihood being eroded by offers of cheap portrait photography in return for coupons being offered by soap manufacturers and tobacco companies. As a direct result of this, Robinson and others banded together and established the Professional Photographers' Association in London in 1901.

JOHN HANNAVY

ROCHE, RICHARD (1831–1888)
Canadian photographer

Richard Roche was born on June 16, 1831 in England. He joined the Royal Navy in 1851, setting sail in October 1856 as a third lieutenant on HMS *Satellite* for British Columbia, which was reached via Cape Horn on June 7, 1857. He likely carried a camera with him, as a scrapbook at Yale University Library (call number WA MSS S-1817) contains photographs documenting portions of the vessel's voyage and the joint military occupation of San Juan Island in which Roche took part. Roche served on the ground as a member of the Northwest Boundary Commission in 1858 and 1859, who included among its members Royal Engineers trained as photographers, until he was recalled to assist in the joint occupation of San Juan Island by British and American troops. Early in 1860 just prior to the *Satellite*'s departure, he struck up a friendship with Francis George Claudet who lived aboard the vessel for a time. After Roche's retirement, he settled on the Isle of Wight where he died in 1888. Roche's name is commemorated by place names in BC and Washington. Less than three dozen prints identified or attributed as his work survive in Canadian and American public collections.

DAVID MATTISON

RODGER, THOMAS (1833–1883)
English photographer

As a 'boy assistant' in Dr. John Adamson's St. Andrews lecture room, Thomas Rodger could truly claim to have been in at the birth of photography in Scotland. He became interested in photography at an early age, being taught by Adamson and eventually assisting him.

Thomas Rodger was born in St Andrews. His father, also named Thomas, was a painter, but Thomas Jr. chose to study chemistry and later medicine rather than art. Nonetheless, by 1849, at the age of sixteen, he had opened a photographic studio in the city. He lived and worked at his studio, in St. Mary's Place, for his entire professional life.

Amongst his early calotype subjects—exhibited at the Aberdeen Mechanics Institute exhibition of 1853, were portraits of Dr. John Adamson himself, views of the ruins of St. Andrews Cathedral, and several of the city's colleges.

Rodger exhibited his pictures in London, Edinburgh and Glasgow over a period of several years, but all the images exhibited from 1854 were by the wet collodion process rather than the calotype.

Rodger's friendship with John Adamson endured for many years, and accounts of the 1857 Exhibition of the Photographic Society of Scotland report a series of posed studies of the game of golf—then enjoying a considerable resurgence of interest—credited jointly to the two men.

JOHN HANNAVY

RODRÍGUEZ, MELITÓN (1875–1942)
Colombian photogrpaher and studio owner

Melitón Rodríguez was born in Medellín, Colombia and worked at his craft between 1892 and c.1939. He may

have received some training from artist Francisco Cano but was primarily self-taught. He worked in partnership with his brother Horacio until 1897, after which he continued on his own. Although the Colombian coffee industry grew significantly during his lifetime and brought prosperity to the Medellín area, in general Rodríguez struggled to support his wife and nine children, three of whom later worked with him in the studio.

His images recorded a variety of subjects in both studio portraits of individuals and groups and in outside views. He photographed modern developments such as railroads, trolleys and automobiles; urban monuments, buildings and events; rural scenes, locations and people, and ethnographic "tipos." He is remembered for recording the opening of the Amaga Railroad line in 1914.

Rodríguez was passionate about his craft, painted his own backdrops and for several years kept a diary in which he recorded his attempts to develop his skills and abilities as a photographer. He received a number of local awards for his work and in 1895 received a silver medal at a New York show sponsored by the photography journal, *Light and Shadow*. The image was that of "Los Zapateros" ("The Cobblers"). His archive of over two hundred thousand negatives is considered the official record of the Province of Antioquia during the first half of the twentieth century. The archive is preserved in Medellín at the Biblioteca Pública Piloto.

Yolanda Retter Vargas

ROENTGEN, WILHELM (1845–1923)

Wilhelm Roentgen wrote or co-wrote fifty-eight scientific papers, but only the three he published on X-rays, which he discovered and named, are now well known. Among other subjects he investigated were the ratio of the specific heat of gases, the polarisation of light in gases, pyroelectricity and piezoelectricity, refractive indices of fluids, and the compression of liquids and solids. At the time of his discovery of X-rays in 1895, he was looking at electrical discharges through gases at low pressure.

Roentgen began studying cathode rays generated in a Crookes tube in the autumn of 1895. To detect them, he used paper coated with barium platinocyanide, which fluoresces when struck by cathode rays. On 8 November 1895 he noticed that one of the sheets, lying some distance away from the covered tube, was glowing. Photographic plates fogged in similar circumstances had been observed previously, but Roentgen was the first to investigate further. Since the range of cathode rays in air had been shown to be only a few centimetres, he deduced that the glow must be caused by some other form of ray. Placing his hand in the path of the rays caused the outline of his bones to appear on the coated paper.

X-rays are produced when cathode rays strike the wall of the tube and Roentgen experimented with a range of materials to determine their properties. He found that interposing materials varying in density affected the brightness of the rays by different amounts. A magnetic field did not deflect them as it did cathode rays but neither did they exhibit reflection, refraction or polarisation. It was because of these unusual characteristics that Roentgen characterised them as "X-rays," X standing for unknown as he could not determine their nature, although they were soon also known as Roentgen rays in his honour. The theory behind the phenomenon was unclear to him—he thought that they might be longitudinal vibrations in the ether. Later research showed that they were electromagnetic waves with a very short wavelength.

On 22 December 1895 he took the emblematic image of his wife's hand wearing a ring. He sent a paper entitled *On a New Kind of Ray* to the Würzburg Physical-Medical Society six days later and on New Year's Day 1896 sent copies, with samples of X-ray images, to a number of European colleagues. The story was published in Vienna on 5 January and was soon widely disseminated, bringing Roentgen instant fame. He followed his first paper with two more, in March 1896 and May 1897, which mapped the properties of the new ray.

The phenomenon was easily replicated, with unambiguous results; and unlike the increasingly abstruse details of laboratory science, the results were obvious to the layperson. Popular international interest too was immediate and paralleled scientific dissemination through the academic press. Awareness was stimulated by reproductions in illustrated magazines of X-ray images of a wide range of objects. They became the subject of an enormous quantity of commentaries as well as fiction, poetry and cartoons, though the satirical edge of many betrayed fears over loss of privacy and possible immorality.

The nature of X-rays raised the difficulty of fitting them into a conceptual framework, hence the alignment with photography which, despite the efforts of a number of early commentators to point out the obvious differences, glossed over the method by which each was achieved. As the images created by X-rays could be recorded on photographic plates, it was a natural assumption that they shared other characteristics. X-rays were seen as analogous to photography except that they captured information not visible to the naked eye.

Despite these differences the label "New Photography" caught on quickly, and had a certain validity. Photography had already extended the capabilities of perception, with its ability to freeze motion, take images of stars invisible to the naked eye and record microscopic organisms. At the same time Roentgen was announcing his discovery, moving images, which could reproduce motion, were being projected for the

first time, though at first X-rays received by far the greater coverage. X-rays appeared to be another method by which reality could be analysed with a permanent image as the result. The association was reinforced as photographers, realising the commercial possibilities, took up X-ray portraits as a side line. It was not long, however, before the negative side effects of uncontrolled use were appreciated.

Wild claims were made initially, for example one in March 1896 that X-rays were being used to transmit anatomical diagrams directly into the brains of medical students. Two months later a young farmer was reported to have used X-rays as an updated Philosopher's Stone to transmute cheap metal into gold. More reasonably, they were touted as an alternative to vivisection, their non-invasive character contrasting positively with the scalpel. The temperance movement too felt that they would have an educative effect by demonstrating the deleterious physiological effects of alcohol and tobacco.

X-rays also slotted into the discourse around spirit photography, with their shared emphasis on photographing the invisible, phenomena that could not be seen with the naked eye. The early terminology used to describe X-rays (notably ether and vibrations) was similar to that used by spiritualists, and the figure of Sir William Crookes, both inventor of the 'Crookes tube' that was an essential component in producing X-rays, and a figure strongly associated with Spiritualism, reinforced the link. Darget and Baraduc's thoughtographic experiments were conducted using a device called a 'radiographer,' showing a clear debt to Roentgen. The ability to see what was otherwise hidden was used to legitimate the claims of clairvoyants, who maintained that they did the same.

The medical and metallurgical applications of X-rays were quickly appreciated, assisted by Roentgen's refusal to patent the discovery so that humanity would benefit from it. Familiarity with the new technology, and appreciation of its limitations, soon caused a loss of interest among the general public. There was also an increased appreciation of the differences with photography during the second half of the decade, and "New Photography" faded away.

TOM RUFFLES

Biography

Wilhelm Conrad Roentgen was born 27 March 1845 in Lennep, Rhine Province but grew up in the Netherlands. He obtained his PhD on the properties of gases from the University of Zurich in 1869. In 1870 he moved to the University of Würzburg, the first of a number of academic posts in the next decade. After spells at Strasbourg, Württemberg and back at Strasbourg, he took the Chair of physics at Giessen University in 1879. Würzburg offered him the Directorship of its Physical Institute in 1888 and he became its rector in 1894. After a demonstration of X-rays to the Kaiser he was awarded the Prussian Order of the Crown, Second Class, and was made an honorary citizen of Lennep. He was appointed professor of physics at Munich in 1900 and accepted the first Nobel Prize for physics in 1901. He died of cancer on 10 February 1923 and was buried with his wife Anna at Giessen.

See also: Spirit Photography; and Crookes, Sir William.

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ROLL FILM

From the early 1850s, experimenters had been looking for an alternative to glass as a support for light-sensitive emulsions. The weight and bulk of glass plates added greatly to the photographer's burden, added to which, of course, was the constant danger of breakages. Talbot's caloytpe process had shown that paper could be used satisfactorily as a negative support. Paper could be used either in sheet form or as a long band. The first practical proposal to use a band, rather than a sheet, of sensitised paper came in a British patent of 1854 by Joseph Blakey

Spencer and Athur James Melhuish. They described a camera attachment called a roller slide or rollholder containing a band made by gumming together sheets of sensitized paper. The paper was attached at each end to a pair of rollers and could be wound from one roller to another in order to take several exposures in succession. Several similar devices were patented during the 1850s and 1860s, including one designed by the famous portrait photographer Camille Silvy, in 1867. None of these early devices, however, were widely used. The first rollholder to enjoy a modest degree of commercial success was designed in 1875 by Leon Warneke, a Russian living in England. Warneke's rollholder contained a one hundred exposure roll of tissue coated with a film of gelatine or dry collodion emulsion that could be stripped from the paper for processing. Warneke's design was the inspiration for the first commercially successful rollholder, designed by George Eastman and William H Walker in 1884. The Eastman-Walker rollholder used strips of sensitised paper or stripping film, sold under the name "Eastman's American Film." Such was Eastman's faith in the future of film photography that he changed the name of his company from The Eastman Dry Plate Company to The Eastman Dry Plate *and Film* Company. At this time, 'film' effectively meant "paper," used either as a negative material in its own right or as a support from which a negative-bearing emulsion layer could be stripped during processing. Eastman was not alone in realising the disadvantages associated with paper and the need to develop an alternative support for film photography. However, any substitute would have to fulfil a number of criteria—it would have to be light, tough, flexible and transparent. Many flexible film supports were tried in the 1880s, including the idea of using several layers of collodion emulsion, but the answer was eventually found in one of the most important synthetic materials developed during the nineteenth century—celluloid.

Celluloid has its origins in the work of an Englishman, Alexander Parkes. In 1855, Parkes was granted a patent for a substance which he called *Parkesine* produced using a mixture of oils and gums as a solvent for nitrocellulose. In America, brothers John and Isiah Hyatt discovered that camphor under heat and pressure acts as a nitrocellulose solvent. They called their new material *celluloid* and in 1872 they founded the Celluloid Manufacturing Company which made a range of products from celluloid, such as dominoes and billiard balls. As celluloid became better known, its qualities recognised and its use as a substitute for other materials widened, photographic experimenters became increasingly interested in its possibilities. A number of people attempted, unsuccessfully, to promote the use of sheets of celluloid as a substitute for glass plates, including David and Fortier in France and Waterhouse in England. The breakthrough came in 1888 when John Carbutt, an Englishman born in Sheffield who had emigrated to America as a young man, put on the market the very first commercially produced gelatin emulsion-coated celluloid sheet film. Although marketed as "flexible negative film," Carbutt's celluloid sheets were, in fact, relatively stiff and unsuitable for production in long strips for use in rollholders.

In 1887 Hannibal Goodwin, a relatively unknown clergyman and amateur photographer in Newark, New Jersey, filed an application in the U.S. Patent Office for a 'transparent sensitive pellicle better adapted for photographic purposes, especially in connection with roller-cameras.' Goodwin was a self-taught chemist and his patent application was broad and somewhat ambiguous in its wording. For two years, the application remained unissued, undergoing several amendments, but by this time other inventors, most notably George Eastman and his chemist Henry Reichenbach had entered the field. In 1888, the year that he introduced the Kodak camera, George Eastman began to seriously explore the possibility of manufacturing flexible rolls of sensitised celluloid. He set his young research chemist, Henry Reichenbach on the task and the following year both Eastman and Reichenbach filed patent applications for flexible celluloid film. These interfered with Goodwin's application, filed two years earlier, setting in motion a legal battle that would drag on for over twenty years. Eastman's celluloid film went on sale in the autumn of 1889 and was available in a range of sizes to fit the various rollholders and the growing range of Kodak cameras (four different models by this time). The commercial potential for rollfilm was enormous, as Eastman quickly realised. In March 1889 he had written to his business partner William Walker: "The field for it is immense… If we can fully control it, I would not trade it for the telephone."

Eastman did not enjoy a monopoly of film manufacture but his company did come to dominate the market. Throughout the 1890s, boosted by the rapid growth of amateur photography and its use in cinematography, transparent celluloid rollfilm was produced in ever increasing quantities. All this time, Goodwin's patent application remained under consideration. It was not until 1898, eleven years after his original application had been filed, that Goodwin was finally granted a patent. After his death in 1900, Goodwin's patent was sold to the American firm of Anthony and Scovill, who took out a suit against Kodak for patent infringement in 1902. The case dragged on for over ten years and, finally, in August 1913 it was ruled that Goodwin's patent had indeed been infringed, "not on the ground that Eastman had copied the process, but that Eastman's process, though an improvement, came within the Goodwin patent claims." The following year, Eastman paid

his competitor five million dollars as compensation. A huge amount, but tiny when compared to the profits that Eastman had earned from sales of celluloid film in the intervening years.

COLIN HARDING

See also: Camera Design: 5 Portable Hand Cameras (1880–1900); Camera Design: 6 Kodak (1888–1900); Carbutt, John; Eastman, George; Kodak; Melhuish, A J; and Parkes, Alexander.

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ROOT, MARCUS AURELIUS (1808–1888)

American photographer

At the height of his career in the 1850s, Marcus Aurelius Root was one of America's preeminent daguerreotypists, renowned for the elegance of his portraits, the eminence of many of his sitters, the flawless finish of his plates, and the size and opulence of his studios. Root was also one of the most prolific and influential writers on photography of his era, contributing numerous articles on both the art and profession of photography to the journals of the period. He supposedly coined the term "ambrotype." Root's book, *The Camera and the Pencil or The Heliographic Art* (1864), remains a major source on the theory and practice of photography in America in the 19th century. Finally, Root was a pioneering photographic historian and collector: *The Camera and the Pencil* includes the first the history of American photography ever written, and Root assembled a collection photographic original works spanning 1839–1876 for display in the Philadelphia Photographic Society's pavilion at the 1876 Centennial Exposition in Philadelphia, which resents the first exhibition surveying the history of photography. (This collection remained largely intact and forms the core of the collection of early Philadelphia photography held by the Library of Congress.)

Marcus Aurelius Root was born and grew up in Ohio, where he took art lessons and worked briefly as a portrait artist while studying penmanship (ornamental copperplate writing). Root moved to Philadelphia in 1832 to study portrait painting with Thomas Sully, but finding he lacked talent as a painter, began teaching penmanship, then a very lucrative profession. He opened a writing academy in Philadelphia in 1835, and devoted most of the next decade to running his school, teaching penmanship, and authoring manuals on its philosophy and practice.

In 1839 and into the early 1840s, Philadelphia—then the home of American science—was the major center of daguerreian activity and experimentation in the United States. Root naturally became interested in the process and by 1843 had learned it. His teacher was Robert Cornelius, one the first Americans truly to master the daguerreotype. (Cornelius, who introduced using bromine to increase the sensitivity of daguerreotype plates in 1839, opened the first portrait studio in Philadelphia 1840. He also invented the superior plate polishing compound used by many of the top American daguerreotype studios, including South and Hawes—and Marcus Root.) Deciding to practice daguerreotypy professionally, Root learned the business by becoming a partner in galleries in Mobile, Alabama, New Orleans, Louisiana, and St. Louis, Missouri, 1844–1845. In 1846, he returned to Philadelphia, bought out John Jabez Edwin Mayall, whose studio at 120 Chestnut Street was one of the city's leading daguerreian establishments, and within a short time had established a reputation for the superior artistic and technical quality of his portraits. In 1849, Root opened a studio in New York in partnership with his brother Samuel, but sold his share to his bother in 1851. In the meantime, Root consolidated his reputation by exhibiting his work at the annual fairs sponsored by Franklin Institute in Philadelphia (1844, 1846–1849), the American Institute in New York (1846–51), and at the international expositions at Crystal Palace in London (1851) and the Crystal Palace in New York (1853), where he won a bronze medal. In 1851, when the first American professional photographic journals were founded, Root became a frequent contributor, and by the time a serious injury suffered in a railroad accident caused his premature retirement from gallery work in 1856, he was recognized as one of the major figures in the profession in the United States.

Marcus Root wrote the *Camera and the Pencil* during his recovery. Conceived as a comprehensive two-volume theoretical and practical manual for practitioners, Root's magnum opus promotes photography as a legitimate aesthetic medium and as a significant form of American cultural expression. The first volume (1864), is one the major documents of 19th century photographic literature: it includes the first history of photography, chapters on aesthetics and art appreciation, and offers an extended discourse promoting the high standards of artistic and technical proficiency in the practice of the photographic profession of which Root was an ardent advocate. When the second volume, a handbook of processes and practical photographic technique, was destroyed in the presses when the printers burned to the ground, Root retired from the field.

Root's final contribution was the exhibition surveying the history of photography, 1839–1876, which he

organized for the Philadelphia Centennial Exposition in 1876. Granted only a small panel at the end of a dividing panel instead of the 12-foot wall he requested, Root was able to display only a fraction of the collection of original early material he had assembled, much of it obtained directly from Philadelphia's pioneer daguerrians. This collection—which included some of the earliest and most important examples of American daguerreotypes—remained largely intact after the Centennial and afterwards, and was eventually acquired by the Library of Congress, where it represents one of the great treasures in the Library's collection of photography.

When Marcus Root died in 1888 as a consequence of injuries received in a streetcar accident three years earlier, he was remembered as "one of the first daguerreotypists in America"—meaning one of the best and most successful. Indeed, portrait plates by Marcus Root typify and epitomize American studio daguerreotypy at its best, and good examples of his work are prized by collectors. In the end, however, Root's real importance lies not in his art, but in his writing and in his prescient understanding of the importance of preserving the story and the artifacts of photography's history.

WILL STAPP

See also: Cornelius, Robert; and Mayall, John Jabez Edwin.

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ROSLING, ALFRED (1802–1882)

English

Alfred Rosling was a London timber merchant from a Quaker family who, as early as 1846, made large-scale stereo still-life calotype studies for use in a Wheatstone viewer. He was a founder member of The Photographic Society, becoming its treasurer in 1859, and The Photographic Exchange Club. He exhibited 20 landscapes from paper negatives plus four microphotographs from collodion negatives, in the first photographic exhibition, at the Society of Arts in 1852. Like George Shadbolt, who was also a timber merchant, Rosling was an early experimenter with microscopic photography.

He used calotype, waxed-paper ,as well as collodion negatives, favoring the French chemist Dr .J.M. Taupenot's dry collodion process.

In 1859 Rosling and his family moved to Reigate where they became neighbors of the famous photographer Francis Frith and in 1860 Rosling's 22 year-old daughter, Mary Ann, married fellow Quaker Frith, 38, who had recently returned from his travels to the Middle East. Rosling's landscape and tree studies were later published by Frith and many of his views taken throughout Britain were used in early photographically illustrated books.

Rosling's work, which is mainly known through his Exchange Club studies, as well as the views published in the 1860's by Frith, is always technically accomplished and carefully composed.

IAN SUMNER

ROSS, ANDREW & THOMAS (1798–1859)

Of all the British photographic lens manufacturers the firm of Ross was the most significant and long-lasting with an involvement in photography's British origins, innovations in optical design throughout the nineteenth and twentieth centuries and a history which only ended in the third-quarter of the twentieth century.

Andrew Ross was apprenticed to John Corless an optician and instrument maker in 1813, and worked with the optician Gilbert until 1829. By 1830 he had established his own business as an optician, mathematical and philosophical instrument maker and by 1839 was trading under the name of Andrew Ross & Co. Ross remained involved in the business until his death in 1859 training his son, Thomas (1818–1870), who was to succeed to the business and John Henry Dallmeyer (1830–1885). Dallmeyer married Andrew Ross's second daughter Hannah, and was left one-third of Ross's fortune of over £20,000.

Thomas Ross and Dallmeyer separated and Dallmeyer established his own optical business in 1860. The

Ross business became Thomas Ross & Co, then from 1871 Ross & Co and finally from 1898 Ross Ltd. During the second half of the twentieth century the firm became associated with the Houghton-Butcher photographic business. It was last recorded as a manufacturer c. 1970 making binoculars before it was dissolved in c. 1975.

From 1830 Andrew Ross quickly established a high reputation for his microscopes and he was responsible for a number of significant improvements in microscopy design some in conjunction with Joseph Jackson Lister (1786–1869). Both were founder members of the Microscopical Society of London. Ross was a supplier of lenses and optical apparatus to William Henry Fox Talbot from at least 1838 and Talbot also visited his Regent Street shop. During one such visit on 30 March 1839 it is likely that Ross mentioned the work of the Reverend J. B. Reade and his use of gallic acid when preparing sensitized paper. Reade had previously spoken to Ross about this, a fact which emerged in the 1854 *Talbot v Laroche* lawsuit.

Ross acted as an intermediary between Talbot and the Parisian optician of Alphonse Giroux, the maker of Daguerre's camera, ordering two daguerreotype cameras with lenses for 320 francs on 7 October 1839 following two months of experimenting with the daguerreotype and communication on the matter with Talbot. Talbot was later to recommend Ross's services in securing such apparatus to Walter Trevelyan in 1842.

The Petzval lens was one of the first lenses designed specifically for photography being announced in 1841. The lens worked at f/6 and Ross was immediately able to improve it to work at f/4. Ross's son, Thomas, working in his father's factory made a novel lens for Henry Collen on 2 June 1841 being a double made of two cemented achromatic lenses. It was not a commercial success being unable to compete with the superior definition of the Petzval. Ross made other lenses for Talbot.

Henry Collen, a professional calotypist in London, ordered a camera from Ross but by March 1842 was complaining to Talbot that Ross had not delivered it and probably never would as he was having difficulties with the curved paper holder made to correct the focus of the lens. In August Collen was complaining to Talbot that Ross had not delivered a large lens of wide aperture he had ordered. This was never made. In 1848 Talbot was recommending Ross's enlarging camera to Thomas Malone, another professional photographer.

This involvement with the British early photographers gave way to more commercial activities including in c1860 a mammoth lens with a focal length of 6 feet (*sic*) producing an image of 44 × 30 inches for John Kibble of Glasgow. The camera to which it was attached was mounted on wheels and drawn by a horse.

Aside from optics the firm also sold and made a range of cameras and photographic equipment. An extant catalogue from 1855 records Ross's success at the 1851 Exhibition for lenses and 'the best camera in the Exhibition' and it details a range of portrait and landscape lenses, cameras, stands and accessories, together with chemicals and equipment required to operate the Calotype, Daguerreotype and collodion processes. From 1861, Ross was also responsible for making Thomas Sutton's camera for panoramic photography and continued making it's distinctive water-filled lens. Ross's Universal Binocular camera of 1862 was a particular success.

From 1864 Thomas Ross developed a range of lenses called Doublets and based on his father's Collen lens. After Ross's death in 1870 the firm brought in a series of managers and lens designers including some from Germany who continued to produce new photographic lenses alongside the firms other optical products. In 1874 the firm brought out their portable and rapid symmetrical lens calculated by F. H. Wenham. Ross was the first firm to employ a scientist as a lens mathematician and Wenham was with the company from 1870 until 1888. He was followed by Hugo Schroeder.

Ross was awarded various medals and diplomas for their optics and claimed a list of the leading photographers of the period as users of the their lenses including: Henry Barraud, Francis Bedford, Henry Dixon & Son, Elliott & Fry, Thomas Fall, Robert Faulkner, Francis Frith, Frank Good, Hills and Saunders, Payne Jennings, Lock and Whitfield, J. E. Mayall, George Washington Wilson and Frederick York.

In 1890 the firm became Zeiss's London agents and made many Zeiss lenses, including the Protar (from 1 April 1892), the Planar, Unar and the Rudolph-designed Tessar, all under licence. Ross also made a version of a Meyer lens under it's own name as the Homocentric from 1902 which was a popular and long-lived design.

When Schroeder left Ross he was succeeded by J. W. Hasselkus whose first lens design was issued in 1898. The firm established a large factory at Clapham Common in 1899.

During the last years of the nineteenth century Ross issued several new designs of camera to supplement their traditional wooden field and studio cameras. The first of their twin lens reflex cameras the Portable (Divided) camera was launched in 1890 and a single lens reflex camera launched in 1905 which was made by Kershaw of Leeds. Other photographic optical equipment such as optical lanterns was also sold.

Throughout the nineteenth century photographic optics was just one part of the Ross company's wider optical manufacturing activities. While its involvement in photographic optics was maintained well in to the twentieth century cameras and associated photographic equipment was increasingly being bought in from other manufacturers and sold under the Ross name. Unlike

Dallmeyer which did develop some truly original lens designs the Ross company after Andrew Ross's death relied more on refining optical designs from Germany and selling its own version as well as manufacturing well-known German designs under licence. It introduced few original optical designs of it's own.

MICHAEL PRITCHARD

See also: Dallmeyer, John Henry & Thomas Ross; Talbot, William Henry Fox; Giroux, André; Daguerre, Louis-Jacques-Mandé; Petzval, Josef Maximilian; Henry Collen, Henry; Exhibition of the Works of Industry of All Nations, 1851: Reports by the Juries; and Calotype and Talbotype.

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ROSS, HORATIO (1801–1886)

A talented marksman and athlete, Horatio Ross was also an important figure in the history of early photography in Scotland. He was born at Rossie Castle, Forfarshire Scotland on 5 September, 1801, the son of Hercules and Henrietta (Parish) Ross. He joined the 14th light dragoons in 1819 and retired as a Captain in 1826. Ross then embarked on a political career as a member of parliament for the Aberdeen and Montrose boroughs but did not seek re-election after 1834. An avid hunter, Ross wrote the introduction to a book titled *Deer Stalking and Forests*, in 1880. He lived at his family home, Rossie Castle until 1853, when he purchased the estate of Netherley in Kincardineshire. In 1834 he married Justine Henriette Macrae. Their marriage lasted over fifty years and produced five sons, Horatio, Edward, Hercules, Colin and Robert.

One of Ross's earliest photographs is thought to be a quarter plate daguerreotype, made in 1847, that depicts his eldest son and a friend, fishing. Although it is unusual for a amateur photographer to tackle the complexities of the daguerreotype process, eight plates at the Victoria and Albert Museum attest to Ross's perseverance and skill with this technique. Two years later, in 1849, Ross learned the rudiments of the paper negative process from a professional photographer from Edinburgh, James Ross (no relation). Several of his albumen prints (often measuring 11 × 14 inches) were made from waxed paper negatives but even by about 1856 Ross was also using the wet-plate collodion process. A photograph from about 1858, made by his wife Justine, shows him preparing a plate in his home studio.

Ross's primary subjects were his family and other deer stalking enthusiasts. He also made "trophy" photographs the spoils of his activities as a deer-stalker as we can seen in photographs such as *Stag in Cart*, c. 1858 (Gilman Paper Company Collection). Set against the rugged landscape of the Scottish Highlands, the fallen stags are often arranged in a manner meant to produce the best pictorial effect. The branch-like antlers of the deer are silhouetted against a blank sky or massive boulder in order to highlight their spiky form. He worked within the English Picturesque tradition, photographing views of shepherds' huts, winding streams, waterfalls and rocky outcrops. Some writers have even suggested that the frequent use of a screen of trees or rocky crevices is the result of Ross's expertise as a consummate hunter. He is also known for his views of Edinburgh and various estates (and private hospitals) from around the Scottish countryside.

One of the founders of the Photographic Society of Scotland in 1856, Ross was the vice-president at the time of the society's first exhibition and held that position until 1863. Ross was a forceful advocate for the place of the amateur photographer within the society. He even went as far as delineating which fields of photography were suited to amateurs and which should be left to the professionals in a paper he read to the February 10th 1857 meeting of the PSS, where he argued that the "proper field for the Amateur's labor is in the open air. Portraiture he should leave in the hands of the professional gentlemen." He later defended the position of the amateurs at a special meeting of the society in 1858, when the professional members sought to establish a greater presence on the on the hanging committee. His motion to reject a proposal that would limit the number of amateurs in the society was supported by the majority of members.

Although Ross's work was exhibited frequently during his lifetime it is not as well known today. There are several known albums of his work and his picturesque views are often compared to the work of his contemporaries Roger Fenton and Benjamin Brecknell Turner. As a gentleman-amateur photographer Ross was typical of many of photography's early inventors and experimenters. While his hunting scenes can be seen as the product of the particular class and generation, they, along with his landscapes and architectural views, and portraits of friends and family, form a unique picture of life in Scotland in the mid-19th century.

Horatio Ross died at Rossie Lodge, Invernesshire, on the 6th of December, 1886. The *Dictionary of National*

Ross, Horatio. Tree. *The Metropolitan Museum of Art, Gilman Collection, Purchase, Harriette and Noel Levine Gift, 2005 (2005.100.17) Image © The Metropolitan Museum of Art.*

Biography emphasizes Ross's accomplishments as a politician, athlete and marksman. His versatility with various photographic processes and his enthusiasm for recording the life and landscape the surrounded him, have also left an indelible mark on the early history of photography in Britain.

LORI PAULI

List of Exhibitions

1856 Edinburgh, Photographic Society of Scotland.
1857 (September) Birmingham, *First Annual Exhibition of Photographs, Stereoscopes, Apparatus and Etc*. Birmingham Photographic Society.
1858 (February 18) London, *Supplemental Exhibit, 5th Year, Exhibition of Photographs and Daguerreotypes at the South Kensington Museum*, Photographic Society of Great Britain.
1858 Edinburgh, *Photographic Society of Scotland.*
1859 Aberdeen, British Association Meeting in Aberdeen, 1859 Exhibition of Photographs, Hen and Chicken Hotel.
1859 (April) Glasgow, *Glasgow Exhibition of Photographic Works*, Glasgow Photographic Society.
1859 (December 1858) Edinburgh, *Scottish Exhibition of the Photographic Society of Scotland*, Photographic Society of Scotland Exhibition Rooms, 90 George Street.
1860 (December 1859) Edinburgh, *Scottish Exhibition of the Photographic Society of Scotland*, Photographic Society of Scotland Exhibition Rooms, 90 George Street.
1861 (January) Edinburgh, *Fifth Scottish Exhibition of the Photographic Society of Scotland*, Photographic Society of Scotland Exhibition Rooms, Mr. Hay's Rooms.
1867 (January) Paris, *Exposition Universalle*, Palace of the Champ des Mars.
1874 (October–5 November) London, *19th Annual Exhibition of the Photographic Society of Great Britain,* Suffolk Street Gallery, Pall Mall.

Collections

J. Paul Getty Museum, Los Angeles, California, United States.
Detroit Institute of Arts, Detroit, Michigan, United States.
Metropolitan Museum of Art, New York, New York, United States.
Harry Ransom Humanities Research Center, University of Texas, Austin Texas, United States The Science Museum, London.

See also: Wet Collodion Positive Processes.

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ROSSE, LADY (1813–1885)

English photographer

Lady Rosse was born Mary Field in Yorkshire in 1813 to Anne Field and John Wilmer, a wealthy landowner. Her mother died shortly after her birth and she was raised by a governess. In 1836, she married William Parsons, Lord Oxmantown, and they took up residence at his family's seat at Birr Castle in Ireland. He became the 3rd Earl of Rosse after the death of his father in 1841. Lady Rosse took up photography in 1854 following the lead of her husband, who began experimenting with the daguerreotype process in 1842. Among her photographs that survive are group portraits, single portraits and landscapes, as well as many pictures of telescopes built by her husband. Lady Rosse was closely involved in the Earl's construction projects, and some of her first photographs portray his telescopes. The Photographic Society of Ireland awarded Lady Rosse their first Silver Medal in 1859. She was an elected member of the Dublin Photographic Society and the Amateur Photographic Association. Lady Rosse moved to London in 1870 following the death of her husband in 1867. She died in London in 1885 and was buried in the family vault at Birr Castle in Ireland.

Andrea Korda

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ROSSETTI, DANTE GABRIEL (1828–1882)

English painter and photographer

Pre-Raphaelite painter and poet Dante Gabriel Rossetti was born in 1828 in London. Son of an Italian intellectual, Rossetti was the second of four children, including the art critic William Michael Rossetti (1829–1919) and poet Christina Rossetti (1830–94). Rossetti briefly trained as a painter at the Royal Academy schools and with Ford Madox Brown. He formed the Pre-Raphaelite Brotherhood in 1848 with other key members John Everett Millais and William Holman Hunt. Rossetti's relationship to photography was limited. He loosely used a group of photographs as the basis for many of his later portraits and studies of Jane Morris, the wife of designer, poet, and socialist William Morris. These albumen prints were taken in 1865 in the garden of Rossetti's home in Chelsea, London, by the photographer John Robert Parsons, but it is assumed that Rossetti posed Jane Morris himself. In the series of portraits, Jane Morris is posed against a cloth tent or a fabric-covered, patterned screen, wearing the loose-fitting clothes she adopted. She appears in several of the languid and flowing poses that Rossetti would make characteristic of her in his paintings. These photographs are housed in an album now in the collection of the Victoria & Albert Museum. Rossetti also posed with his siblings for a notable group of photographs taken in 1863 by Charles Lutwidge Dodgson (Lewis Carroll). Rossetti died in 1882 in Birchington-on-Sea after several years of illness.

Diane Waggoner

ROSSIER, PIERRE (1829–c. 1898)

Swiss photographer

Pierre Joseph Rossier was born on July 16, 1829, into a farming family in Grandsivaz, Switzerland. A passport issued to Rossier in October, 1855 listed his profession as photographer and indicated that he was to travel to France and England in order to practice his trade. Sometime between 1855 and 1858, Rossier was hired by the London photographic firm Negretti and Zambra. They sent him to Asia from 1859 to 1861, where he was among some of the first to produce commercial photographs (primarily stereographic views) of Japan and China. While in Japan, he trained Ueno Hikoma and other first-generation Japanese photographs in the collodion wet-plate procedure. His employment with Negretti and Zambra seems to have ended sometime in 1861. Rossier then traveled to Thailand, where he assisted the French zoologist Firmin Bocourt by taking ethnographic portraits of local people. He returned to Switzerland in 1864, operating a photography studio in Freiburg until at least 1876 that produced stereograph and cartes-de-visite views of local scenes as well as portraits. Captions on the mounts indicate that Rossier also had a studio in the Swiss city of Einsiedeln, although no dates of operation are known. He died in Paris sometime before 1898.

Karen Fraser

ROUCH, WILLIAM WHITE (1833–1871)

The business of William White Rouch & Co began in 1854 as a partnership trading under the name of Burfield & Rouch as operative chemists, philosophical and photographic instrument makers, at 180 Strand, London. By 1864 it was trading as W. W. Rouch & Co under which name it remained until it ceased actively trading in photographic equipment around 1914.

William White Rouch was a chemist and appears to have been the driving force behind the business. The firm was the wholesale agent for T. Frederick Hardwich's negative and positive collodion from the late 1850s and commenced dry plate manufacture from an early date. It was also active in the manufacture of photographic equipment advertising various forms of camera for amateur and professional photographers. Rouch also manufactured lenses and was an agent for the principal British and European lens makers and it offered a range of accessories for photography, chemicals and prepared collodions and papers. W. W. Rouch registered a design of portable camera with separate processing chamber in 1858 and the following year registered a portable dark tent which was still being advertised in the 1880s. An improved dark tent design was registered in 1861 and a photographic shutter in 1862. W. W. Rouch died at Mentone on 18 February 1871 aged 39.

A relation, Samuel White Rouch (died 1898) continued with the business. The Patent Portable camera of 1878 was based on S. W. Rouch's patent and proved very popular. It was improved in 1885 and in 1891 and the firm announced that it was being widely used by travellers and explorers including Henry Morton Stanley.

Rouch also introduced a hand camera to meet the demand for smaller, more portable cameras. The Eureka was one of the most popular magazine plate cameras of the later nineteenth century. It was based on Rouch's patents of 1887 and 1888 and the model was sold until at least 1910. The rear section of the camera held a number of plates (one model also made this interchangeable) allowing multiple exposures to be made before reloading.

Hand cameras aside, Rouch continued to offer older designs of cameras and photographic equipment and, increasingly, cameras from other makers. Its importance consequently decreased and the firm traded mainly as a retailer. After Samuel's death in 1898 his son William Albert Rouch continued to manage the business but his interests lay more as a photographer and he built up a successful career as a horse photographer illustrating several books during the 1930s.

By 1914 the manufacturing and retailing business had largely ceased and after the first world war the W W Rouch name continued as W. A. Rouch's photographic studio and remained in existence until at least the mid-1980s.

MICHAEL PRITCHARD

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ROUSSEAU, LOUIS (1811–1874)

French photographer

Born on February 23rd, 1811 in Paris (France), Louis Pierre Rousseau pursued a lifetime career in the Museum of Natural History, mainly as assistant naturalist in the department of Malacology. He also took part in three scientific journeys.

His talent for preparing and drawing specimens contributed in the development of his interest in the publication of scientific illustrations. After the project of publishing a large number of engravings failed, he eventually turned to photography in 1853.

With Achille Devéria, assistant curator in the French national library, he undertook the publication by installments of *Photographie zoologique*, sixty photographs showing rare specimens from the Museum collections (salted paper prints- negatives by Louis-Auguste and Auguste-Rosalie Bisson and prints by Lemercier, and later plates made by the photomechanical process of Niépce de Saint-Victor). Despite constant praise for its accuracy and beauty the project was never completed. In 1854, Louis Rousseau took a series of portraits and photographs of skulls for the anthropological gallery.

A founding member of the *Société française de photographie* (November 15th, 1854), he received its instructions for his journey to the North Seas in 1856, where he made portraits of Inuit and Icelanders (collodion). He is not known to have taken photographs thereafter.

He died of an illness caught during one of his journeys on October 14th, 1874 in Paris, after a long career as a naturalist and a brief one as a photographer.

CAROLINE FIESCHI

ROYAL COLLECTION, WINDSOR

Members of the British Royal Family have collected photographs since the 1840s. By 2005 these amounted to hundreds of thousands of images, but it had not been until the late 1960s that certain of them were classed as a photograph collection, which was subsequently kept in the Round Tower at Windsor Castle in England. By 2005 it numbered at least 350,000 images, of which about a tenth had been acquired in the nineteenth century.

The first members of the Royal Family known to have been aware of photography were Queen Victoria, and more particularly her husband, Prince Albert, who took a keen interest in the new medium. Both had artistic skills and tastes, and were intrigued by new inventions. In March 1842, while the Court was at Brighton, the Prince had himself photographed by William Constable. The Queen and the Prince soon recognised photography's potential uses, whether for recording people and places,

for instruction and inventory purposes, or as an art form in its own right.

By the early 1850s, the Royal couple had commissioned photographers such as William Kilburn and Brunell to take pictures of their family. These were at first intended solely for private use, but within a few years the Queen and her husband had begun to realise how photography could be used to make the Royal Family better known to the public; this was to lead to the expansion of Royal photographic portraiture throughout the nineteenth century and beyond. By 1900, such images were as much an appanage of Royalty as painted State portraits had ever been.

In 1853 Queen Victoria and Prince Albert became patrons of the Photographic Society (later the Royal Photographic Society). When they visited its first exhibition in January 1854, the Honorary Secretary, Roger Fenton, showed them the latest developments in the art through his own work and that of other photographers. As a result he was given the first of his royal commissions, which included photographing the Royal children taking part in a series of tableaux to celebrate their parents' fourteenth wedding anniversary in February 1854.

Work by other photographers, including William Lake Price, Alfred Rosling, and Oscar Rejlander was also purchased by the Queen and the Prince. George Washington Wilson, Adolfe Disderi, and J.J,E. Mayall were commissioned for specific purposes: Mayall's *Royal Album*, produced in 1860, made photographs of the Royal Family available to the general public for the first time.

By the time of the Prince Consort's death in December 1861, he and the Queen had collected several thousand images. These included British and foreign Royalty, Royal Household officials and staff, friends, acquaintances, politicians, actors, artists and musicians and the armed forces. In addition there were views of Royal residences, scenes at Coburg and Gotha (made in 1857 and 1858 by Francis Bedford as birthday presents from the Queen to her husband); military, topographical, art and genre photographs, and reproductions of works of art.

Queen Victoria continued to collect photographs in memory of the interest which she and her husband had shared, but her preference was less for art and genre photography and more for portraiture; one series of 44 albums, *Portraits of Royal Children*, showed her descendants from 1848–1899. Many photographers, including Dr. Ernst Becker (Prince Albert's German librarian), T.R. Williams, William Bambridge, Leonida Caldesi, Camille Silvy, Hughes & Mullins, Hills & Saunders, Mendelssohn, Alexander Bassano, Charles Bergamasco, George Piner Cartland, Professor E. Uhlenhuth, Backofen, W. & D. Downey and others were employed to produce this record. Many were granted the Royal Warrant.

The Queen also collected photographs of her relatives, staff, and people she had met, or was unable to meet except through the medium of photography. Among the portrait photographers whose work she purchased was Julia Margaret Cameron. Other material showed military campaigns, ceremonial occasions, such as the Queen's Jubilees in 1887 and 1897, or historic buildings, such as J. Benjamin Stone's photographs of the Tower of London in 1898. Views taken in Europe, Australia, India, the Andaman Islands, Africa and elsewhere enabled the Queen to see foreign countries and parts of the British Empire which she herself was never able to visit.

Queen Victoria and Prince Albert had encouraged their children's interest in photography and several of them, including the Prince of Wales (later King Edward VII) and Prince Alfred (later Duke of Edinburgh and of Saxe-Coburg-Gotha) learnt how to use a camera in their youth. During the nineteenth century all nine Royal children, by this time adults with their own families, collected photographs and many of these, formerly kept in their separate residences, had by the late twentieth century become part of the Royal Photograph Collection. They included property belonging to Prince Alfred, Princess Helena (Princess Christian of Schleswig-Holstein) and Prince Arthur (Duke of Connaught) and his wife, as well as Queen Victoria's grandchildren, such as the future King George V and Queen Mary.

The most significant collection belonged to Albert Edward, Prince of Wales, who by the time of his marriage in 1863 had assembled at least 1,000 images, mostly documentary or topographical, such as Roger Fenton's Crimean War series, or the views taken by Francis Bedford during the Prince's Tour of the Near East in 1862. From an early age the Prince also collected photographs of works of art. During the1860s he assembled a number of volumes of views of foreign cities, important buildings and other material which interested him, including some genre photographs by R.P. Napper. The Prince and his wife, (later Queen Alexandra), kept photographs of themselves, their family and their residences, and by the 1880s had lent their support to a new development. Simplified cameras, for amateurs, were newly available, and George Eastman presented one to the Prince and Princess in 1885. Within a few years the Princess had become a skilled and enthusiastic practitioner.

The last decade of the nineteenth century saw the various collections expanding as the Princess of Wales, her daughter, Princess Victoria, the Duchess of York, the Duchess of Connaught and others began compiling albums which contained not only work by professional photographers but also their own snapshots. When members of the Royal Family openly supported photography by exhibiting some of their own work at

a Kodak exhibition in 1897, they gave considerable encouragement to the general public to take up the medium as a popular hobby.

FRANCES DIMOND

See also: Victoria, Queen and Albert, Prince Consort; Royal Photographic Society; Fenton, Roger; Rejlander, Oscar Gustav; Price, William Lake; Rosling, Alfred; and Mayall, John Jabez Edwin.

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ROYAL ENGINEERS

The British Army's Corps of Royal Engineers was probably the first military unit to receive formal instruction in photography. Between 1854 and 1855 a small number of Sappers were trained on an ad hoc basis by civilian photographers in order to capture scenes of the Crimean War and to reduce maps and plans for the Ordinance Survey. In 1856 the War Department appointed Charles Thurston Thompson (1816–1868), Superintendent of Photography at the South Kensington (later Victoria and Albert) Museum, to train the Corp's non-commissioned officers in the wet-plate process. On receiving their certificate of competency, they were despatched to companies stationed overseas, from Greece to India and China, to document work in progress and make topographical and ethnographical pictures. Often working under inhospitable conditions they produced the earliest significant bodies of photographs of many little known places and cultures. They painstakingly recorded from the crest of the Rocky Mountains westwards along the 49th Parallel to the Pacific coast for the US/Canada Border Survey from 1858–62, and the 400 mile journey inland from Zula, Eritrea to Magdala during the Abyssinian expedition of 1868. By the1860s photography was offered as an optional course at the School of Telegraphy at the Royal Engineers Establishment at Chatham. Captain (later Sir) William de Wiveleslie Abney (1843–1920) established a separate Chemical and Photographic School there in 1874 which was absorbed into the Survey School in 1904.

ANNE-MARIE EZE

ROYAL GEOGRAPHICAL SOCIETY

The world through a lens

> No expedition … can be considered complete without photography to place on record the geographical and ethnological features of the Journey.
>
> John Thomson RGS Official Instructor in Photography 1885.

Photographs of Exploration

Today the Royal Geographical Society is today home to a remarkable collection of over 500,000 19th and early 20th century photographs. This collection was built up through the donation of photographs taken by many travellers, geographers and explorers. In addition, the growing importance the Society attached to photography during the Victorian period is in part due to John Thomson who in 1886 became the RGS's Instructor of Photography. He has recently undertaken photographic travels in China and Cambodia (alongside his celebrated collaboration with the journalist Adolphe Smith Street life in London 1878) and it was under his instruction that many RGS Fellows set of to photograph the furthest reaches of the known world.

Such work helped to underpin the use of the camera—alongside the sextant, compass and sketchpad—as an essential part of any explorer's equipment. While the aesthetic nature of photography was ever present there was burgeoning interest in its application for the scientific documentation and recording of the world. As Thompson noted *"the faithfulness of such pictures affords the nearest approach that can be made towards placing the reader actually before the scene which is represented."*

Photography's New Place in Exploration

Throughout the Victorian period expeditions continued to be documented both through existing forms—such as the sketch pad and oil paints—alongside the recent introduction of the camera. The tensions between these two forms can in part be seen in David Livingstone's Zambezi expedition 1858–64.

Livingstone was accompanied by his brother Charles—who was the expedition's photographer—

R. Allen & Sons. A group consisting of T. S. and Miss Livingstone, James Chumah and Susi and the compiler of MSS discussing the journals, maps and plans of the late Dr. Livingstone.
R. Allen & Sons (Nottingham) 1874. Royal Geographical Society.

alongside Thomas Baines an accomplished artist. Bain's and Charles Livingstone soon argued, and following a contrived story of the theft of a bag of sugar Baines was expelled from the expedition.

The animosity between these two visual professional is reflected in Baines's painting of the rapids on the Zambezi River in 1859. Baines is pictured centrally, striding purposefully across the scene sketch book in hand. However, the expedition's photographer is depicted as a diminuative, shrouded figure isolated and seemingly of little consequence.

Records of Hidden Histories

The photographic archive of exploration also reveals the hidden histories of individuals whose lives may have so easily been lost to history. For example, many may be familiar with the story of how after Livingstone's death the African members of his expedition carried his body, alongside his equipment and papers, back to the coast for where it was returned to England, However, what do we know of these Africa individuals?

Much is revealed in the following photograph showing James Chuma and Abdullah Susi (centre left and right) both members of Livingstone's expedition. As Dr Caroline Bressey notes, in a rereading of this image, it illustrates an uncommon scene of a white Victorian man—Rev Horace Waller (the editor of Livingstone's papers) looking up at two Black African individuals who are centre stage in the scene's composition. It was Waller who, when the RGS presented Chuma and Susi with medals recognising their contribution said; *"These faithful companions of Livingstone were able to give an intelligible account of every river and mountain and village in the regions they had passed through; and such aid as they could give was of the first importance to Mr. Livingstone in preparing the work on which he was engaged."*

It was only with some trepidation that the Society embraced the new technologies of lenses, blackout tents, chemicals and glass plates. For example, Hugh Mill wrote, in commenting of the use of images projected by lantern slides in the 1880's, that *"the proposal to illustrate papers read at the evening meetings by lantern slides was scoffed at by some who said it would lower the Society's discussion to the level of a Sunday School treat with a magic lantern."* However, the Society's growing enthusiasm for this new technology resulted in its purchase—albeit under the guise of how the images enhanced the 'scientific' value of lectures—of its own lantern in 1890.

In addition, a chapter on photography appeared in the second edition of the Society's *Hints to Travellers* (1865)—alongside sections on 'Outfits for an Explorer,' and 'Latitude and Longitude.' Professor Pole the author wrote that, "*any traveller or tourist, gentleman or lady may, by about a quarter of an hour's learning, and with the amount of apparatus that would go into the gentleman's pocket or lady's reticule, put him or herself into the position (to take a picture).*"

148/9 "the Society by degree added instruction in photography, geology, natural history and other subjects so that the traveller who took the whole course and

profited by it could start on his exploration with a full scientific equipment"

Conclusion

Today we may marvel at the lengths to which our Victorian ancestors toiled to gather photographs of their world. The Royal Geographical Society was central to the promotion, use and collection of photographs that recorded the global reach of Victorian Britain. Indeed, it was the Society's central concern—that of geography—than underpinned how it promoted photography. As James Ryan has argued, *"much Victorian colonial photograph, from travel and topography to natural history, was broadly about geography."*

Time may not have diminished the beauty of these photographs and we can continue to revel in their aesthetic qualities. However, perhaps of greater importance is that in their glass plates and sepia tones these 19th century photographs have captured an irreplaceable record of the world' people, places and environments.

STEVE BRACE

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ROYAL PHOTOGRAPHIC SOCIETY

The world's oldest national photographic society, the Royal Photographic Society of Great Britain, formed in 1853 as *The Photographic Society*, was not the world's first photographic organisation. That distinction goes to *The Edinburgh Calotype Club* established by a group of amateurs in 1841. Like the *Société héliographique française* founded in France ten years later, the Edinburgh club was a relatively informal grouping, and survived until 1856 and the formal establishment of the Photographic Society of Scotland. The *Société héliographique française* was disbanded in 1854, its place taken by the more formal structure of the *Société française de photographie* which still exists today.

The genesis of the *Photographic Society* can safely be traced back to the discussions in 1851–52 which prefaced the organisation of the world's first exclusively photographic exhibition at the Society of Arts in London in December of that year. By that time, surprisingly in advance of London, a photographic society had already been established in Leeds, and friendships developed through the informal *Calotype Club* in London in the 1840s had also surely underlined the value of such groupings.

The pivotal moment in the organisation of photography in 1852 brought together the leading amateurs and professionals of the day, under the leadership of Roger Fenton, to organise and mount a huge international showcase for the new medium. Seven hundred and eighty four exhibits from seventy-six named photographers and several more un-named were displayed at the Society of Arts from December 22nd 1852 until the end of January 1853. Significantly that event brought together most of those who would figure centrally in the first meetings of the new photographic society.

One figure surprisingly missing from the list of 1852 exhibitors was Antoine Claudet, a key figure in the establishment of the Photographic Society of London. Despite the widespread published attribution of the idea of forming a photographic society in London to Fenton, researches have significantly raised the importance of Claudet's input into the project.

An undated document exists in the National Museum of Photography, Film & Television, Bradford, England, titled *Photographic Society* which can tentatively be dated to some time in 1851. Recent researches (Kamlish 2002) strongly suggest that this document—which significantly predates Fenton's involvement with the idea—was written by Claudet.

The document opened

> It is proposed to establish, in London, a Photographic Society on the same principles as the Heliographic Society which has just been formed in Paris by a number of Gentlemen.
>
> The Object of this society is the advancement of the Science of Photography, and the diffusion of all the improvements made in the different countries where the art is practiced with some success.
>
> Every particular branch of science has in London a centre of action, a place of meeting where its followers can be brought in contact one with another, where they may be helped in their private research by the research of others where they can learn new discoveries as soon as they are published. It is time after ten years of unconnected and separate labours that Photography should take a rank among the most important Sciences. It is time to erect its temple.

Kamlish argues that Claudet's motivation was not entirely altruistic, that he had recently acquired premises at 107 Regent Street which were too large for his immediate needs, and that the establishment of such a centre for the promotion of photography would be an appropriate and profitable use for that space.

For whatever reason, Claudet's proposal remained unpublished, and probably circulated only to a very few people. Thus, no action was taken for at least a year. Claudet's right to be recognised the originator of the idea seems well made. Certainly, in Fenton's obituary (*Photographic Journal,* Sept 15 1869, 126) he, Fenton,

is recognised only as "one of the early promoters of the Photographic Society."

Fenton's enthusiasm for such an organisation was fuelled after he had become directly involved with members of the *Société héliographique française* during a visit to Paris in late autumn 1851—meeting with Gustave le Gray and others—and had been impressed both by the society itself, and its pioneering publication *la Lumière.* He published an account of his visit in *The Chemist*, February, 1852, making a particular point of praising the vision of the French in establishing their society—and using the readership of the journal as a conduit for promoting the idea more widely in Britain. In the following issue, March 1852, he published his "Proposal for the formation of a Photographical Society."

Kamlish postulates that Claudet—who had by 1852 become a near neighbour of Fenton's with a home in Gloucester Road—may have passed his proposals to Fenton in the hope that Fenton would be better able to promote them. That would be at odds with the relative photographic status of the two men at that time—Fenton a newcomer to the medium, and Claudet already recognised as one of the major players with ten years experience, a thriving London business, several important published papers on the science of photography, and a number of patents to his name. In any event, in his address to the inaugural meeting of the society in spring 1853, he reflected on the original ideas which had been mooted "in the winter of 1851–52."

Whatever the circumstances, Fenton's published proposal was pivotal, and was doubtless translated into a practical proposition during the preparations for the Society of Arts exhibition. In it he set out many of the tenets that drove the society for the following century and a half—many of them also contained within the Claudet document of a year earlier. Only a few of his proposals proved short-lived.

> As the object proposed is not only to form a pleasant and convenient photographic club, but a society that shall be as advantageous for the art as is the Geographical Society to the advancement of knowledge in its department, it follows necessarily that it shall include amongst its members men of all ranks of life; that while men of eminence, from their fortune, social position, or scientific reputation, will be welcomed, no photographer of respectability in his particular sphere of life will be rejected.
>
> The society, then, will consist of those eminent in the study of natural philosophy, of opticians, chemists, artists, and practical photographers, professional and amateur. It will admit both town and country members.
>
> Despite that proviso, and although the name adopted was *The Photographic Society*, it was often referred to as *The Photographic Society of London* reflecting the predominantly metropolitan make-up of its founding membership.
>
> Like Claudet, Fenton believed the society should have 'appropriate premises fitted with laboratory, glass operating room, and salon in which to hold its meetings. It would be some considerable time before that was achieved, the ordinary meetings throughout the early years being held at The Society of Arts.

Again, like Claudet, Fenton also proposed the regular publication of the society's proceedings, and the establishment of a library, but while Claudet proposed the establishment of a Permanent Collection and a Museum of Photography, Fenton's paper proposed an annual album of members' work. Despite annual albums being produced in the early years, it was Claudet's idea for a permanent collection which endured and which grew into the huge world-class RPS Collection which is now housed in Bradford at the National Museum of Photography Film & Television.

At about the time the proposal appeared in *The Chemist* in March 1852, Fenton and others met and formed a Provisional Committee to drive the idea of a society forward. They met frequently throughout the spring and autumn, and in an unusual choice of words, these meetings were reported as being held "with a view of organising a Society of those to whom such a *re-union* would be acceptable." Fenton became honorary secretary of the provisional committee, and his role was pivotal in spreading news of the new initiative as widely as possible. Throughout that period he was also actively involved in the proposed exhibition at the Society of Arts, the two parallel engagements giving him regular access to like thinkers.

The provisional committee, which had met regularly at the offices of the *Art Union* journal in the spring, suspended its activities in the summer, as one of the stumbling blocks in the formation of the society, which they had to consider and deal with, was the existence of William Henry Fox Talbot's calotype patent—the restrictions it placed on the development of photography was seen as incompatible with an independent photographic society. After representations by Sir Charles Eastlake and Lord Rosse, Talbot's agreement was reached to relax the patent, at least for amateur users, and progress towards the establishment of the society was restarted with a further series of meetings in autumn 1852.

The Inaugural Meeting of the new Society was held on January 20th 1853 at the Society of Arts—a few days before the exhibition closed—with Sir Charles Eastlake in the Chair, who opened his address by confirming that the chairmanship had initially been offered to Talbot, but that the inventor had declined.

The inaugural Council of the new society included, amongst others, such luminaries as Charles Wheatstone, Sir William Newton, Hugh Welch Diamond, Fenton as Secretary, Peter le Neve Foster, Peter Fry, Robert Hunt, John Dillwyn Llewelyn (whose name was recorded

as 'Lewellyn'), the Count de Montizon, Hugh Owen, Alfred Rosling, Charles Vignoles, several of whom had also exhibited at the Society of Arts at the end of the previous year. In his eloquent introduction to the catalogue for that exhibition, Fenton had written that the society "will be the reservoir to which will flow, and from which will be beneficially distributed, all the springs of knowledge at present wasting unproductively."

The first issue of the *Journal of the Photographic Society* was published on March 1st 1853, and with only minor interruptions, has been published ever since. Despite having a membership a little shy of four hundred by the mid 1850s, the popularity of the journal amongst the entire photographic community meant that it was producing four thousand copies per issue. Its founding premise—that it would serve as a conduit for an interchange of ideas and successes amongst photographers in all countries—has held good ever since.

The topics covered in early editions of the journal ranged from transcripts of lectures given at meetings, and in-depth discussions on the chemical composition of sensitising and developing baths, to the rolling controversy over whether photography was an art of a science. Reprints of articles published in *la Lumière* were also included, as were reports on the proceedings of regional photographic societies, and transcripts of key lectures given in Liverpool, Manchester and Edinburgh. A thriving letters column soon became a mainstay of the publication, allowing both town and country members to share their experiences, their difficulties, and their discoveries.

Within six months of the formation of the society, Queen Victoria and Price Albert had agreed to become patrons, initiating a Royal association with the society which has endured to this day and which, in 1894, culminated in the change of name to the *Royal Photographic Society of Great Britain.* It was Prince Albert who, unwittingly, resurrected Claudet's idea of a permanent collection of members' works in 1854, but several years passed before the idea was acted upon. In the meantime, infrequent albums of members' work were produced and circulated by groups within the society, operating under the names of *The Photographic Club*, and *The Photographic Exchange Club*.

One of the initiatives contained within both Claudet's and Fenton's proposals was the mounting of an annual exhibition, and the first such display opened at the Society of British Artists, on London's Suffolk Street, with an evening soirée on 3rd January 1854. The Annual Exhibition remains a focal point of the Society's year today. In those Victorian exhibitions, the majority of the works were for sale, the society augmenting its funds by taking a 10% commission off the sale price.

By the end of the first year, with professional photographers assuming a greater influence over the proceedings of the society, the first Annual General Meeting in February 1854 voted, by show of hands, to exclude all professional photographers and photographic dealers from sitting on Council of holding office within the society. Fenton, at the end of his first year as secretary of the society he had helped form, informed the meeting that were this to be implemented, he would feel obliged to resign—he was at the beginning of his own eminent career as a professional photographer. After further discussion, the meeting was persuaded of the folly of such a move, and the vote reversed. The Photographic Society was not unique in having to learn to live with the uneasy marriage of amateurs and professionals.

But it was the presence and the influence of the scientists and the professionals who drove much of the important early work undertaken by the society's various ad hoc committees.

Most significant amongst those committees was what became known as the 'Fading Committee' chaired by Fenton in 1855, and set up to investigate the apparent impermanence of both salted prints and albumen prints. Under the chemical direction of T. F. Hardwich, the committee came up with sound recommendations for the avoidance of the problem—specifically using fresh hypo, and gold toning. Hardwich had correctly identified that sulphur compounds in the prints, caused by over-used fixer were a primary cause of the problem—eliminated by using fresh fixer—and that sulphur in the atmosphere exacerbated fading, a factor reduced by toning with gold chloride.

Other committees played important roles in the further understanding of the chemistry of the collodion process, and very significantly, in moving towards the establishment of realistic copyright protection for photographs and photographers.

These scientific and legal engagements did much to raise the public profile of the society, but beneath the surface, the ongoing debate about the status of photography within the worlds of art and science continued. The uneasy marriage of photographic artist and photographic scientists continued throughout the society's first forty years until, in 1892, the Vice President Henry Peach Robinson, frustrated by what he saw as a lack of recognition of the art of photography, led a breakaway group to leave the society and establish what became known as the Brotherhood of the Linked Ring. Their manifesto stated that the breakaway group had been established "as a means of bringing together those who are interested in the development of the highest form of Art of which Photography is capable," and was a direct response to their belief that the society's direction was biased against them. The recently elected President, Sir William de Wiveleslie Abney was one of the leading (and most opinionated and widely published) photographic scientists of his day, with a declared lack of interest in

the creative side of photography. He remained President until 1894, was re-elected again in 1896, and again in 1903, serving until 1905.

The society, in its first half-century had been led by a succession of eminent scientists, and clearly the photographic artists felt they were not receiving equal recognition, and that the society's leadership showed little sympathy towards their aspirations. Sir Charles Eastlake had been succeeded in 1855 by Sir Jonathan Frederick Pollock MP, barrister and mathematician, who held the presidency until 1869. He was immediately followed by James Glaisher, one of the society's founder members, who remained in office until 1892. Then came Abney, and all three had emphasised in their various presidential addresses that they saw the advancement of photographic science as being a far more important pursuit than the development of the art. Indeed, going back to Claudet's original proposal, he suggested only that the society's primary object should be "the advancement of the Science of Photography." It was Fenton who first broadened the brief and Sir Charles Eastlake whose introductory address first embraced the value of photography "both to Science and to Art."

In the 20th century, the recognition of disparate groups within the society, each focused on a specific aspect of photographic art or science, defused such potential minefields and ensured that the broad diversity of photography proposed by Fenton almost a century earlier were equally and individually represented.

Over the first seventy years, the society's collection of photography developed in an unstructured manner, dependent upon gifts from members rather than a focused gathering together of a representative cross section of the images produced. Thus, when John (J) Dudley Johnston decided to focus on the society's history in his Presidential Address in 1923, he found few examples of past members' work with which to illustrate his lecture. Roberts (2001) notes that he was able to find only about one hundred images in the attic of the society's house, many of the early works having either been damaged or, simply, lost. It is thanks to Johnston's zeal—as Honorary Curator from 1927 until 1955—that the society developed its unique collection, retrospectively acquiring prime examples of 19th century work as well as gathering the best contemporary work available. Roberts notes that over 70% of the work in the collection was produced by members of the society.

It was, therefore, towards the middle of the twentieth century before Antoine Claudet's 1851 suggestion—that the society should gather "specimens of the art contributed by members or procured from different countries"—became a valuable reality.

JOHN HANNAVY

See also: Bridges, George Wilson; Claudet, Antoine-François-Jean; Fenton, Roger; Talbot, William Henry Fox; Wheatstone, Charles; Diamond, Hugh Welch; Foster; Fry, Peter Wickens; Hunt, Robert; Llewelyn, John Dillwyn; Montizon, Count de; Owen, Hugh; Rosling; Vignoles, Charles Black; Robinson, Henry Peach; and Brotherhood of the Linked Ring.

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ROYAL SOCIETY, LONDON

The Royal Society of London for Improving Natural Knowledge was founded in 1660 and established by Royal Charter in 1662. It is the world's oldest scientific society in continuous existence and today acts as the UK's national science academy. It is an organisation of Fellows, currently numbering around 1300 of the world's leading scientists.

The Society and its Fellows had a longstanding interest in the component parts of what in the 19th century became photography: light, optics and chemistry. Early opportunities to develop photographic technique occurred on the fringes of the Society: for example, in solar printing experiments by Thomas Wedgwood and Humphry Davy (a future Royal Society President). J.N. Niepce approached the Society, apparently with the intention of submitting a paper on his work, but did not do so. These episodes in photographic pre-history led to no practical Royal Society involvement in scientific research on the subject.

However, from 1833, the problem of recording an image from life by camera was being considered in a serious if intermittent way by William Henry Fox Talbot FRS (1800–1877). Talbot had already written on mathematical and optical subject, thus earning election to the Royal Society's Fellowship in 1831. He had early contact with intellectually sympathetic Fellows such as John Herschel and David Brewster and the former would provide crucial support following the first announcement of Talbot's research interests in his paper 'Some account of the art of photogenic drawing' which was read to the Society on 31 January 1839.

Remarkably, Talbot's paper was not published in full in the Royal Society's *Philosophical Transactions*, but was abstracted. However, it, and news of L.J.M.

Daguerre's work in France generated a wave of interest in photographic science, particularly on the part of Sir John Herschel FRS, who had followed newspapers and other printed accounts of the new inventions. Herschel quickly provided his own important contributions to both Talbot and the wider world, most importantly on the use of sodium thiosulphate as a fixing agent. His photochemical experiments were published by the Royal Society in three major papers as were basic coinages such as 'photography,' 'positive' and 'negative.' These terms were in circulation amongst the Fellowship well before their first appearance in print. Herschel himself developed several novel photographic processes which were communicated to the Royal Society, notably the chrysotype and cyanotype and remained for some time an unofficial consultant and prime mover on matter concerning photography.

As knowledge of the new images gained currency among Britain's scientists, other important photographic researches were relayed to the Society, often encouraged or mediated by Herschel. Thus, Robert Hunt FRS (1807–1887) published not only in the *Philosophical Transactions*, but also produced the first important popular digest on photographic technique. Joseph Bancroft Reade FRS (1801–1870), meanwhile, investigated and to an extent repeated his peers' work on the usefulness of gallic acid in developing latent images, reporting on his work to the Society. In addition to improving elements of processing, Fellows also looked almost immediately for applications of the photograph to scientific work. As early as 1839, the use of sensitized paper as a recording medium for barometric and meteorological instrument observations was being discussed by the circle of Robert Were Fox FRS (1789–1877).

It was not just the scientific elite who were caught up in the excitement of photography. The formal development of photographic science was accompanied by popular interest, the general currency of which owed much to the personal networks of the Society's Fellows. Thus, for example, the first serially-published photographic book (and one with serious natural history intent) was Anna Atkins' *British algae*. Atkins (1799–1871) adopted Herschel's blueprinting technique for the purpose; her father was John George Children (1777–1852) a Fellow of the Royal Society and chairman of the 1839 meeting of the Society at which W H F Talbot had described his process for the first time.

That Royal Society's scientists themselves played a role in popular photography is evidenced by the work of Sir Charles Wheatstone FRS (1802–1875) and Sir David Brewster FRS (1781–1868) on stereoscopic photography, a popular offshoot of a development which had serious scientific merit. In the aftermath of the Great Neapolitan Earthquake of 1857, for example the Society (via Robert Mallet FRS) financed the gathering of damage evidence and earth movement using, in part, stereo photographs and these were also used for astronomical purposes. However the greatest single contribution of the Society and its Fellows in this respect was in the relaxing of Fox Talbot's calotype patents. Many of the Society's principally-concerned Fellows provided evidence on the merits of the patents and on the history of Talbot's researches, while the Society's then-President, William Parsons 3rd Earl of Rosse (1800–1867) cowrote a crucial letter to Talbot in 1852 which had significant impact on his relenting in aspects of his claims.

The Society continued to be interested in scientific applications of photography in the 1850s and 1860s. Many of these are very well-known. Warren de la Rue FRS (1815–1889) took important steps in astronomical photography. His initial work on the moon was privately conducted, inspired by daguerreotypes he had seen at the Great Exhibition of 1851 and such images proved more useful than the human eye in resolving lunar features. His solar work, particularly the cost of producing regular photo-heliograph images at Kew, was underwritten by the Royal Society and results were the subject of a Royal Society Bakerian Lecture by de la Rue in 1862. At the opposite scale, the Society provided research support to the physician Richard Leach Maddox (1816–1902), then producing photo-micrographs as illustrative material for paper submissions to the Society. Maddox would later perfect lightweight gelatine plates for photographic use.

An under-researched aspect of the Royal Society's role in promoting photography lies in the organisation's regular use of images at its annual exhibitions of science. In the 19th century these were known as soirees or conversaziones. At these events the latest developments in scientific research were (and still are) presented to invited audiences and in their earliest incarnations, photographs were themselves the subject of display. One famous later Victorian participant was the photographer Eadweard James Muybridge (1830–1903) who in 1889 presented his instantaneous photographs of animal motion. The event concealed an episode that reflected very badly on the Society. Muybridge had submitted a paper on 'Animal locomotion' for publication by the Society in 1883 but its author was quite unfairly suspected of plagiarism and it remained unpublished, thereby temporarily damaging Muybridge's reputation as the originator of motion photography.

As the 19th century drew to a close, the use of standard photographic methods in support of scientific work and publication became a matter of routine and the Society's immediate involvement in photography waned in favour of more specialist organisations. To put this into perspective, photography was a relative novelty in scientific travels of the 1850s, such as Mallet's work in Naples and that by Charles Piazzi-Smyth FRS

(1819–1900) in Teneriffe in 1856. But even by the time of the pioneering oceanographic expedition undertaken by HMS *Challenger* in the years 1872–1876, initially championed by the Royal Society and led by its Fellows William Benjamin Carpenter FRS (1813–1885) and Charles Wyville Thomson FRS (1830–1882), things were changing. The expedition had its share of 'firsts' (including images of iceberg) but more important were the large numbers of photographs taken as an integral part of the expedition scientific record, in the same manner as note-taking, specimen collection and instrument readings.

KEITH MOORE

See also: Wedgwood, Thomas; Davy, Sir Humphry; Niépce de Saint-Victor, Claude Félix Abel; Talbot, William Henry Fox; Cameron, Henry Herschel Hay; Brewster, Henry Craigie; Daguerre, Louis-Jacques-Mandé; Hunt, Robert; Maddox, Richard Leach; and Muybridge, Eadweard James.

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RUDGE, JOHN ARTHUR ROEBUCK (1837–1903)

English photographer

Born in Bath, England, 26 July 1837. His father Henry Rudge, a wood carver, and his mother Christiana, were middle-class reformers. By 1861 Rudge was lecturing on electricity, experimenting with an electric model train and an electric boat, and in 1863 was listed as a "philosophical instrument maker." In the 1860s or 70s he projected simple silhouette moving images with a "Wheel of Life" lantern slide. In 1875 Rudge created the Biophantic Lantern. A carousel with seven slides moved intermittently around the lamphouse. Rudge became associated with portrait photographer William Friese-Greene, and probably initiated Friese-Greene's interest in motion photography. They produced various motion effects with glass slide sequences.

Rudge's "Jumbo Funniosities" (c.1882), projected on a more developed machine, featured sequentially posed photographs of a toy elephant; a precursor of stop-motion motion picture animation. Another device featured four converging lenses to project a static slide bearing four portrait photographs. A rotating shutter directed the light to each one in turn, creating a limited movement effect. About 1887 he screened with his last machine, the Biphantascope, a motion series of 12 photographs of 'A Boy in an Eton Collar.' A lifelong bachelor, Rudge died in Bath on 3 January 1903.

STEPHEN HERBERT

RUSKIN, JOHN (1819–1900)

Art critic and social commentator who took a keen interest in photography

John Ruskin was, and still remains, best known for his art criticism and social commentary. His many artistic pursuits including drawing and watercolour painting, designs of various kinds, poetry and other literary works, have been assimilated into a cannon that reveals the breadth and depth of Ruskin's originality. His first four major publications, volumes one and two of *Modern Painters* (1843 and 1846), *The Seven Lamps of Architecture* (1848) and *The Stones of Venice* (1852), established his reputation as a writer of powerful intellect and rare ability to convey both the experience and the significance of the act of seeing. These publications also demonstrated Ruskin's commitment to the social responsibility of art. Ruskin was a prolific writer as the 39 volumes of his 'Works' testify but he was also an eloquent public speaker who lectured on a dazzling array of subjects, both before and after he became the first Slade Professor of Fine Art at Oxford in 1869. Writing almost a century later in 1964, Kenneth Clark pronounced that merely to read Ruskin was accepted proof of possession of a soul and, from the numerous editions of his publications, he was read extensively. His legacy extends to such different individuals as Oscar Wilde, Alfred Milner, Arnold Tonybee, Cecil Rhodes and the numerous realist landscape artists of the second half of the nineteenth century. Ruskin's importance to the history of photography is that he made many references to it during a period of over sixty years, he employed it intermittently in his publications and lectures, he recommended it as a drawing aid, he purchased photographs and, during the

late 1840s, 1850s and possibly beyond, he was closely involved in their production. Over 200 daguerreotypes mainly of Alpine subjects and architectural details are attributed, directly or indirectly, to Ruskin. 125 of these are extant and have been connected to Ruskin for some time. A further 121, possibly dating from Ruskin's visits to Venice in the late 1840s up to 1852, together with 14 salt prints, which surfaced in 2006.

John Ruskin was born on 18th February 1819 at 54 Brunswick Square, London. He was the sole offspring of a wine merchant father and an Evangelical mother. As a youth he was privately tutored at home, visited a number of art masters, developed a passion for the works of Turner and travelled in Britain and Northern Europe with his parents. In 1836 Ruskin became a Gentleman Commoner at Christ Church, Oxford, which considerably extended his education and social circle. He won the prestigious Newdigate Prize for Poetry but poor health delayed his graduation. However by 1843, the first volume of *Modern Painters* had been published by "A Graduate of Oxford."

Ruskin had an extraordinarily large and varied network of associates and followers, a significant number of whom were involved in photography. One of these associates was John Henry Parker, an antiquarian who sold photographs of archaeological investigations in Rome to Ruskin in 1874, which subsequently featured in Slade lectures. For a substantial period Dante Gabriel Rossetti, a founder member of the Pre-Raphaelite Brotherhood, was an ardent follower of Ruskin. Rossetti, similarly to Ruskin, used photographs as visual aids and, at his family home in Chelsea, posed with Ruskin and the artist William Bell Scott for William Downey on 29th June 1863. Despite the appearance of relaxed conviviality suggested by many of the photographs from this sitting, Ruskin expressed his dissatisfaction with his appearance and Scott later candidly revealed his dislike of Ruskin in his 1892 autobiography. Some of the many others whom Ruskin knew included Jemima Blackburn (née Wedderburn) who conducted early experiments with photography and Richard Calvert Jones who, like Ruskin, was taught drawing by James Duffield Harding.

In large part because Ruskin was passionate about art and traditional crafts and turned his visually attuned mind towards mineralogy and botany among other subjects, he had an aversion to the idea of progress expressed in Thomas Macaulay's *History of England* (1843–60), the geological revelations in Charles Lyell's *The Principles of Geology* (1830–33) and the ideas of history contained in Charles Darwin's *Theories of Evolution* (1859). Although early photography was a fundamental breakthrough, Ruskin was able to embrace it because it was tangible rather than theoretical and, above all, it captured the kind of singular detail that Ruskin craved in art, architecture and landscape scenery.

In a letter to his father in October 1845, Ruskin described the daguerreotype as a blessed invention. He was purchasing daguerreotypes by the end of his Normandy tour in 1848 and took his own photographic equipment to Switzerland in 1849 and, with his new wife Euphemia (née Gray) to Venice in 1849–50. On 24th February 1850 she described Ruskin in St. Marks's Square "with a black cloth over his head taking daguerreotypes" (Mary Lutyens, *Young Mrs Ruskin in Venice*, New York: Vanguard Press, 1965, 146). At this time Ruskin was assisted by his factotum John (known as George) Hobbs (later Hobbes) who was in Ruskin's service until 1854. In Hobbs' notebook entry for 1st May 1849, there is a suggestion that he not only carried the photographic equipment for Ruskin but also prepared and developed the plates. This may have been a pattern that Ruskin continued with his new factotum, Frederick Crawley, who was photographing with Ruskin in the Alps in 1854. This would have freed Ruskin to select viewpoints, consider compositional matters and check focus. However it is possible that Ruskin was more involved in photography than this interpretation allows.

Typically these dDaguerreotypes are 6" × 8" and there is at least one example, Richard St. John Tyrwhitt's painting *Mer de Glace* of c. 1859, that was almost certainly based on a Ruskin daguerreotype. Whether Ruskin was the first to photograph the Matterhorn, as William Gershom Collingwood claimed in 1884 is debatable but in *Praeterita* (1885–89) Ruskin stated that he was among the first. Looking back over almost forty years he discovered that his daguerreotypes recorded the ebbing of glaciers. In a similar vein, the 1883 Epilogue to *Modern Painters* contains Ruskin's observation that photographs of St. Mark's in Venice demonstrated that his own "careless" sketch for plate VI of *The Stones of Venice* had omitted the entasis of the tower.

Ruskin recommended photographs as an aid to drawing and cited Charles Thurston Thompson's reproduction of Raphael's *St. Catherine* as a model. He also included photographic reproductions in some of his publications such as the Autotypes in the 1890 edition of *Val D'Arno* and Carlo Naya's photographs of paintings in the 1890 edition of *Giotto and his Works in Padua*. However Ruskin could be critical of photography, remarking in *The Elements of Drawing* (1857) that shadows were rendered much darker than they should be. He was also concerned that colour photography would also bring further distortions.

The 1870s brought Ruskin joys and sorrows. He moved to Brantwood, an idyllically situated house in the Lake District. However the deaths of his mother in 1871 and, in 1875, the death of Rose La Touche, the young woman he had hoped would become his second wife, signalled Ruskin's gradual retrenchment from intellectual life. Between these two bereavements, in September

1873, Frank Meadow Sutcliffe photographed Ruskin, followed by Lewis Carroll in 1875. William Jeffrey captured an early Ruskin portrait in 1856 and Ruskin sat for Caldesi in 1862. By the time John McClelland photographed him in the 1890s, Ruskin had been broken by a legal battle with Whistler but had completed his autobiography. Ruskin died in 1900 and was buried at St. Andrew's in Coniston. He is commemorated in Poet's Corner, Westminster Abbey.

JANICE HART

Biography

Ruskin was born in London in 1819, the sole offspring of a wine merchant father and an Evangelical mother. As a youth he was privately tutored in art and a wide range of subjects and travelled widely in Britain and Europe with his parents. He went on to Christ Church Oxford in 1836, won the Newdigate Prize for Poetry but sat for his degree much later than expected because of ill health. In 1843, inspired by the works of Turner and the new generation of Pre-Raphaelite artists, he produced *Modern Painters*, the first of five volumes of art criticism inflected, like most of his later writing, with social commentary. He was a prolific writer, eloquent lecturer (both before and after he became the first Slade Professor of Fine Art in 1869) a productive artist and an occasional designer. He also took a keen interest in photography producing (or overseeing the production of) upwards of 200 Daguerreotypes, many taken in Italy during an 1849–50 a tour with his new wife Euphemia (née Gray). The trajectory of Ruskin's interest in photography began with the Daguerreotype and, over a period of sixty years encompassed photography's numerous technical, artistic and social transformations. Ruskin's early enthusiasm for photography's ability to render singularity of detail, particularly architectural and landscape detail, gave way to a criticism of photography's tonal rendition and later, a questioning of photography's capacity for artistry and an apprehension concerning the likely distortions of colour photography. These shifts in opinion give considerable interest to Ruskin's various references to photography because he can be seen as a barometer, if an idiosyncratic and sometimes aberrant one, of changing public attitudes. Ruskin occasionally included photo-mechanical prints in his publications such as the Autotypes which appear in the 1890 edition of *Val D'Arno*. Ruskin also sat for a large number of photographers including William Jeffrey, William Downey and Frank Meadow Sutcliffe. The ill health that troubled him whilst an undergraduate student developed into a number of physical and mental complications, particularly from the 1870s following the deaths of his mother and the woman he had hoped would become his second wife, Rose La Touche. Ruskin went into semi retirement in the last decade of his life at Brantwood, the house he purchased in the early 1870s. He died there in 1900, one of the indisputable sages of the nineteenth century. He is buried at St. Andrew's at Coniston and commemorated at Westminster Abbey.

See also: Dodgson, Charles Lutwidge (Carroll, Lewis); Daguerreotype, Jones, Calvert Richard; Downey, William Ernest, Daniel, & William Edward; Naya, Carlo; Parker, John Henry; Rossetti, Dante Gabriel; Sutcliffe, Frank Meadow; and Thompson, Charles Thurston.

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RUSSELL, ANDREW JOSEPH (1832–1909)

American photographer

The building of the first transcontinental railroad by the Union Pacific and Central Pacific Railroads generated an enormous interest among the American public creating both a market for photographic images of Western America and a means for photographers to transport bulky equipment to remote regions. Andrew Joseph Russell was the official Union Pacific photographer in 1868 and 1869 and one of many to follow who took advantage of this interest in the railroad and the sights along the line. He took over 250 large-format glass-plate negatives and 500 stereo-view negatives mostly in Nebraska, Wyoming, and Utah. Some of these images are classics of 19th Century American photography including one of the best-known images in American history (for years misidentified as a C.R. Savage photograph) of the two

Russell, Andrew Joseph. Slave Pen, Alexandria, Virginia. *The Metropolitan Musuem of Art, Gilman Collection, Purchase, The Horace W. Goldsmith Foundation Gift, 2005 (2005.100.91) Image © The Metropolitan Museum of Art.*

locomotives of the Union Pacific and Central Pacific Railroads coming together at Promontory, Utah at the Golden Spike Ceremony.

Russell was the natural choice when the Union Pacific decided to photographically document, The Work of the Age. Russell was a New York State native who moved from Nunda, New York to New York City in 1859 where he was a painter and portrait photographer. During the Civil War he was assigned as a special assistant to the Military Railroad Construction Corps for the Union Army. Most of his images documented the construction of military railways and his photographs were often rushed by special messenger to Secretary of War Edwin M. Stanton in Washington D.C. Russell as well photographed the battle of Fredericksburg and took a few stereo-views, and some Russell photographs have mistakenly been attributed to Matthew Brady.

After the war Russell returned to New York City to resume his work as a portrait photographer and artist. For whatever reason, Russell was not hired immediately after the war and the Railroad used the Chicago, Illinois photographer John Carbutt instead. Given, however, Russell's background in railroad photography and the fact that most of the Union Pacific executives were former Union Army officers, he must have seemed a better fit. Russell began photographing the Railroad headquarters in Omaha, Nebraska in early 1868 and he caught up with the construction crew in Cheyenne, Wyoming. He followed its frenzied pace across Wyoming, into Utah, and finally to the site where the Union Pacific and Central Pacific lines came together at Promontory, Utah on May 10, 1869. There were three photographers (the other two being C.R. Savage and Alfred A. Hart) at the Golden Spike Ceremony. The photographs taken were, not surprisingly, mostly devoid of the workers who built the railroad (Irish-Americans for the Union Pacific and Chinese-Americans for the Central Pacific). Instead they show the railroad officials, financiers, and dignitaries who were invited to the event. Afterwards Russell traveled to Sacramento along the Central Pacific line taking a handful of images as he went. Before returning to New York City, he photographed across Utah and Wyoming again, but this time at a more leisurely pace.

Russell showed a great deal of flexibility as a photographer. The twenty-three large-format images published by the Union Pacific in *The Great West Illustrated in a Series of Photographic Views Across the Continent* (only a handful of which exist today) portray the builders of the railroad in heroic terms. They evoke awe of the work done and convey both movement and power. The thirty images utilized in a book published by geology professor Ferdinand Hayden one year later entitled *Sun Pictures of Rocky Mountain Scenery*, however, are not dramatic images but instead are scenes of geological interest. Hayden was in charge of the U.S. Geographical and Geological Survey and wanted to promote the study of geology in Western America. Most of these photographs were taken after the joining of the rails when Russell had more time to pick and choose his subjects. In these photographs nature is not an obstacle to be overcome, but a source of interest to the traveler. Neither of these books, however, had a wide distribution and the general public viewed the building of the transcontinental railroad through stereo-view series published by Russell initially and later without attribution by Stephen Sedgwick and O.C. Smith. These images are surprisingly mundane.

Taken as a whole, however, the stereo-views create a visual catalog of the workers, tunnels, bridges, buildings, railroad engines, and new towns of the Union Pacific and satisfied the demand by the public for photographs instead of artwork (whose accuracy was suspect to many Americans) of the American West.

Russell's artistic background is shown in his large-format views by the careful composition and thoughtful placement of the railroad within its natural surroundings. The images provide a human perspective on what for Russell must have seemed an impossibly forbidding landscape. A number of photographs show figures contemplating the railroad from a high vantage point. These views reinforce the idea of the railroad as conquering the great distances of the American West, but also in a precarious balance with the natural forces surrounding it. Russell was, as well, a pioneering photographer. Although his equipment did not allow him to stop action, he did attempt to set up scenes as if he were capturing the daily work of the laborers. Many of his photographs were, as well, made into wood-cut illustrations and printed in weekly magazines.

Russell was the first of many photographers, including William Henry Jackson, Charles Roscoe Savage, Carleton Watkins, and Eadweard Muybridge who photographed both the Union Pacific and Central Pacific Railroads. Russell provided scenes which were bought by an Eastern audience eager for images of what was still then considered an exotic and romantic place. Surprisingly, however, there is no evidence that Russell ventured to Western America again in his lifetime.

DANIEL M. DAVIS

Biography

Andrew Joseph Russell was born on March 20, 1829 and grew up in Nunda, New York. As a young man he was a painter and a teacher at the Nunda Literary Institute before moving to New York City in 1859 where he worked as a panorama painter and a portrait photographer. During the Civil War, Russell became the official railroad military photographer for the Union Army. He returned to New York City after the war, but soon thereafter traveled west to start documenting the construction of the Union Pacific Railroad through Nebraska, Wyoming, and Utah. He is best known for the 250 large-format images he took of the building of the transcontinental railroad in 1868 and 1869 including one of the most famous images in American history, that of the two railroad engines of the Union Pacific and Central Pacific coming together at Promotory, Utah. He also took over 500 stereographic negatives during these two years that were actually seen by a larger audience at the time. Russell earned a good salary from the Union Pacific for over two years, yet others gained more materially from his images as his stereo-views were later issued without attribution. In the 1960s a cache of glass-plate negatives were discovered at the American Geographical Society and his large-format views became better known. After photographing the railroad, Russell returned to New York City and worked as a portrait photographer as well as an artist for the magazine *Leslie's Illustrated*. He died on September 22, 1902.

See also: Savage, Charles Roscoe; and Watkins, Alfred.

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RUSSIAN EMPIRE

The first information about the invention of Daguerre reached Russia already on 4th January 1839 (according to the Julian calendar). It was followed by active discussions in the press of the future perspectives of photography. A special emphasis common for all participants to these discussions was made on the documental character of daguerreotypes. But the evaluations were in fact different. The new invention did not fail to interest the scientists from St. Petersburg Academy of Sciences. In April of 1839 academicians (biologists) Karl-Ernst Bar (1792–1876) and Fyodor Brandt (1802–1879) asked the corresponding member of the Academy of Sciences, Josef Hamel (1788–1862) to get acquainted with the new invention in the course of his business trip abroad.

First Hamel went to London and got acquainted with Talbot and his invention. In May of 1839 Hamel sent to the Academy the description of Talbot's method and a couple of photos, which were of bad quality. The Academy Assembly therefore committed a task to Julian Frizshe, an academician (1802–1871) to survey the calotype method. The academician informed on the results of his research work on the 23rd of May of 1839 and demonstrated the picture of herbarium, which he made by using the method of photographic recording (photogram). In the course of his work on these pictures

he streamlined the method. This was the first scientific research of photography made in Russia.

Meanwhile, Hamel moved from London to France and got acquainted with Daguerre. He sends to the Academy the description of daguerreotype method along with the equipment necessary for making photos, including the camera, before the sale of these things started. The discussion devoted to this technology in the academy of sciences was held on the 6th of September of 1839. In 1839–1841 Hamel recurrently sent to St. Petersburg new photos, including those made by Isidore Niepce—these were the views Louvre and other buildings. Later in 1850 Hamel received from Isidore Niepce the originals of documents (168 in number) on the history of inventing photography, which after Hamel's death in 1862 were transferred to the Academy Archive.

In Russia, like everywhere in the world, daguerreotypes gained great popularity. The first daguerreotypes brought to Russia were exposed in shop-fronts and attracted the interest the of public at large. In 1839 the first booklets by Nickolai Stepanov appeared describing the methods of Daguer and Talbot, the cameras, and other necessary photographic equipment went on sale. One of the first photographic amateurs to appear was Franz Teremin (1802–?), a lieutenant colonel of the Ministry of Lines of Communication, was interested in daguerreotypes, and made a photograph of the Isaac Cathedral in St. Petersburg with 25 minutes time-exposure in October 1839. In 1840s Count Alexei Bobrinski made a photograph of the conservatory in his house in St. Petersburg. In 1843 Sergey Levitski (1819–1898) being on a trip made photographs of views of the Caucus. In mid-1840s an unknown photographer recorded the sculptures by Ivan Vitali before they were mounted onto the facade of the Isaac Cathedral.

Since 1840s professional daguerreotype studios for making portraitphotographs started to appear. The style of these works was predetermined by the style of painted miniatures, which were very popular at the time. The latter was imitated in daguerreotypes decoration and in by-hand colouring of the black and white photos. The genre of photo-portraits formed the commercial basis for future development of photography.

The first professional daguerreotype specialists working in Russia came from abroad. All of them had already worked in various cities of Europe. They were, Josef Weninger from Wien, the Schneider brothers and Carl Dautendey from Germany and among others.

Some of them set up permanent studios, while others traveled round the country. For instance, D'Avignon made several trips to far away cities of Russia in 1843–45s. In 1845 he made photo-portraits of insurrectionists against the emperor in December of 1825 who spent their life banishment in the suburbs of Irkutsk in Siberia. As this information reached the Third Department of the Emperor's Office (dealing with state crimes and prisoners) the photographer was arrested for making photographs of state criminals. Soon afterwards the photographer was released, the daguerreotypes were confiscated and destroyed and since then taking photographs of criminals was strictly prohibited. However some of the daguerreotypes preserved by some miracle are now part of the collection of the Historical museum. Thus, the authorities estimated the documentary value of photography very high right from the beginning.

Among the first Russian professional photographers one could name Alexei Grekov, who opened a studio in 1840. He made and sold self-constructed daguerreotype apparatus, he employed Boris Yakobi's method for silver-plating copper and brass photo-plates. Such photo-plates were cheaper than the ones completely made of silver. At the meeting of Paris Academy of Sciences in November of 1840 Arago made a report on his method of producing photo-plates.

Most of the Russian professionals in daguerreotype started to work in 1850s and by 1860s they fully replaced the foreigners. Many of the Russian daguerreotype masters were graduates of the Emperor's Academy of Fine Arts, which produced high artistic value of the works. The industry of the studio portrait actively developed in Russia.

In 1850s the wet collodion photo-process started to be widely used in Russia and soon enough it ousted daguerreotype although this was the way people continued to call it: a daguerreotype on paper. In 1850s Andre Disderi started to make cartes de visite, which made this genre extremely popular with the public. It became popular in Russia to have an album of photographic family portraits.

In 1850 Andrei Denier (1820–1892), a graduate of St. Petersburg Academy of Fine Arts opened his famous studio. He became a true master of photo-portraying; the artists Ivan Kramskoi and Petr Sokolov worked in his studio for some time as retouchers. In 1865–1866s Denier publishes photographic albums of portraits of famous people (Russian writers, artists, scientists, etc.) 12 photographs in each and this was one of the first photographic editions in Russia. The aesthetics of painting, which was then applied to photography, called for a soft optical image. In order to achieve it Denier worked out an original technique of printing from two negatives of different density. He patented this technique in 1873 for three years. Recent researches made it clear that this method had been employed by foreign photographers earlier (which proves that Denier's invention was not the original) but nevertheless Russian photographers keep calling it "Denier's effect"and prominent Russian masters of photography, such as Sergei Levitski (1819–1898), Andrei Karelin (1837–1906), used the method successfully.

The thing of particular interest at present is the early outdoor works. Despite the considerable technical problems accompanying outdoor photography, photographers were often asked to join scientific expeditions to do the job previously assigned to artists. They were to record the results of research, photograph the nature, the nationalities inhabiting the region, to work in the combat area documenting the ongoing events.

Widely known are the photographs made by Roger Fenton: he photographed the Russian fortifications being destroyed during the Crimean War of 1854–1855s. The Russian photographers also made photographs of the aftermath of the battles, scenes in the camps. C. Kolpaktchi, for instance, made a panorama of destroyed Sevastopol consisting of several photographs.

The work which attracts much attention is the one by an unknown photographer who made a photography of a church procession in Moscow Kremlin in 1858. In this work there was something of a photo-report—a recording of an interesting event.

The main task of outdoor photography was to record the scene or object as closely to the reality as possible. The photography was a assigned the auxiliary role of a scientific document. In 1850–1860s Nikolai Vtorof, an ethnographer, applied photography to create an ethnographic map of Voronezsh region (he invited Michail Tulinof (1823–?)to do this job for him). Vtorof presented the results of this work at the meeting of Russian Geographic Society in 1857. In 1867 The Natural Science Society of Moscow Emperor's University organized an all-Russia Ethnographical Exhibition. This exhibition housed more than two thousand photographs of different nationalities, scenes of their life and views of the region. Photographers joined expeditions and missions were recording of the events was needed.

In 1858 in the course of the diplomatic mission to Khiva and Bukhara second lieutenant Anton Murenko (1837–1875) made photographs that composed a unique album "From Orenburg through Khiva and to Bukhara." Here were the scenes of life of the mission on trip, scenes of life of local people and the surrounding landscapes. For this work Murenko was awarded a silver medal of Russian Geographic Society and afterwards he became a professional photographer. Then Murenko got a task from Russian Geographic Society to compose albums of ethnography and views of different regions of Russia. On opening a studio in Saratov in 1861 he was the first to start purposefully making photographs of Povolzshje.

In the second half of the 1860s a Russian photographer Michail Nastjukof made lots of photographs of the Volga region and in 1866–1867s he issued an album "Views of Volga from Tver and up to Kazan."

More and more photographers started to make outdoor photos. An interesting ethnographic photo-work was carried out by W. Carrick (1827–1878) in 1870s. In the 1870s ethnographic photography was also practiced by J. Raoult, a photographer from Odessa. He worked in Simbirsk region, made photographs of inhabitants of Moldova and Ukraine. A huge photographic collection of valuable material on Central Asia was composed under the supervision of A. Kun, a researcher, in 1874. The album comprised four volumes and contained over 1200 photographs. For this album the author won one of the highest awards at an International Geographic Exhibition in Paris in 1875.

All these works were applied in science and their value depended on the exactness of rendering of this or that object or scene by means of photographing. The emergence of association for mobile exhibitions (the so called peredvizhniks trend in art) in 1870 conduced to finding artistic value in documental photography as these artists in the majority of their pictures recorded some moments of real life as if fixed down with a photo-camera.

Thus photographs made in 1869 by Josef Migurski a fellow member of French photography society, the author of the first textbook on photography in Russian in 1859, made photographs of construction in Odessa, which echo the paintings by Konstantin Savitski "Repairs at the railway," 1874.

Nevertheless it should be mentioned that artistic photography is a term more applicable to studio photography (including studio photographic portraits). The photographer arranged the setting in accordance with the laws of painting, achieved the desired lighting through a complex system of reflectors, used a variety of studio accessories, strived for the ways of making the image softer at the expense of documental exactness, and at times just copied famous paintings.

A widely acknowledged master of Russian pictorial photography of the second half of the 19th century is A. Karelin. His followers and students, like for example Stepan Solovjov (?–1908) and others searched for the expressive means in photography taking the aesthetics of painting as a starting point.

The static character of studio photography had to be overcome. The attempts to do it were made by Konstantin Shapiro (1840–1900). In his photo-series devoted to the novel by Gogol "Notes of a madman" he recorded performance by Vasili Andreev-Burlak. Each photography in the series corresponded to a definite moment in the context of the monologue. The album was published in 1883, it consisted of 30 photographs and today we perceive it as a set of expressive shots from a silent film with titers.

A considerable progress in the development of photography, the documentary photography in particular, was prompted by the emergence of dry bro-gelatine plates in late 1870s. The events of the Russian-Turkish war of 1877–78s were recorded by such photographers

as A. Ivanov, M. Revenski, D. Nikitin, V. Barkanov and others. In the 1880-s photo-recording of various events became quite frequent. Alexei Ivanitski made a photographic document of the crash of the Tzar train in 1888. But these works were a long cry from the real photographic reports. Photographers kept concentrating on static scenes. Their attempts to reflect the dynamics of the event were still rather shy.

Lieutenant N. Apostoli made marine photographs with the help of a double camera he constructed in 1890. Apostoli outlined his experience in the "Guidance for studying practical photography for naval officers and tourists."

The documentary photographs were badly needed by the illustrated. At that time they still published photographs engraved by artists. But even in the copies made by artists one could easily trace the photographic basis. The demand for such photographs went steadily up. The photo-images were often used by artists involved in battle painting: they introduced some of the documental details rendered by photographers into their works.

In the 19th century painting in Russia the peredvizhniks were obviously domineering. This surely told on photography: the leading tendency consisted in rendering the surrounding world realistically by purely photographic means. The concept of free photographic setting kept gaining weight. The plots were often taken from regular life of common people, not necessarily some extraordinary scenes but also a most routine ones.

One of the prominent proponents of realistic photography was Maxim Dmitriev (1858–1948). The most outstanding of his works was the album "Year of Poor Crops of 1891–1892 in the Nijnij Novgorod Province." The woes of people suffering of severe drought and epidemics of typhoid and cholera were the center of the first photo-publicist report in Russia.

The method similar to photo-documentary was also employed in literature. It helped to transmit the realistic message and make the plot more close to reality. Thus, for example, the famous Russian writer Anton Chekhov (1860–1904) visited Sakhalin in 1890 and in his literary work "The Island of Sakhalin" first published in 1895 the writer rendered with photography-like exactness all the details of the way of life of convicts and exiles. The basis for this description was laid down by his observations and a series of photos.

In 1890s Alexei Kuznezov (1851–?) a convict confined to ten years in the Zabaikalje region for revolutionary activities, created an album called "Views and Types of the Nerchinsk Servitude." Documentary photographs of the late 19th century made Dmitri Jermakov (1845–1916) one of the first photographers of Georgia. His diverse photographic legacy included landscapes, architectural monuments, scenes of life of different nationalities from Georgia, Armenia, Persia. His studio on Tiflis (at present Tbilisi) one might consider a prototype of a photo-agency of today. In 1896 Jermakov issued his "Catalogue of photographic views and types of the Caucus, Persia, The European and Asian parts of Turkey." It comprised over 18 thousand images and anyone could order the view he liked for a fee. Jermakov made studio ethnographic photos: the sitters dressed in the national costumes played the moments of their real life. The photographer admired both the picturesque moments and the routine situations and fixed them down in a short period of time.

In all these works one could trace the starting point of the contemporary understanding of photography. According to this understanding the realistic rendering is an artistic document, which does not simply reflect but influences the reality. Masters like that were the ones who predetermined the concept of specifics of photography.

A considerable part of photographic legacy is constituted by landscape city shooting. Many photographers especially from 1870s on recorded the sights of the home town. The photographers were particularly attracted by large cities such as St. Petersburg, Moscow, Nizhni Novgorod and some others.

A large-scale shooting of Moscow and its suburbs was carried out by Albert Meighm in1870–1880s under the task of one of the Moscow leading bourgeois, Nikolai Naidenov. As a result an album appeared, which comprised the photographs of architectural monuments and vies of the streets in the city. It should be mentioned that these works were not aimed at rendering the city's life. In 1890–1900s Petr Pavlov carried out a shooting of Moscow; he focused primarily on genre and view photography. In his works architectural monuments were recorded on the background of the vigorous city life.

In the 19th century photography was actively used to solve scientific problems and execute applied tasks. The first Russian photographer who made photographs of Russian style buildings and period pieces was Ivan Barschevski (1851–1948). He made a great number of photographs of architectural monuments, archeological objects and different ancient pieces from museums for the purpose of future scientific research.

Another vivid example of applied use of photographs is the research works by Jevgeni Burinski (1849–1912), who employed photography in court litigation. In 1886 he worked out a method of layer by layer restoration of image (colour-separating method), which allowed to read spoiled manuscripts and inspect the documents if there is a doubt in their authenticity. In 1894 he used this method in his work in the Emperor's Academy of Sciences—he studied leather documents of the 14th century.

Pictorial photography in Russia was also pushed forward by amateurs (first amateurs appeared already

in 1839). The number of photo-amateurs went up rapidly in the 1880–1890s, which is connected with wide spreading of brom-gelatine plates and simplification of the process of photography. Since 1890s lots of societies of photo-amateurs of different levels emerged in Russia. By 1917 they amounted to over a hundred.

Many of the amateurs were also keen on music, painting, literature, which had an impact on their creative work as photographers and formed the basis for a homogeneous cultural environment of the nation.

One of the first and the most respected photo-amateurs was Ivan Nostits (1824–1905), count and lieutenant general. He started to go in for photography in 1839; he later made photo-portraits of the Emperor's family, ships, landscapes, architectural monuments. In 1859 he made the photographic portrait of the famous prisoner, the Chechen imam Shamil. He tested photo-apparatus and published the results of his research works in special journals. In 1896 he issued an album "Photographs by count Nostits." The earnings he donated to the fund of the Penkov orphanage in Yekaterinaslav region.

The problems of photography were the topic of several works by an outstanding Russian scientist and evolutionist Kliment Timiryasev (1843–1920). He drew parallel between photography and the process going on in leaves o plants. Besides he was among the first ones to realize how important foe physiology was the invention made by Hermann Wilhelm Vogel—his optical sensibilizators. Timiryasev used to say that the most fascinating photo-process is the decomposition of carbon dioxide and the formation organics in the plants under light and the sensiblizator—chlorophyll. The scientist was also a passionate photo-amateur, he was knowledgeable in the theoretical as well as in practical achievements of photography. He pictured landscapes and was a master of the genre. By the best of his works he proved that photography is an art.

Among Russian photo-amateurs Alexei Mazurin(1846–?) is most widely known in Europe. In 1890s his works were published in journals of Germany, Great Britain and other countries. He was one of the Russian pioneers of pictorialism, the leading trend in photography on the verge of the 20th century. He learned how to perform positive printing, got acquainted with the gum dichromate and the pigment method.

There were women photo-amateurs, for instance Natalia Nordman-Severova (1863–1914), the wife of a famous Russian artist Iliya Repin. She was the head of the Ladies' photographic society. Her amateur photographs were used by Repin in creating the great painting "The State Council."

Leo Tolstoy's wife Sophia was an amateur photographer, so she made a photographic chronicle of the writer's life.

The thing that contributed to the spreading of knowledge of photography was the photo-periodicals. This can be subdivided into issues of public photographic organizations, independent editors, journals of trading firms, non-photographic journals, which published materials on photography.

The majority of articles tackled the technical problems of photography. The question of the artistic value of photography was less widely discussed also there were several declarative publications stating that photography was a form of art.

The aesthetics of photography started to gain prominence in the end of the 19th—the beginning of the 20th century especially as soon as pictorialism spread in the country.

Photography was first used as an illustration by an artist Vasili Timm (1820–1895), who published from 1851 to 1862 the so called "Russian Pictorial Gazette," although the photographs were copied by hand. In Russia there were photo-journals: "Svetopis" (Photography) issued in 1858–1859s; "Fotograf" (Photographer) issued in 1864–1866; "Fotograficheskoje obozrenije" (Photography review) issued in 1865–1870s.; the "Fotograf" journal (1880–1884s) was an organ of the fifth department of the Emperor's Russian Technical Society (ERTS; there was also "Fotograficheski Vestnik" (Photography Gazette) issued in 1888–1897s; "Fotograf Ljubitjel" (Amateur photographer) issued in 1890–1909. The best artistic and theoretical journal, "Fotograficheski Vestnik" was a press organ of Russian Photography society in Moscow in 1907–1918s. The journals housed publications on new achievements of photographic process, events in the life of Russian and foreign photography, reviews on photographic literature, information on exhibitions and other important things. The journals not only unified the Russian photographers, they also kept society informed on culture-specific questions.

In 1890s photography started to be actively used in periodicals, which entailed the emergence of photographers oriented on making reports. The considerable sums of money they got as honorariums allow them to go in for this kind of photography.

The title of the king of report is best suited to Karl Bulla (1853–1929). Together with his sons he made photographs for journals and news-papers rendering the events that were taking place in St. Petersburg. Over 100 thousand negatives made by the Bulla family reflect the way Russia lived in the end of the 19th—the beginning of the 20th century. They did not lie in the advertisement that ran as follows: "An experienced photographer-illustrator, K.Bulla, St.Petersburg, Nevsky 48. Makes photographs for illustrates on the current events. Makes photography of anything you might need, anywhere, feeling free in any surroundings be that a region, a build-

ing, be it in the day-time or at night." The exactness of a photographic report was socially relevant and more convincing than a verbal description. That's why the public kept demanding for more and more photographic information.

The 19th century is the time of emergence and maintenance of photography all over the world and in Russia in particular. Besides it is the time when photography gained the status of a form of art.

In the end of the 19th century and the beginning of 20th century (up to the revolution of 1917) there were two trends for development of photography in Russia. The bulk of photographers believed in the principles of realistic photography, employing the latest achievements of photographic technology. The proponents of the trend, and Sergei Prokudin-Gorski most active among them, called to stay documental and use natural colours. The latter worked on a large project—a series of coloured photographs of Russian sights. The results of the work were used for studies as well as for research.

Another trend especially active in the beginning of the 20th century was the pictorial photography. Within the framework of this trend the photographers studied the problems of creating an artistic image, worked on such matters as composition and lighting. The photography developed on the background of changing priorities in Russian painting, These trends formed the basis for the Soviet photography of the 1930s, which combined expressive imagery and documental exactness.

Russia before the revolution of 1917 was integrated into the world economy, politics and culture and carried out one of the leading functions in the development of the world. That is why Russia had a worthy position in the global process of photography development.

ALEXEI LOGINOV

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RUTHERFURD, LEWIS MORRIS (1816–1892)

He was born in New York City and graduated in Laws from Williams University in 1834. Between 1837 and 1849 he practiced as a lawyer. He was a passionate amateur in astronomy, and has a special place in both histories of photography and astronomy as a pioneer of the photography as a tool of the astronomer. The beginning of spectroscopy (1830) and photography (1839) opened the horizon of astronomy, that traditionally studied the position of the stars. From that moment a new branch was inaugurated, the physical astronomy, or more commonly known as astrophysics.

With this starting point, chemists and physists began to point instruments at the stars searching for new data and the photography was called to play a fundamental role, when allowing a faithful, reliable and lasting registry of the celestial phenomena. Today this period of astronomy is known as "New Astronomy"; and Rutherfurd was one of its pioneers, together with Norman Lockyer (1836–1920) in England, Jules Janssen (1824–1907) in France, father Angelo Secchi (1818–1878) in Italy and Hermann W. Vogel (1834–1898) in Germany. Rutherfurd developed special lenses, altogether with the optician and daguerreotypist Henry Fitz. This allowed to focus on the wavelengths involved in the photochemical process of the humid collodion plates, that is the blue, the violet and the ultraviolet.

In 1860 he established in New York an observatory with a great equatorial refractor telescope, with an objective of 33 cm of diameter and a camera for humid colodion plates. He obtained photographic images of the solar disc, as well as of the Moon, some planets, stars and constellations. His images of the Moon became famous at the Universal Exhibition of Paris, in 1867. Some were reproduced in stereoscopy and in woodburytype, illustrating treatises of astronomy or photography (Flammarion, 1878 and Vogel, 1875) and a few in albumen paper, in great size—approx. 42 cm × 57cm—which were distributed to the main scientific centers and to celebrities and astronomers of the world.

When the American astronomer Benjamin A. Gould (1824–1896) accepted the invitation of the President of Argentina, Domingo F. Sarmiento to direct an observatory in the mediterranean city of Cordoba, Argentina, Rutherfurd trained the future Gould' assistant, a German scientist, Carl Schultz-Sellack to obtain photographs with his system, and gave Gould the first compound lens that were used in that observatory. (Ferrari, 2001).

Rutherfurd donated his instruments and photographs to the University of Columbia, of which he was a benefactor (1858–84).

ROBERTO FERRARI

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RYDER, JAMES FITZALLEN (1826–1904)

American photographer

James Fitzallen Ryder, an American photographer for most of the second half of the 19th century, learned the daguerreian process in his hometown of Ithaca, N.Y. from a self-styled "Professor" Brightly, who "assured me that I was a promising subject and would make a mark as a daguerreotypist," Ryder wrote in his memoir.

In partnership with Brightly, Ruder operated daguerreian rooms in Ithaca, then became a traveling daguerreian in southwestern New York, Pennsylvania and Ohio. He opened a gallery in a vacant Mormon temple in Kirtland for a time, and worked in Elyria, Ohio during the winter of 1850. He then settled in Cleveland, where he introduced the ambrotype to the city in 1855.

In 1862, under the commission of the Atlantic and Great Western Railway, Ryder produced a two-volume album of 129 photographs of the landscapes, towns, stations and sheds, bridges, cuts, and tracks associated with the company. By the late 1860s, Ryder was Cleveland's leading photographer.

In 1868 he helped introduce negative retouching to the United States when he brought a retoucher from Germany to the United States. Ryder was a founding member of the Photographers Association of America and became the group's first president in 1880.

BOB ZELLER

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SABATIER-BLOT, JEAN-BAPTISTE (1801–1881)

French painter and photographer

Appearing among the most famous portraitists of the Parisian daguerreotype of the 1840s, Jean-Baptist Sabatier is still today a poorly known figure among the historians of photography. There was a burst of production, accompanied by the absence of sources of files relating to him, and a scarcity of his name in the press, which make writing on him difficult.

He was born on January 31, 1801 in Lassur in Ariège. His parents wanted an ecclesiastical career for him, but his fragile health obliged them to withdraw him from seminary. Afterwards, he developed his artistic talents and became a miniaturist, located in Paris at 50 Palais Royal, exhibiting to the Salon on several occasions since 1831 (1835, 1837, 1839, 1841, 1843), always showing portraits of women. In 1838 he married Miss Blot and in 1839 their only daughter, Maria, was born; throughout the years of the 1840s, both were his favored models for daguerreotype portraits.

From the beginning of the 1840s he seemed to become part of the many painters of miniature attracted by the new medium of daguerreotype. During this period he became the pupil of the friend, Daguerre with whom he created at least two portraits, around 1844 (Rochester, George Eastman House and Société française de photographie). It is from 1842 that we find the name "Sabatier-Blot" on the reverse side of a plate of daguerreotype. The following year this name appeared for the first time under the heading "painter-artist," with "Palais Royal, 137." It was probably then that, assisted by his wife, Sabatier simultaneously practiced the two techniques, daguerreotype and miniature, even if the latter had become less favored. That year, Sabatier presented miniatures to the Salon for the last time however, he continued to be presented as "a painter in miniature, making portraits with the daguerreotype" until the 1850s.

Sabatier-Blot presented daguerreotypes at "l'Exposition publique des Produits de l'Industrie" ("Public exposition of Products of Industry") the following year and, according to its publicity, was awarded an honorable mention. The same year, "Sabatier-Blot" appeared for the first time with the heading "Daguerreotypes" and a different address (Palais Royal 163). He was explicitly mentioned as specialist in portraits.

He seemed to have been one of the most sought after portraitists of the capital in the second half of the 1840s. His works, abundant and scattered, are difficult to locate in their totality. They reveal a good technician, famous for perfectly polished plates, which were obtained using a machine of his own invention. Also demonstrated is a certain skill of composition which sometimes distinguished him from his competitors. Sabatier-Blot had access to the traditional accessories of the portrait studio of this period such as the pedestal table covered with a tablecloth or a carpet. The plain backgrounds made it possible to center the attention on the character and to cut out its silhouette more significantly. Perhaps the naturalness of the poses, often less stiff than in the majority of the works of this period, is particularly noticeable in the series of portraits which he left to his daughter and his wife and can explain the success of his studio.

At the end of the 1840s, Sabatier-Blot was still located at the Palais Royal but at a different addresses: Palais Royal 137 and Valois 27 (1848) then Palais Royal 129 (1849–58). The other addresses however appear on the back of various plates signed with his name: Palais Royal 43 or Palais Royal 132. In 1849 he presented portraits at the exposition of the Products of

Industry. His production was rewarded, even though the jury mentioned that the effects of light were too complicated, which harmed the simplicity and the clarity of the images.

The last exposition in which he seemed to have taken part was that of the Hook Deluxe hotel of 1851 where he presented only one portrait. The same year, he became a member of the new Société heliographique. At the time when the technique of collodion was established, his name was rarely mentioned: three years later, he appeared among the first members of the Société française de photographie although he did not take part thereafter in any of its expositions. He seemed nevertheless to continue to express interest in the photographic medium, and its technical aspects in particular. In 1857 he acquired a patent for an instrument that was easier to manipulate as it was "so simple that one hour is enough to learn photography." Then in 1863, he developed another apparatus to operate in the open air. Moving once again, his studio from to 1861 was located at 25 rue Neuve des Bons Enfants (25 street Neuve of the Good Children), and then from 1863 to 1871, at Valois 37. He continued to make portraits, in particular calling cards, and ended his activity at the beginning of the 1870s. He died in 1881.

Since his large body of work is very scattered today, the most substantial collection consists of a little less than thirty plates belonging to the George Eastman house in Rocheste. These images came from the collection of Gabriel Cromer, a member of family of Sabatier-Blot's daughter who married, in 1865, to another photographer, Victor Laisné. With the study of this collection, it appears that the best of his work was carried out in margin of his commercial activities such as a portrait of the chemist Jean-Baptist Dumas, probably from 1849–1850, and the many portraits, sometimes with the format full plate, which he created of his daughter and his wife starting from the middle of the 1840s. Sticking more to the expression and the character of his models than with their social status, these images are among the greatest successes of the portrait to the French daguerreotype portraits.

Quentin Bajac

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SACHÉ, ALFRED (c. 1853–1885)

India-based photographer

Commercial photographer, eldest son of John Edward Saché by his first wife, Alfred joined his father's photographic studio at Nainital in 1872, where he worked as an assistant till 1874. Working on a seasonal basis, he also opened his own premises in Benares in 1874, which he managed for one season till March 1875. The following month, he established another studio in the hill station of Kasauli, where he also became agent for the sale of his father's photographs. Between 1876 and 1881, Alfred's professional activity remains uncertain; the birth of his first child in March 1876 in Amballa and his second child in 1880 in Lahore suggests he may have worked as a photographer in both cities. In 1881, he opened a studio in Dalhousie, which he ran for a few years before traveling to Lahore again, where he possibly established the firm A. Saché & Co before he died in 1885. The firm continued till 1895, possibly run by his half brother John, who was John Edward Saché's son by his second wife Annie, and managed a studio in Lahore between 1886 and 1895. From 1896, the business A. Saché & Co was renamed Saché & Co and remained in activity till 1900.

Stephanie Roy

SACHÉ, JOHN EDWARD (1824–1882)

Prussian-born, Indian photographer and studio owner

Commercial photographer, born in Prussia as Johann Edvart Zachert, Saché arrived in Calcutta from the United States in late 1864, and entered into partnership with W. F. Westfield. Member of the Bengal Photographic Society, the firm Saché & Westfield won the silver and bronze medals at the annual exhibition of the Society, respectively in 1865 and 1866. While in partnership with Westfield, Saché opened his own independent studio at Nainital in 1867. He subsequently went into a brief partnership with a Mr J. Murray in Bombay in 1869. The same year, he made an expedition into the Himalayas, following Samuel Bourne's example. By 1870, Saché had ended his association with Westfield and concentrated on the running of season-based studios until his death in 1882: Mussoorie (from 1876) and Nainital during the hot months, Lucknow (from 1871) during the cooler months. In 1873–74, Saché made a series of views of Kashmir, which was to be the last group of topographical images he produced. Between 1874 and 1876, additional seasonal studios were opened in Meerut, Cawnpore and Benares, the latest being

Sache, John. The Taj Mahal, Agra, India.
The J. Paul Getty Museum, Los Angeles

managed by his eldest son Alfred. A number of talented photographers worked in Saché's studios, including G. W. Lawrie, with who he went into partnership as Saché & Lawrie between 1880 and 1882. During his twenty years in India, Saché traveled extensively throughout northern India, covering major sites and towns, and produced an accomplished collection of images, proving himself a master of the picturesque composition.

STEPHANIE ROY

SALTED PAPER PRINT

More concisely known as the salt print, the name implies the method of its preparation: fine quality paper was soaked in a dilute (ca. 1–2%) solution of common salt (sodium chloride) and dried. One side was then brushed over with a concentrated (ca. 20%) solution of silver nitrate, thus precipitating light-sensitive silver chloride within the paper fibres. Exposure to sun- or daylight through a contact negative caused a positive image in silver to print-out as minute particles of the metal trapped within the fibres of the paper surface. Such photographs on plain paper therefore carry no significant layer of colloidal binder; their matte surface distinguishes salt prints from those coated with glossy layers of hardened colloid, such as albumen, gelatin, or collodion**,** to bind the silver particles in suspension. Between these extremes there also exist intermediate examples of lightly colliferized prints.

The light sensitive chemistry of salt prints is essentially that of the first successful photographic process on paper: the photogenic drawing paper (q.v.) invented by William Henry Fox Talbot in 1834. The term 'salt print' is a later neologism (Hardwich 1855). Talbot originally stabilised his photogenic drawings with fixing agents—either saturated (ca. 32%) sodium chloride, or (ca. 2%) potassium iodide—but rather ineffectively, because the residual silver chloride remained slightly light-sensitive. Fixation with these halides was soon displaced by 'hyposulphite of soda' (still used today as 'hypo,' but properly, sodium thiosulfate), Sir John Herschel's innovation of 1839, which completely removed the excess silver chloride.

Salt prints fixed in a fresh hypo solution have a reddish- or yellowish-brown color that is affected by the paper sizing agent: the animal gelatin used for British papers afforded warmer image tones than the starch sizing of French papers. Such colors were commonly considered unpleasing, but with continuing use any hypo fixer bath was seen to yield more satisfying print colors of rich brown, as silver salts accumulated within it. This observation, publicised by Louis-Désiré Blanquart-Evrard in 1850, caused photographers to age their hypo baths artificially, by deliberately adding silver nitrate. The same effect was discovered in some cheaper substances: nitric acid, iodine, and iron(III) salts—all are oxidising agents that convert thiosulfate into polythionates, capable of *partially* sulfiding the silver image, to good effect. However, the optimum point of this procedure was very critical: if the paper were not fully washed free of excess fixer, it slowly converted the entire image to silver sulfide, with consequent fading

Benecke, Ernest. Vie de Gebel Mousir & Il Cataract du Nil regardant au nord-Nubie 72.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

to dull ochre. The enthusiastic but careless employment of these inexpensive "old hypo fixing and colouring baths" proved disastrous for the permanence of many salt prints.

A better procedure for toning salt prints had already been proposed in 1847 by P. F. Mathieu, who employed *sel d'or*—a complex thiosulfate of gold(I)—to protect the silver image with a deposit of gold metal, as used for gilding daguerreotypes since 1840. Encouraged by Gustave Le Gray's recommendation in 1850, many French photographers took to gold-toning, but its benefits were only publicised in Britain much later in 1855, by Thomas Sutton. His energetic advocacy in the *Photographic Journal* won over the leading photochemist Thomas Hardwich, who repudiated his earlier recommendation of the 'old hypo bath,' in the second edition of his *Manual of Photographic Chemistry* in 1855. In the same year, the Photographic Society set up a committee with the remit "to take into consideration the Question of the Fading of Positive Photographic Pictures upon paper." This so-called "Fading Committee" recommended—though not unanimously—that gold toning be employed. The 'old hypo bath' was not finally discredited until *ca.* 1858. By then, the fading of salt prints had become a chronic problem; for instance, those printed by Nicholaas Henneman from 1844 onwards, for Talbot's publication *The Pencil of Nature*, suffered from the use of 'old hypo' at the Reading Establishment, where inadequate washing procedures were occasioned by the intermittent and impure water supply.

Greater success with salted paper printing was enjoyed by the circle of Scottish amateur photographers based in St. Andrews, and by their professional brethren in Edinburgh, David Octavius Hill and Robert Adamson. Between 1843 and 1847 this uniquely fruitful collaboration produced thousands of salt prints of rich color that survive well today. Edinburgh Old Town was then affectionately known to the Scots as "Auld Reekie" and the ingress of the sulfur-polluted atmosphere sometimes caused fading at the margins, but the body of the print was usually unattacked. The stability of Hill and Adamson's salt prints may be attributed to their use of dilute fixer and very thorough washing—24 hours was usual—to ensure complete removal of residual thiosulfate.

Three other improvements to Talbot's original formulation for photogenic drawing paper have proved worthy of note:

1. The 'ammonio-nitrate of silver paper' devised by Alfred Swain Taylor in 1839, which yielded a more neutral print color, and was easier to fix.
2. The inclusion of sodium citrate in the salting solution to absorb the chlorine produced photochemically, which otherwise reversed the reaction by re-oxidising the silver image; this became a standard additive to all later printing out papers.
3. Immersion in dilute sodium chloride before the hypo fixation bath, to precipitate any remaining soluble silver nitrate, which could otherwise cause brown stains of silver sulfide by oxidising the thiosulfate.

Salted paper was the principal medium for photographic printing throughout the 1840s and 1850s; but it was slowly displaced by a shift in public taste towards albumen paper, which had first emerged around 1853, and achieved commercial dominance by the end of the decade. From an esthetic viewpoint, the salt print was seen as the positive complement to Talbot's calotype paper negative process, thus sustaining the artistic ethos of 'photography on paper' as the medium of the gentleman-amateur. The fibrous paper substrate had the optical effect of diffusing the image to a softened 'impressionistic' look, much favoured for landscape. On the other hand, the sharp albumen print was the ideal positive counterpart to the highly resolved wet collodion negative on glass, and the medium of choice for portraiture by professional photographers. The artistic sentiments attaching to plain paper photography may also have stimulated the temporary revival of the salt print beween 1895 and 1912, contemporaneous with the newly-perfected platinotype process and its perfectly matte 'engraving-like' surface, which was challenging—as one detractor put it—the "sharp and slimy" albumen print.

MIKE WARE

See also: Light-Sensitive Chemicals; Albumen Print, Dry Plate Negatives: Gelatine; Dry Plate Negatives: Non-Gelatine, Including Dry Collodion; Photogenic Drawing Negative; Talbot, William Henry Fox; Blanquart-Evrard, Louis-Désiré; Toning; Daguerreotype; Le Gray, Gustave; Sutton, Thomas; Photographic Exchange Club and Photographic Society Club, London; Henneman, Nicolaas; Hill, David Octavius and Robert Adamson; Taylor, Alfred Swain; Calotype and Talbotype; Wet Collodion Negative; and Wet Collodion Positive Processes.

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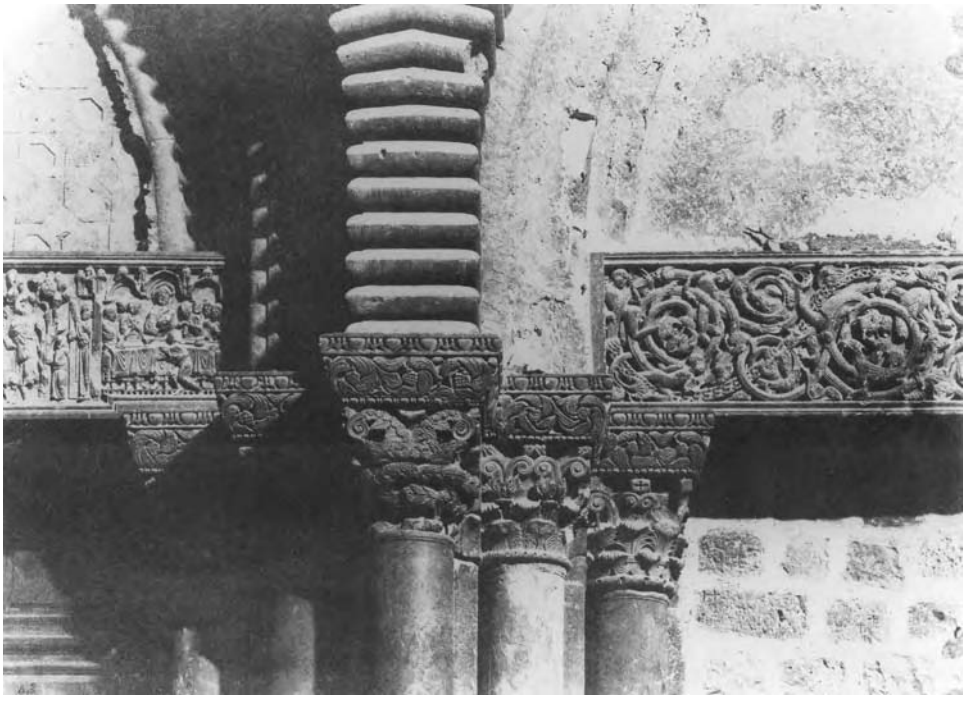
SALZMANN, AUGUSTE (1824–1872)

Archaeologist and painter

Impassioned by the early East, Auguste Salzmann went to Italy (1844) and Algeria (1847) with his friends Gustave-Henri Salzmann (a homonym) and Eugene Fromen-



Salzmann, Auguste. Jerusalem, Saint Sepulcre, Details de Chapiteaux. *The Metropolitan Museum of Art, Gilman Collection, Gift of The Howard Gilman Foundation, 2005 (2005.100.373.86) Image © The Metropolitan Museum of Art.*

tin. The company Schoengauer de Colmar provided the financial assistance for them stay in Egypt at the time of the excavations of Mariette (1851). This environment stimulated Salzmann's learning for archaeology, so he documented the architecture by means of photography. At the end of 1853, he left for the Holy Land to photograph the monuments studied by archaeologists two years earlier. In June 1854, he brought approximately 150 negatives from Jerusalem although his partner Durheim remained there after his departure, and produced around fifty more, which he published in 1856 in the form of album that he dedicated to Saulcy.

The *Jérusalem, époques judaïque, romaine, chrétienne, arabe; explorations photographiques* contains 174 prints obtained using paper negatives and 92 pages of text (Museum of Orsay: donation Robien de Bry; BNF; private collection). This work, printed by Blanquart-Evrard and published by Gide and Baudry, constitutes a luxurious album published in the early years of photography. The print quality gave the images relief and a particular intensity.

At the end of 1857, Salzmann left for Rhodes where he remained for several years, in particular to excavate the necropolis of Camiros (1858–1865). In 1863, he set out again for the Holy Land with Saulcy to undertake more thorough research. He brought back from this second campaign a set of salted paper prints on (approximately 26 × 32 cm) which were then reproduced in the form of photolithographies, in the workshops of Joseph Lemercier. These images were intended to illustrate the articles of Félicien Caignart de Saulcy.

These two voyages made Salzmann an occasional photographer who seized the appropriateness of the new medium to serve his scientific goal. He fully explored the malleable possibilities of photography just as well as other photographic professionals. Salzmann took part in the very first exposition organized by the Société française de photographie in 1855, with a panoramic view of Jerusalem, which was noted for the skill of execution (however, he was never a member of the SFP).

The views of the first voyage were among the most beautiful images of Jerusalem, and of a very poetic range, in spite of the scientific approach that inspired them. Salzmann studied ruins according to a rigorous approach, similar to that of Henri le Secq for Mission Héliographique. Le Secq's countryside images of Alsace was perhaps what inspired Salzmann to photograph the general and in contrast, the individual as well, creating overall sweeping images of the Valley of Josaphat, juxtaposed to images of enclosing walls, and drains. Salzmann photographed whole monuments as well often finding focus in the details. The project emphasized the closer details (apparatuses, ornaments) and points of view, namely all that the traditional artist did not have time to draw. The strongest images were indeed those which favored the large layout, which were unusual at that time.

In the foreword of the album, Salzmann wrote: "the photographs are not any more of the accounts, but of many gifted facts of a brutal conclusiveness." From this point of view, the Jerusalem album offers a successful application of the paper negative to the challenge of illustrating archaeological remains. Salzmann's images were used as a way to report and testify to the reality of the archaeological vestiges. In that, these views fulfilled the goal of photography assigned by Arago, which was to reproduce testimonies of the history of humanity. However these images go well beyond mere representation, glorifying the stones and the architectural and sculptural reliefs in a controlled play of light and shade. By their character of immediacy, the images acquired a great effectiveness. With the effects of the subject matter, Salzmann perceived with acuity the possibilities of the photographic medium. The power of certain images is accentuated by the fact that the town of Jerusalem was in ruins, and therefore uninhabited.

With the photographs of 1854, Salzmann takes his place in the role call of eminent travelers in the east, consisting of painters and draughtsmen, then photographers. From 1840, Egypt in particular and then other regions were regularly visited by the followers of the new medium. In the known body of photographs taken in the East between 1840 and 1855, Salzmann occupies quite a particular place, which one could consider a personal esthetic. Surpassing simple representation, his work offered a fresh vision in the field of archaeological photography.

HELENE BOCARD

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SAMBOURNE, EDWARD LINLEY (1844–1910)

Edward Linley Sambourne was one of the most eminent British cartoonists and illustrators of the late nineteenth century. For over forty years, from 1867 onwards, his work appeared in nearly every issue of *Punch* magazine, where he succeeded Sir John Tenniel as chief cartoonist in 1901. A gifted and skilful draughtsman, some of

his best work appeared as book illustrations, such as his drawings for Charles Kingsley's *The Water Babies* (1885). Sambourne was also an enthusiastic and prolific photographer, relying heavily on photographs to support his draughtsmanship and building up a reference collection of around 30,000 images.

Sambourne first took up photography in the early 1880s, attracted like many others by the increased ease and convenience offered by the recently introduced gelatin dry plates. However, unlike the vast majority of these new amateur photographers, Sambourne's motivation for becoming a photographer was primarily pragmatic and utilitarian rather than recreational. Over the years, Sambourne had amassed a huge collection of commercial photographs and magazine cuttings to use as visual references for his drawings. However, the tight deadlines he had to work to meant that it was often impossible for him to find commercially produced images which exactly matched his needs. Photography provided Sambourne with the perfect means of obtaining precisely the image he required, exactly when he needed it. Many artists, of course, have made extensive use of photographs, but most were reluctant to admit the debt that they owed to photography. Sambourne, to his credit, was refreshingly candid and open about his working methods. In two interviews he gave in 1893 he explained: 'I do not agree with those artists who codemn the aid of photography altogether. On the contrary, I consider it a very useful and valuable adjunct to art.' and, more revealingly, 'You see, I don't believe in drawing out of my head, as people call it. I go to Nature herself, and that must be better art than working from mere recollection—at least, that is my opinion. I'm always on the look-out for people, objects and scenery to photograph...' Soon, rather than being merely a 'valuable adjunct,' photography became an indispensable tool which came to dominate his working practice. Indeed, a fellow *Punch* cartoonist, Harry Furniss, later described Sambourne as 'a slave of the camera and mere copyist'—a charge which Sambourne fiercely refuted. Even a superficial study of Sambourne's photographs and cartoons, however, reveals just how dependent on photography he became.

At his home in Stafford Terrace, Kensington, London, Sambourne photographed himself, members of his family, friends and servants in poses and attitudes reflecting the requirements of his weekly cartoon for *Punch*. He also made frequent use of a huge variety of props and costumes. The resulting negatives were processed by Sambourne in his home darkroom which he converted from a bathroom and contact printed to produce cyanotypes or platinum prints. These prints were then traced to form the outline of the cartoon. Indeed, many of Sambourne's drawings are direct transcriptions of his photographs down to the smallest detail.

In 1893 Sambourne joined the Camera Club—a sign of his growing interest in photography that now transcended his work-related activities. The Camera Club had recently moved to new well-appointed premises on Charing Cross Road and Sambourne made full use of the facilities offered, attending meetings and lectures and using the darkrooms and studio. Many of his photographs taken at the Camera Club reflect Sambourne's main area of photographic interest—the female nude. Whilst some of these studies were genuine *aides-memoire* for his drawings, the sheer volume of nude photographs, combined with the nature of the poses implies that their motivation was primarily private rather than professional. They can be viewed as both artistic and erotic with many transcending the boundary into the fetishistic and mildly pornographic. For his nude photography Sambourne used professional models and usually worked at the Camera Club. On rare occasions, however, he would invite the models into his home—making sure that his wife was safely out of the way, staying at the family house in Ramsgate.

In 1905 the Camera Club closed temporarily. This coincided with a change in direction for Sambourne's photography. Whilst continuing to photograph nudes as well as the tableaux which formed the basis of his work for *Punch,* he now began to devote time to exploring the possibilities of the snapshot. He had bought his first hand camera in 1892 and relished its potential for 'candid' photography. Sambourne's favourite subjects were schoolgirls that he photographed in the streets of Kensington, using a detective camera disguised as a pair of binoculars that took a photograph at right angles to the direction in which it appeared to be pointed. Despite the unpleasant connotations clearly implicit in these photographs, there is no denying their freshness, vitality and spontaneity and they represent some of his most interesting work.

It is, perhaps, significant that this, the last expression of Sambourne's continuing and at times all-consuming enthusiasm for photography, should also embody an element of subterfuge and secrecy. In his photography, as with so many aspects of his personal life, Sambourne seemed able to keep the various strands of his public and private persona detached and separate. He remained a public figure with very private passions—a man of contrasts and contradictions, a man who despite the huge amount of time and energy he devoted to it, could still reply, when asked if he was fond of photography: 'No, I can't honestly say that I am.'

Sambourne died in 1910. His house is Stafford Terrace is preserved and is open to the public as a unique

example of a late Victorian townhouse. The family archive, including Sambourne's photographs, is held at Kensington Central Library.

COLIN HARDING

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SANDERSON, FREDERICK H. (1856–1929)

English photographer and inventor

Frederick Sanderson was born in July 1856 to a long established Cambridge family. He started work as a cabinet maker and as a wood and stone carver and became interested in photography in the 1880s. He took a leading role in his local photographic society. Photographic retailing was added to his cabinet making business.

Sanderson had a particular interest in architectural photography and, unable to find a camera to meet his needs, he set about designing one. The outcome of his work was the subject of British patent number 613 of 10 January 1895. The patent described a method of supporting the front or back of a camera which allowed them to be fixed at any angle. In practice the design was incorporated into a double strut on each side of the front standard which could be locked into any position. The patent also referred to a rotating lens panel into which the lens was mounted eccentrically and bellows which tapered on their lower side to aid the extreme movement available with the strut arrangement.

Sanderson licensed the design to George Houghton and Son of London who initially had the camera made for them by Holmes Brothers. Holmes Brothers were incorporated into Houghtons Ltd in 1904 and the camera was subsequently made and sold by them or their selling company Ensign Ltd until its demise in 1940. The camera was popular and the original field camera model, made in a variety of plate sizes. A hand and stand model was offered from 1899. The hand camera underwent a process of continual improvement with further patents from Sanderson and others. It was last listed in Ensign's 1938 catalogue by which time upwards of 26,000 examples of the sixty distinct models of Sandersons had been made.

Frederick Sanderson does not appear to have made any further significant contribution to photography. He died on 9 July 1929 leaving an estate valued at £1887 12s 3d.

MICHAEL PRITCHARD

SARONY, NAPOLEON (1821–1896) AND OLIVER FRANÇOIS XAVIER (1820–1879)

The Canadian brothers, Napoleon and Olivier Sarony, earned their respective reputations on opposite sides of the Atlantic—Napoleon becoming New York's pre-eminent 19th century theatre photographer while his older brother operated the most successful portrait studio in the north-east of England.

The sons of an officer in the Austrian army who had moved to Canada after Waterloo, the brothers moved to New York with their parents in 1831, and by 1841, both had become enthused by photography, with Oliver operating daguerreotype studios briefly in both New York and Quebec. Napoleon, however, initially trained as a lithographer and worked for a time with the eminent American print-maker Nathaniel Currier before setting up his own lithographic business in partnership with James Major in 1843. By 1857 the company had acquired another partner and traded as Sarony, Major & Knapp. Despite his later success with photography, he retained a profound interest in lithography.

In 1843, the year Napoleon established Sarony & Major, Oliver had emigrated to England, and spent several years as an itinerant daguerreotypist in eastern England. Early advertisements list him in the 1840s and early 1850s operating studios in towns and cities in Yorkshire, Nottinghamshire, and Lincolnshire. Given the attempts by Richard Beard to retain tight control over the use of the daguerreotype in England in the 1840s through his patents and licences, it can be assumed that Oliver was using the process unofficially.

By 1854, he was operating a mobile studio throughout Cambridgeshire and Norfolk, eventually opening a permanent studio in Scarborough, Yorkshire, in 1857. This represented a complete change of direction for Oliver, as itinerant photographers were usually at the lower end of the market, while advertisements for the Scarborough studio emphasised the quality of his work, and were priced accordingly. Before the end of that year he briefly opened another studio in Newcastle, and returned to Scarborough in July 1858 to open Gainsborough House, a custom-designed studio built to his own specification at South Cliff, and he remained at that address until his death in 1879. Many of the studio's cartes-de-visite bore the address 'Sarony Square, Scarborough.'

Oliver Sarony was not only a fine photographer, he was an innovator as well, with a keen business eye. Several of his innovative ideas were patented—with two

Sarony, Napoleon. Oscar Wilde.
The Metropolitan Museum of Art, Gilman Collection, Purchase, Ann Tenenbaum and Thomas H. Lee Gift, 2005 (2005.100.120) Image © The Metropolitan Museum of Art.

patents (1858 No. 725, and 1858 No. 1501) covering aspects of studio practice and the coloring of prints, and another in 1862 for an improved combined posing chair and head restraint.

He employed painters and colourists to produce large portraits from his photographs, and opened and developed an art gallery selling paintings, lithographs, and his own photographs of royalty and celebrities. His fame drew a visit by the Prince of Wales in 1869, resulting in a sitting which further extended Sarony's.

In his obituary (*Anthony's Photographic Bulletin*, September 1879, 287) his Scarborough operation was described, at its height, as having 98 rooms and employing 110 staff.

By the late 1860s, Sarony & Co. was offering for sale a range of studio backdrops—reportedly painted by his brother Napoleon who had, by that time, opened a photographic studio in New York.

By 1864 he had been joined in England by Napoleon, whose Birmingham studio, Sarony & Co., operated from premises in New Street from 1864 until after 1880. The *British Journal of Photography* in its issue of April 28 1865, 222, reported Napoleon's patent 'Improvements in the Production and Treatment of Photographs.' A few weeks earlier, the *American Journal of Photography and the Allied Arts & Sciences*, Feb. 1 1865, 351–352, had commented on Napoleon's new techniques for vignetting being used in the Birmingham Studio, and in May 1866, The *Art Journal* reported that he "is one of the best photographers [working] in Birmingham" and that he "uses the 'rest' invented by his brother, of Scarborough."

But the Birmingham venture was not his first. Napoleon Sarony's first studio is believed to have opened in Yonkers in 1857, where he was listed as a daguerreotypist, at which time he was still involved with the lithographic business of Sarony Major & Knapp. The fact that Knapp joined the partnership at that time may have been as a result of Napoleon's decision to change professions. The studio is not listed after 1858, and he is believed to have left for a tour of European lithographic companies some time before 1860, arriving in England in 1863. With the Birmingham studio established, however, he returned to America, and his New York in Union Square studio opened in 1866 or 1867. Over the following thirty years he is reputed to have photographed every major star on the New York stage.

Napoleon was a major influence in the emerging use of publicity photographs in the theatre. In addition he photographed many writers and celebrities. By the time of his death in 1896, the studio is believed to have amassed an archive of over forty thousand negatives.

Napoleon was at the centre of a celebrated court case in 1883, over the unauthorized duplication and publication of one of his portraits of Oscar Wilde. The case of *The Burrow-Giles Lithographic Company against Napoleon Sarony* was heard first in a District Court, and subsequently argued in the US Supreme Court in December 1883. It centered on whether or not the copyright protection granted to photographers under the US Copyright Act of July 1870 was constitutional. The question related to whether or not the photograph existed separately from the person it portrayed—and as Oscar Wilde's physical appearance was not copyright, nor could be a photograph of him. In 1884 the Supreme Court found in favor of Sarony, but conceded that all photographs might not necessarily be thus protected. Central to this definition of copyright was the ideal that the photograph should be *"entirely from his own mental conception"* and that the photographer must be responsible for *"arranging the subject so as to present graceful outlines, arranging and disposing the light and shade,* [and] *suggesting and evoking the desired expression."* Thus, this ruling constitutionally defined a

photograph was being the work of an author, as original as the written word—a major milestone in copyright protection.

The character of Julius Bianchi in the 1902 novel *The Fortunes of Oliver Horne* is believed to have been based on Napoleon Sarony.

JOHN HANNAVY

See also: Daguerreotype; Cartes-de-Visite; and *British Journal of Photography.*

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SAUNDERS, WILLIAM THOMAS (1832–1892)

English photographer

William Saunders, one of the finest nineteenth-century photographers of China and Japan, operated a studio in Shanghai from around 1861 until at least 1887. Like Felice Beato in Japan, Saunders' success was built upon the production of souvenir albums of Chinese scenery and *genre* studies for foreign residents and visitors. Much of this work has survived and his talent is self-evident. His Chinese landscape portfolio of Shanghai, Ningpo and Foochow was supplemented by views of Peking and Japan. He made his first photographic tour to Japan in 1862, accumulating some 90 images but, surprisingly, only a few of these have so far been identified and are in the Worswick Collection, Tokyo. In May, 1863 Saunders offered handcolored photographs and may well have been the first commercial studio in the Far East to do so. Apart from his larger-format work, which also included multi-plate panoramas of Chinese and Japanese towns and cities, Saunders also sold *cartes de visite* and stereoviews.

Having enjoyed considerable commercial success, he sold all of his stock and equipment in 1871 and returned to England to marry. Perhaps his marriage failed because, by the following year, he was back operating his studio in Shanghai. His wife died in England in 1887 and shortly afterwards he decided to retire and went home. Returning to Shanghai on a visit in 1892, he caught bronchitis and died.

TERRY BENNETT

SAUVAIRE, HENRI (1831–1896)

French photographer

Henri Sauvaire was born in Marseille. Raised by his Uncle Marius, a merchant who often dealt with the Near East, he soon became familiar with Orient. As Henri de Clercq (1836–1901) or Gustave de Beaucorps (1825–1906) he was among those talented amateur photographers fond of Orient. He certainly learned photography in France in the mid-fifties and practiced it during thirty years along with a successful diplomatic carrier started in 1857 in Lebanon, as a *drogman* in Beyruth, and ended in 1885 in Morocco as the French consul. He then came back to France, near Marseille, where he died.

Unfortunately only some of his photographs are still kept today (the Musée d'Orsay received in 1995 from René and Bernard Sauvaire a very important gift of 160 prints, both from paper and glass negatives). Most of the remaining prints have been taken between 1860 and 1866 in Lebanon, Syria and around the Bosphorus. Henri Sauvaire was a fine observer of oriental life and landscapes. He revealed his sense for artistic composition as well as his technical abilities in large Beirut panoramas, sad views of the Christian quarter in Damas burnt down after the civil war in 1860 as well as in beautiful prints of the famous Damas Omayad mosque.

Familiar with occidental circles in Lebanon he also did several photographs of Camille Rogier (1805–1870) studio. Painter and illustrator—he has illustrated the first French edition of Hoffmann's tales; Rogier was close friend to Théophile Gautier, Gérard de Nerval and Gustave Flaubert. Even if he almost left his artistic carrier for a more lucrative position in postal administration, Rogier stands in front of Sauvaire's camera as a painter, before a white canvas, surrounded by friends. The *tableaux vivants* Sauvaire composed in the eccentric French man studio show the photographer sense of humor as well as his mastery of lightening. His soft portraits of women whose beauty is enhanced by the sumptuous fabrics of their Turkish clothes underline Sauvaire's delicacy.

In 1866, Sauvaire traveled with Christian Edouard Mauss around the Dead See thanks to an archeological expedition supported by the Duc de Luynes. He took there almost one hundred prints to be published by Melchior de Vogüé in 1875. The views of the ruined crusaders castles gave him first rank, along with Auguste Salzmann (1824–1872), as masters of early archeological photography. Fine scholar, experienced numismatist, Sauvaire then published and translated several books on Oriental civilization.

DOMINIQUE DE FONT-RÉAULX

SAVAGE, CHARLES ROSCOE (1832–1909)
American photographer

Charles Roscoe Savage's beginnings were modest. He grew up in a poor Southampton neighborhood and as the son of a gardener received very little schooling and was expected to contribute to the family finances at an early age. He did, however, have an interest in religion and in 1848, despite his family's objections, he converted to the Church of Jesus Christ of Latter-Day Saints (the Mormons). In 1855 Savage left England for New York City. Although he was interested in photography while still in England, only when he reached New York did he begin his study in earnest. He found the trade to be very secretive and had difficulty in receiving training of any kind. Eventually, through reading, experimentation, and paid lessons he became quite competent.

In 1860 he arrived in Council Bluffs, Iowa (then the main departure point for the Overland and Oregon Trails) where he set up a crude darkroom and gallery. He was able to earn enough money to buy and outfit a wagon for his small family for the trip westward. On August 28, 1860, Savage finally reached the Mormon Zion in Utah. At first his business was almost exclusively devoted to portraiture, but Savage soon went outdoors by photographing the buildings of Salt Lake City as well as the mountains and small towns of Utah. After several years, though, Savage felt more and more isolated from other progressive photographers and from the latest developments in the art. In 1866 he came up with a daring plan to travel 9,000 miles from Salt Lake City to San Francisco to New York and then back to Utah that would plunge him deeply in debt, but which began his rise to national prominence as a Western photographer.

Savage left Salt Lake City for San Francisco, California by stagecoach. He visited with a number of photographers while in the city including Carleton Watkins. He then took a steamer down to Panama, crossed the Isthmus and took another boat north to New York City. In New York he bought photographic supplies from the E. and H.T. Anthony Co. and visited with several publishers before traveling to Philadelphia to pick up a wagon similar to the darkroom wagons used by Civil War photographers. He shipped the wagon by boat and rail to Nebraska City, Nebraska. He then traveled across the Plains, into the Rocky Mountains, and back to Salt Lake City (of course photographing the more famous places on the Oregon Trail as he went). Savage made a number of contacts on this voyage and soon after his images started showing up as lithographs in *Harper's Weekly* and *Leslie's Illustrated* and were marketed on the East Coast through the New York firm of Fowler and Wells. Savage also subsequently published articles in *The Philadelphia Photographer* and *Humphrey's Journal of Photography and the Allied Arts and Sciences*.

In 1869 when the Union Pacific and Central Pacific Railroads were scheduled to come together at Promontory, Utah, Savage was asked to join Andrew Joseph Russell and Alfred Hart to photograph the final drama of "The Work of the Age." This event opened doors among the railroad companies and for the next 30 years Savage enjoyed free passes and sometimes even private luxury cars on several lines. Savage's photographs encouraged tourism for the railroads while providing him the means to travel about the West photographing the landscape and its diverse peoples. Savage also benefitted from interest in the Mormons of Utah. Americans had a morbid curiosity about polygamy (Savage himself would eventually marry four women), with the worship of a living prophet, and with the Mormon theocratic government. After the railroad was completed, greater number of tourists visited Salt Lake City and a stop at Savage's studio became almost mandatory.

In 1869 Savage also met (presumably for the first time) two of the best known photographers of the American West, William Henry Jackson and Timothy O'Sullivan. Although at the time they could not know it, these three would introduce the country to the scenic Western landscape long before Buffalo Bill peddled the mythic West of cowboys and Indians. Whereas O'Sullivan and Jackson would travel to the most remote areas of the West, Savage stuck to the more traveled byways, using wagons and trains rather than mules and makeshift boats. And although Savage had an appreciation for wilderness, he did not embrace it as did O'Sullivan and Jackson whose photographs celebrate the breathtaking landscape and majestic scale of the West. In comparison with these two, Savage's photographs focus on development. Upon first seeing what would later become Zion National Park Savage wrote, "From a picturesque point of view, it was grand, sublime, and majestic, but as a place of residence, lonely and unattractive, reminding one of living in a stone box; the landscape, a skyscrape; a good place to visit, and a nice place to leave" (Richards, 66).

In part due to this ambivalence towards nature, Savage's images have never received the critical attention of Jackson and O'Sullivan. Certainly he is not put in the same category as Carleton Watkins or Edweard Muybridge whose subtle experiments with unconventional views and composition are lacking in Savage's work. He did, however, document an important sub-culture (the Mormons) and his relentless travels around the West ensured that he would be remembered among the major names of nineteenth-century Western photographers.

Savage was also a savvy businessman, one who did not succumb to the bleak financial fate of so many other Western photographers. He was successful in part because his photographic studio was also a general art store that sold various photographic and artistic supplies, periodicals, books, craft goods, and miscellaneous novelties. He had a variety of contacts on the West and East coasts through which he could market his photographs and stereo-views and who would, in turn, provide him with merchandise to sell at his "Art Bazar." Despite a few setbacks (his gallery burned down in 1883) his business continued to grow over the years. As amateur photography grew increasingly popular in the 1880s and 1890s, Savage moved into photo finishing and camera sales. After the turn of the century, Savage devoted more and more of his time to various philanthropic events and to the Mormon Tabernacle Choir. In fact, when he died of a heart attack on February 3, 1909, he was almost as well known for his generosity as for his photography.

DANIEL DAVIS

See also: Watkins, Alfred; and O'Sullivan, Timothy Henry.

Biography

Charles Roscoe Savage was born on August 16, 1832. He grew up in a poor Southampton neighborhood but moved to New York City in 1855. Savage began his study of photography in New York and opened his first gallery in Salt Lake City, Utah in 1860. He started with portraiture, but quickly branched out to photograph buildings, towns, mines, newsworthy events, and landscapes in Utah. In 1866 a trip to New York and Philadelphia brought attention to the young photographer, but it was not until he attended the joining of the Union Pacific and the Central Pacific Railroads at Promontory Point in 1869 that Savage became a recognized name. After 1869 he would travel throughout the West (with free passes from the railroads) shooting scenes of interest along the lines. In comparison with his peers such as Carleton Watkins, Timothy O'Sullivan, and William Henry Jackson, Savage was not as ambitious about seeking out new photographic opportunities, nor did not embrace the western landscape as they did. He did, however, document an important sub-culture (the Mormons) and he was one of the first photographers to provide images of the American West to eager Eastern audiences. Savage was also a savvy businessman whose profits from a successful art store in Salt Lake City allowed him to continue his photographic career. Unfortunately, only a few original Savage negatives exist today because of two devastating fires in 1883 and 1911.

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SAVILLE-KENT, WILLIAM (1845–1908)

English naturalist and photographer

Saville-Kent (also known as Kent) was born in Sidmouth in Devon, England, on 10 July 1845 to Samuel Savill Kent and Mary Ann Kent. After studying at King's College, and the Royal College of Science under T.H. Huxley, he initially pursued a career in natural history museums, including the British Museum. In 1873, he accepted the position of resident naturalist at the recently opened Brighton Aquarium. Similar roles followed at other public aquaria until he was appointed Superintendent of Fisheries in Tasmania, Australia, in 1884. Saville-Kent's research into marine life and its commercial applications, including pioneering work in pearl culture, earned him a number of advisory roles for the Victorian, Queensland and Western Australian colonial governments from 1887. These provided him with opportunities to travel to some of the farthest regions of the continent and adjacent islands. During this time he took up photography and produced remarkable coral reef views and studies of natural history specimens. Saville-Kent published numerous scientific studies throughout his career, however he is best known for two, more popular, natural history monographs from that latter period in Australia—*The Great Barrier Reef of Australia*, 1893, and *The Naturalist in Australia*, 1897—both extensively illustrated with his photographs. He developed various techniques for photographing natural history subjects and experimented with colour processes, exhibiting his photographs at the Royal Society in 1891 and the Royal Photographic Society (RPS) in 1906. The latter, shown by invitation of the RPS Council, included over eighty natural colour transparencies prepared by the Sanger-Shepherd trichromatic process with modifications, and were presented as lantern-size plates, half and quarter-size plates and stereos. Following a sudden illness and bowel surgery, Saville-Kent died in Bournemouth, England, in 1908.

KATE DAVIDSON

SAWYER, JOHN ROBERT MATHER (1828–1829) AND CHARLES (1861–1914)

English photographers

John Sawyer was born in Sheffield, but started his career as an optician in Norwich. He opened a studio on Regent Street, London in 1871 with Walter Strickland Bird (1828–1912), later admitting Edward William Foxlee (1832–1913) to the partnership. At the same time, the partners took an interest in the recently established Autotype Company, operating out of Ealing.

In January 1873 John Spencer (manager of the chemical department), and Bird bought out the Company together with its London Gallery at 36 Rathbone Place, St. Marylebone. A modification by Sawyer of the carbon process was patented in 1874, as "flexible temporary suppor,t" paper coated with gelatine rendered insoluble by means of chrome alum, followed by a second coat in soda and borax. Sawyer's son Charles joined the Company shortly before his father's ill health forced a premature retirement. John Sawyer died at sea in sight of Naples harbour January 21 1889, while on a health cruise.

Charles was sole manager of the Autotype Company after Bird's mental health deteriorated, forcing him to retire in 1900. Sawyer, whose main interest had always been with the technical manufacture of the carbon printing, himself died prematurely after a long illness September 22, 1914.

David Webb

SAWYER, LYDDELL (1856–c. 1908)

English photographer

When the photographer Lyddell Sawyer joined the Brotherhood of the Linked Ring in November 1895, he took the pseudonym of 'Sheriff.' Despite having been one of the original 'secessionists' from the Photographic Society of Great Britain (today the Royal Photographic Society) in 1891, the association which became known as the Linked Ring was three years old before he formally became a 'link.'

Originally from the north east of England—he is believed to have been born in Sunderland, and to have worked in a professional studio in Newcastle before establishing his own studio in the town in 1885—'Lyd' Sawyer had quickly earned for himself the reputation as one of the finest 'art photographers' in late Victorian England, and was a friend of such other eminent practitioners as Frank Meadow Sutcliffe and Henry Peach Robinson. From 1896 he operated a portrait studio in Regent Street, London.

Given the importance of his contribution to the development of photography as an art, surprisingly little is known of his life and work. A staunch advocate of the idea that a photographer should 'make' rather than 'take' pictures, his images have a lyrical narrative quality.

His images appeared in several influential publications, including *Sun Artists* (vol. 4), 1890, and *Photographs of the Year,* the published catalogue of the Photographic Society's 1891 exhibition, with a text by H P Robinson.

He left the Linked Ring in 1901, and continued to operate a studio in Maida Vale until at least 1908.

John Hannavy

SAXTON, JOSEPH (1799–1873)

American Photographer

Joseph Saxton is credited with creating the oldest extant American-made photographic image. Taken from his window at the Philadelphia mint where he served as curator of weights and measures, the daguerreotype captured the cupola of Central High School and a portion of the State Armory building on a silver plate used to cut coin blanks. The actual date of the image has been disputed as several accounts of the Daguerre's process were available in the United States in September and October of 1839. The earliest published reference to Saxton's daguerreotype is a description that appeared in the *United States Gazette* on October 24, 1839. Best known as a talented machinist, instrument maker and inventor, Saxton constructed and improved upon a wide variety of scientific and practical devices. He was a member of the American Philosophical Society, the Franklin Institute, and the National Academy of Sciences. Born in Huntington, Pennsylvania on March 22, 1799, Saxton spent his early career in Philadelphia employed as a clock and watchmaker. He lived in London for nearly a decade where he was affiliated with the Adelaide Gallery of Practical Science before returning to Philadelphia in 1837 to accept the position at the mint. He served as chief mechanic in the Office of Weights and Measures of the U.S. Coast Survey from 1843 until his death on October 26, 1873 in Washington, D.C.

Jenny Ambrose

SAYCE, B. J. (1837–1895)

The name of B.J Sayce first came to national prominence within the photographic community with the publication of the paper 'Photography Without a Silver Nitrate Bath' in *The British Journal of Photography* on September 9th 1864. That article effectively marked the end of the wet collodion era and prefaced the dawn of modern photographic materials.

Although his name usually follows that of William Blanchard Bolton in histories of photography—'Bolton and Sayce' being given joint credit—Bolton himself acknowledged that it was Sayce's understanding of chemistry which drove the development of photography's first true emulsion.

Sayce's quest for an emulsion which could simply be poured on to a plate and then exposed clearly places the genesis of the idea in the wet collodion era. From initial experiments in 1859, it took five years of development before the announcement of a working collodio-bromide emulsion in 1864.

The emulsification of silver bromide in collodion removed the need for the separate silver nitrate bath, and was the forerunner of all the dry plate emulsion technology which followed. For several years, Sayce's discovery was known as the Liverpool Process.

Always an amateur photographer, Sayce was a founder member of the Liverpool Amateur Photographic Association, and one of the instigators of the first International Photographic Exhibition held in Liverpool in 1888.

JOHN HANNAVY

SCHAEFER, ADOLPH (c. 1820–1853)

Dutch photographer

Started original as a painter and according an advertisement in the Journal of The Hague in the Netherlands he worked there as a photographer from January 1st until the 14, 1843. He was befriended with Philipp Franz von Siebel who wrote at Leiden on May 1, 1843, a letter of recommendation to King William II of the Netherlands to ask the King if Schaefer could work in the Indonesia to work for the Ministry of Colonies to photograph the historical buildings and places for the government. In 1844 he traveled to Indonesia to replace Jurriaan Munnick, as the Dutch Government was not pleased with the results of Munnick's work.

Before he left he bought on November 3, 1843, photographic equipment from Hottinguer & Comp. in Paris for for 8882 Dutch guilders.

After his arrival Schaefer made more then 5000 pictures of many Indonesian monuments and geological places in the West Indies in order of the Dutch Government. He used daguerreotype and later albumin types. Most of his work in preserved at the Tropical Institute of Amsterdam, some is preserved in the collection of art at the Rijksmuseum in Amsterdam. In 1849 Schaefer opened a studio in Semarang on the Isle of Java and also gave lessons in photography.

After this time Schaefer disappeared. It could be the result of his debt of 6073,53 guilders to the Dutch Government.

In Dresden a men named Schaefer died in 1853, leaving behind a widow and a son.

PETRA NOTENBOOM

SCHEELE, CARL WILHELM (1742–1786)

Swiss chemist

The chemist Carl Wilhelm Scheele was born in Stralsund, then part of Sweden, now Germany, and was one of a number of eminent scientists whose work predicted and laid the foundations for photography. His research in 1777 into the blackening effect of light on silver salts confirmed the earlier findings of Johann Heinrich Schultze, and progressed scientific understanding of what would become photographic chemistry.

Scheele's significant discovery was that the blackening effect of light on silver chloride—he had isolated and identified the element chlorine in 1774—was due to chemical reduction, and that the result of that reduction was black silver metal. His recognition that silver chloride blackened more quickly when exposed to light at the blue and violet end of the spectrum was a significant contribution toward understanding that spectral sensitivity.

In so doing, he coined the expression 'chemical rays' to denote those wavelengths of light which has actinic properties.

That ammonia dissolved silver chloride was already known to chemists, but Scheele's application of that knowledge to remove the silver chloride which had not been affected by exposure to light predicted the 'fixing' process upon which permanent photography would later depend.

He is credited with the identification of citric, malic, oxalic and gallic acids—the last also a key chemical in early photography—and was the first to recognise that air is predominantly made up of two gases, oxygen and nitrogen.

JOHN HANNAVY

SCHLAGINTWEIT, HERMANN (1826–1882); ADOLPH (1829–1857) AND ROBERT (1833–1885)

German explorers and scholars

The five Schlagintweit brothers—Hermann, Adolph, Eduard (1831–1866), wrote an account of the Spanish expedition to Morocco in 1859–60, Robert and Emil (1835–1904), and specialized in Tibetan studies—also worked in Europe and Asia. Hermann's first scientific mission, in association with his brother Adolph, was conducted in the Alps between 1846 and 1848. Subse-

quent expeditions in the same region, in which Robert took part, confirmed their reputation as scientific explorers. In 1854, the East India Company commissioned the three brothers to pursue a magnetic survey of India on the death of surveyor Charles Elliot. During 1854–57, they traveled throughout the Deccan and the Himalayas, and at some occasions, beyond the frontiers of the Company's territories. Hermann and Robert were the first Europeans to cross the Kunlun Mountains in China, for which Hermann received the title *Sakünlünski*. During these travels, Robert took a number of ethnographical and topographical photographs. Upon their return in Europe in 1857, the two brothers published *Results of a Scientific Mission to India and High Asia* (4 volumes, 1860–66). Adolph pursued his research in Central Asia and was put to death by the Amir of Kashgar on 26 August 1857. Hermann settled in Jägesburg and devoted himself to writing. Robert was appointed professor of geography at Giessen in 1863 and traveled widely to America between 1867 and 1870, where he lectured and traveled along the Pacific coast, publishing his research between 1870 and 1876.

STEPHANIE ROY

SCHNAUSS, JULIUS KARL (1827–1895)

German photographer, photo-chemist, and photographic writer

Julius Karl Schnauss was born in Weimar on 7 July 1827 to the court advocate Carl August Constantin Schnauss. Being deaf since his childhood he primarily received a private education. From 1847 to 1849 Schnauss studied physics and chemistry at the University of Jena but experimented mainly in his own laboratory. After gaining his doctorate in chemistry, Schnauss began photographing, opening a portrait studio in Jena in 1852. In the same city, he founded one of the first photographic schools in Germany, the *Photographisch-Chemische Institut* in 1855 where he taught photo-chemistry and practical photography and also sold photographic equipment. Schnauss also tried to establish photography as a discipline at the local university, but without success. In 1858 he was co-founder of the Allgemeiner Deutscher Photographen-Verein [General German Photographers' Association]; in conjunction with this initiative he became editor of the professional journal *Photographisches Archiv* [*Photographic Archive*], together with one of his pupils, Paul Eduard Liesegang. Schnauss closed his school and the studio in the midst 1860s, concentrating on his career as a writer. He published a number of popular manuals and treatises and regularly in photographic and chemical journals. Schnauss also made important contributions to photo-chemistry. He died in Jena on 6 December 1895.

STEFANIE KLAMM

SCHNEIDER, TRUTPERT (1804–1988), HEINRICH (1835–1900), AND WILHELM (1839–1921)

German daguerreotypists

Trutpert Schneider was born 13 March 1804 in Bollschweil (then Bollschweil-Kukucksbad) . Like his namesake, St. Trudpert, the seventh-century Catholic missionary who settled in Baden, he called the scenic and multi-lingual area around Freiburg his home. He was trained to be a cabinet maker by his father Mattäus Schneider, and in 1831, married Regina Locherer and established his workshop in her parents' house in Ehrenstetten. Schneider's fine woodwork and elaborate designs won him an excellent reputation and and a loyal circle of customers including the local landed gentry as well as wealthy residents of the city.

Early in 1847, an itinerate daguerreotypist named Joseph Broglie arrived in Freiburg, having lost his plate holders in transit. He was sent to Trutpert Schneider who fashioned the replacement holders to Broglie's exacting specifications. Broglie, in thanks, made a daguerreotype of the family Schneider: Trutpert, his wife Regina, and three sons, Karl (b. 22 December, 1833), Heinrich (b. 9 October 1835), and Wilhelm (b. 10 October 1839). Trutpert Schneider was instantly captivated by the daguerreotype process and assisted Broglie for a very short time, learning the methods of polishing, fuming, exposing, and developing daguerreotypes. He sketched the dimensions of the camera, the fuming and developing boxes, and all that was necessary to construct his own daguerreotype apparatus. Plying his new trade among his enthusiastic customers, Schneider began his career as a daguerreotypist, offering not only photographs, but boxes adorned with daguerreotypes.

Rather than setting up a studio, Schneider decided to follow the model of an itinerate photographer. Unlike most itinerate photographers, however, Schneider and later his sons Heinrich and Wilhelm travelled from one lucrative city location to another, stopping in the country only to photograph estates and castles, usually by invitation. By 1848, Trutpert and his middle son, the 13 year old Heinrich, had embarked on perhaps their first daguerreotyping tour. It followed a path which they would often take, through Donaueschingen, Heiligenberg and Karlsruhe. Although many of the daguerreotypes made by Schneider and his sons have been dispersed or lost, it is apparent that even in this very early stage, they were much in demand. Trutpert himself and both his sons Heinrich and Wilhelm spoke German, English, Italian, and French, and could accomodate not only tourists, but travel and work easily to the North, South, East, or West.

These small tours continued for several years, during which Trutpert Schneider refined his technique

and began to make stereo daguerreotypes, filling the demand for photographs in three dimensions. It was one of several distinctive characteristics of the Schneiders' photography that they not only made such a large quantity of stereo daguerreotypes, but that they appear to have refused to make any 'studies,' the usual title for nude and often pornographic stereo daguerreotypes. Having begun to daguerreotype at the height of the industry, Trutpert Schneider and his sons adhered to their successful medium, only occasionally making Ambrotypes, and much later, learning the wet plate and dry plate processes. Their lack of novel innovation does not appear to have injured their business or slowed the demand for their photographs.

In 1852, Trutpert and Heinrich Schneider began a much longer tour, on foot, through Switzerland, and over the mountains to the region of Lombardy, which was under Austrian control at the time. It was here that the Schneiders first met the Prince Karl von Baden, whose acquaintence would aid their later work in Russia. The sitting calendar shows that father and son travelled and photographed in Como, Brescia, Verona, Venice and Vicenza. They kept a tight schedule, moving from one place to another, but still there were times when no appointments were made, and to fill the time and his purse, Trutpert offered instruction in his own method of penmanship. In 1854, they were again on the road, this time to Vienna, where they remained a year. This pattern of travel was followed by the brothers Wilhelm and Heinrich when they succeeded their father in the business.

It may have been as late as 1856 that Wilhelm first joined his brother and father in photography. The Atelier of T. Schneider & Sons was firmly established from the year 1858 onwards, when the Schneider brothers kept an orderly record of their portrait sittings. Trutpert, who would live to very advanced age, continued actively in the partnership but more and more remained at home in Ehrenstetten while Wilhelm and Heinrich widened their circles of travel and their fame. They would establish themselves in a city for a certain time, taking rooms that would be made into a temporary and often luxurious studio, and photograph until it was time to move on to the next city. In this way, they daguerreotyped in Cologne, Frankfurt, Bonn, Hamburg and Berlin.

It was in Berlin in 1859, that Wilhelm and Heinrich plied their daguerreotyping skills to great effect, achieving a level of fame that was previously unknown to them. They photographed notables from His Majesty the Prince Regent (preparing and developing the plates in his highness's bedchamber, much to the titillation of the press) to the Lord and Lady Bloomfield. They would return to Berlin several times, documenting not only the wealthy and famous people, but the architecture as well—of which beautiful examples exist in stereo. After their success in Berlin, the Schneider brothers never wanted for work, and indeed they earned enormous sums of money in each city they worked.

In late May 1861, the brothers arrived for their first daguerreotyping tour of Russia. St. Petersburg, still in the grip of winter, was only a short layover before they continued on to Moscow. In Moscow, they were treated like visiting dignitaries, allowed access to the royals, given transportation and an escort, and housed in the Kremlin. On this first visit, the brothers remained less than a month, returning to St. Petersburg, where they stayed a year. They returned to Moscow again in the summer of 1862, and photographed in Königsberg and northern Prussia on their way back to Berlin, returning home finally in 1863.

Although the brothers continued to travel the length and breadth of Germany for several years, they were thinking of settling back near their hometown. They finally opened a newly built photographic studio near the train station in Krozigen in 1867. Trutpert Schneider lived on until 27 December 1899, long enough to see his sons turn first to wet plate, then to dry plate photography. Wilhelm Schneider outlived Heinrich, who died only six months after their father. But when Wilhelm also died in 1921 the era of T. Schneider & Söhne came to an end.

KELLEY WILDER

Biography

Trutpert Schneider (13 March 1804–27 December 1988), and his two sons Heinrich (9 October 1835–13 May 1900), and Wilhelm (10 October 1839–21 January 1921), from near Freiburg in Breisgau, operated a daguerreotype and photographic studio from 1848–1921. For many of these years it was a travelling studio, not only within Germany, but in the neighboring lands of Austria, Italy, and Russia. They refined the art of the itinerate photographer, however, and created an event of their arrival in each city, often photographing the most famous and wealthy inhabitents. From 1859–1863 the firm enjoyed considerable success, spending a great part of the time in Berlin, Moscow and St. Petersburg. Most distinctively, the Schneider Atelier continued to make daguerreotypes and stereo daguerreotypes long after the invention of the wet plate. The daguerreotypes were often hand colored, and the stereos were famous for their plasticity. In 1867 the brothers opened their first fixed studio in Krozigen, incorporating first the wet plate and later dry plate for their photography.

See also: Daguerreotype; and Wet Collodion Positive Processes.

Further Reading

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SCHOTT, FRIEDRICH OTTO (1851–1935)

German glassmaker and chemist

Born in Witten, near Essen, Germany, Schott came from a family of glassmakers. After studying chemistry at Aachen and Wurzburg, he graduated at Leipzig in 1875 with a thesis on 'Defects in the manufacture of Window Glass.' He experimented with new types of glass, using previously unemployed elements such as lithium, boron and phosphorus. In 1879 Schott sent some samples to Ernst Abbe at the Zeiss factory in Jena. Abbe was so impressed that the pair began to collaborate and, in 1882, Schott moved his laboratory to Jena in order to continue his experiments. In 1884, Schott set up the Schott and Genossen glass factory with Abbe, Carl Zeiss and Roderich Zeiss. This glassworks specialised in new forms of optical glass, many of which were previously unknown. Their first catalogue, published in 1886, listed no fewer than forty-four different types of glass. In 1889, along with Abbe, Schott formed the Carl Zeiss Foundation. He succeeded Abbe as the foundation's manager, a post he held until 1927.

Colin Harding

SCHRANK, LUDWIG (1828–1905)

Ludwig Schrank was born on August 24th, 1828 in Vienna. He studied chemistry, physics, mineralogy and geology at the technical university and was in the service of the "K.K. Bergwerksprodukten Verschleiß-Direktion." Until his retirement he remained busy in government service. His interest in electroplating led him to photography. In 1854 he established a studio, in which he worked part time as a portrait photographer. After the doors of his first studio were closed, he established another studio in1868 with Franz Xaver Massak, which was successful from 1870 to 1873. In 1861 Schrank was one of the first establishing fathers of the "Photographische Gesellschaft" Austrias first photographic association. In 1864 he and photographic dealer Oskar Kramer, established the "Photographische Correspondenz." This magazine was appointed the organ of the "Photographische Gesellschaft" a while later. Schrank remained the publisher and editor of the magazine, imtermittendly during the years 1870 to 1885 up to his death. By the mid 1870s, Schrank ended his very active career as a photographer, however, he continuted his publishing and editorial activity for decades. Beside numerous articles in domestic and foreign technical periodicals on topics such as practical and aesthetic topics, he also wrote a practical manual for photographers and a publication discussing copyright in photography. Schrank died on May 20th, 1905, in Vienna.

Astrid Lechner

SCHULTZE, JOHANN HEINRICH (1687–1744)

German chemist

Johann Heinrich Schultze, born in Colbitz, Magdeburg, was a German chemist and polymath, a Professor of Chemistry and Anatomy—and later also Greek and Arabic—at the University of Altdorf near Nuremberg. He was also one of a number of eminent chemists whose work predicted and laid the foundations for photography.

While engaged in chemical experiments in 1725 seeking to produce phosphorus, Schultze discovered that chalk—which by chance also contained traces of silver—impregnated with nitric acid, turned dark under the action of sunlight. Further investigations confirmed that it was silver nitrate—produced by a reaction between the acid and the silver—which had had that effect, and his continued experiments resulted in the creation of impermanent photograms of stencils, letters and other objects laid on the chalk.

His significant discovery was that it was light rather than heat which was creating this effect—a point picked up by his 1907 biographer Josef Maria Eder, who, with an almost apostolic zeal, declared him the true 'inventor of photography.' While Schultze recognised the purely scientific importance of his discovery and communicated his findings to the Imperial Academy at Nuremberg, he did not, however, recognise its future as the basis of an imaging system. That step would be made almost three quarters of a century later by, amongst others, Thomas Wedgwood.

Schultze died in Halle in 1744.

John Hannavy

SCIENCE

Towards the science of photography

Until the advent of today's digital age, the science of photography has predominantly been concerned with harnessing, exploiting, and controlling the effect of light upon silver salts. The science of photography, as it emerged throughout the nineteenth century, was concerned with expanding the understanding of both the physics of light and optics, and the chemistry of sensitive materials and their processing, maximizing the effect of light upon those salts. That photographic materials progressed, by 1900, from experimentation by enthusiastic individuals to mass production my multinational companies, underlines both the importance of the medium, and its commercial value. It also stands as a testament to the commitment of the early pioneers to share information, exchange ideas, and offer innovative suggestions to move scientific understanding forward.

For practical photography's first four decades, the picture-maker was also manufacturer and chemist, seeking to produce photographs using homespun chemistry which by its lack of consistency, introduced an almost infinite range of variables. Yet in so doing, the great photographers of the mid-Victorian era overcame major difficulties, and applied their limited technical and chemical understanding to the production some of the medium's most beautiful and enduring images.

In seconding the motion "That a Society now be established to be called 'The Photographic Society'" at the Photograph Society of London's inaugural meeting on 20th January 1853, Robert Hunt accurately summarized the importance of a forum for the exchange of scientific knowledge in the development of photography. His comments were reproduced in the first issue of the *Journal of the Photographic Society*:

> Mr Hunt, in seconding the motion, dwelt at some length on the importance and even the necessity of a Society to ensure the future progress of photography. He considered such an Association of practical men would be the best and most efficient mode of publishing and comparing the results of their numerous mutual trials, and pave the way for new discoveries. However rapid and satisfactory may have been the improvements in this science, much yet remained to be done. Reference was made to several phenomena, hitherto unexplained and still obscure, attendant on the results of photographic operations; for instance, it is known that the prepared paper is not acted upon by the yellow rays, while these rays do act upon glass prepared with collodion.

Hunt's account, while correctly identifying that the science of photography was, as yet, in its infancy, underlined that lack of understanding by incorrectly suggesting that the wet collodion plate had some sensitivity to yellow. Yellow sensitivity would, in fact, not be achieved until the early years of the 20th century when the introduction of dye sensitizers finally made a truly panchromatic emulsion possible. What Hunt was probably observing was limited green sensitivity manifesting itself as fogging under an imperfect yellow glass in the darkroom.

If the experiments of Thomas Wedgwood between 1795 and 1802 are taken as a starting point, photography, at the time Hunt was writing, was already more than half a century old—yet an understanding of the underpinning science was only in the very earliest stage of emergence. Wedgwood's inability to fix his pioneering images is often cited as an early example of poor photographic research—given that the ability of a range of chemicals to arrest the darkening effect of sunlight on silver salts had been identified by Carl Wilhelm Scheele and others much earlier. So, from photography's earliest days, an organized dissemination of relevant scientific knowledge would have been beneficial.

Robert Hunt was, himself, one of the leading figures in the advancement of the science of photography. His *Popular Treatise on the Art of Photography* had first been published in 1841, and he had completed work on the third edition of his *Manual of Photography*, first published in 1851, by the time of the Photographic Society's inaugural meeting.

The early years of photography were punctuated by a number of radically different approaches—independent inventors pursuing their shared goal by seeking to exploit fundamentally different chemistries.

Wedgwood and Davy opened the century with their experiments—reported in June 1802 in the *Journal of the Royal Institution* and later recounted by Henry Snelling in his groundbreaking 1849 book, *The History and Practice of the Art of Photography* (New York: G.P.Putnam, reprinted New York: Morgan & Morgan 1970).

> A piece of paper, or other convenient material, was placed upon a frame and sponged over with a solution of nitrate of silver; it was then placed behind a painting on glass and the light traversing the painting produced a kind of copy upon the prepared paper, those parts in which the rays were least intercepted being of the darkest hues. Here, however, terminated the experiment; for although both Mr. Wedgwood and Sir Humphrey Davey (sic!) experimented carefully, for the purpose of endeavoring to fix the drawings thus obtained, yet the object could not be accomplished, and the whole ended in failure.

While that report mentions that Wedgwood and Davy experimented with several different materials on which to brush their chemistry, only paper is specifically cited. Their other experimental surfaces included leather, and they noted that

> White paper, or white leather, moistened with solution of nitrate of silver, undergoes no change when kept in a dark place; but, on being exposed to the day light, it speedily changes colour, and, after passing through different shades of grey and brown, becomes at length nearly black …

and indeed their experiments proved markedly more effective with leather than with paper, due in part to chemicals contained within the tanned leather about which they knew nothing at the time. It would be a further thirty years before William Henry Fox Talbot demonstrated the practical application of their ideas, by recognizing the initial production of a 'negative proof' from which a 'positive proof' could be made by contact.

In 1816, Joseph Nicéphore Niépce, experimenting with silver chloride, got no further than had Wedgwood and Davy, again due to an inability to arrest the darkening effect of light. He too got within touching distance of producing the first photographic negative. Silver nitrate—the chemical Niépce abandoned—would later play a crucial role in the evolution of photographic materials. A decade later he turned his attention to a range of

chemicals which were physically hardened by the action of light and so, eschewing silver salts about which so much was already known in favour of bitumen of Judea, coated on to a sheet of glass, hardened by long exposure to light, and the unhardened areas then dissolved with oil of lavender. By 1826 he had moved to a pewter base and had announced his findings and produced what survives as the world's oldest photographic image.

By 1828 he had migrated from pewter to the silvered copper plate which would later become the base of the daguerreotype, and had returned to exploring the effect of light on silver salts—in this case silver iodide. Niepce's process, however, used iodine to darken the areas of silver where the bitumen had not been hardened by the action of light.

The daguerreotype evolved directly from the collaboration between Niépce and Daguerre, and after Niépce's death in 1833, between Daguerre and Isidore Niépce. Since Isidore's first attempts in 1840, many in the history of photography have sought to clarify the importance of Joseph Nicéphore Niépce's role in the evolution of the process which would help make photographic portraiture ubiquitous.

While the daguerreotype bears the Frenchman's name, the process which achieved such worldwide popularity progressed well beyond its inventor's achievements. The science of the daguerreotype was advanced significantly by many practitioners and scientists. Experiments by Antoine Claudet, for example, increased the sensitivity of the plate considerably, while arguably the most significant advance was John Frederick Goddard's discovery of the accelerating effect of employing bromine—reducing exposures for portraiture from the impractical to the practical. Despite the significance of his discovery, Goddard did not profit from his scientific breakthrough, and unlike Daguerre who received a French government pension, Goddard lapsed into poverty, saved only by a public appeal—promoted by John Werge and Jabez Hughes—which raised enough money to sustain him into old age.

In the 1840s, scientific innovation had no commercial value without the protection of a patent, and Goddard had not sought such protection, although arguably it was his innovation which ensured the daguerreotype's long popularity.

In a series of parallel developments,Talbot's experiments had taken him first to photogenic drawing and then to the calotype, establishing the negative/positive process as the ideal foundation for the development of photography as a low-cost and easily duplicated medium. Talbot's chemistry was simple, but by the early 1850s, albumen-on-glass, waxed paper and wet collodion had all brought both new refinement to the production of the negative, and a widening range of chemicals being used.

There was often little understanding of the role of each additional chemical—just a belief that adding them improved the reliability of the negative medium, and the consistency of the results.

Thus, in the first issue of the *Journal of the Photographic Society* for 1854, Washington Teasdale from Leeds published a comparison chart showing the differences and similarities between eight different versions of le Gray's Waxed paper process. The chart demonstrated the huge variations between the strengths of the chemicals employed by the process's main proponents—including Vicomte Vigier, Sir William Crookes, Roger Fenton, and le Gray himself. Teasdale's table and accompanying notes showed there was huge variation in the chemical composition and chemical strength of the different versions, the recipes ranging from a single chemical—potassium iodide on its own—in Crookes' version, to eight in Teasdale's, while the iodide in Fenton's published account was three times the strength of le Gray's original formulation. Such variations go a long way towards explaining why some users found le Gray's process unreliable and slow while others found Fenton's to be almost assured of success.

Variations in the chemistry of the waxed paper process was by no means unique. Every process had its advocates and its critics. With Frederick Scott Archer's wet collodion process, there were ultimately almost as many versions as there were users! As long as the manufacturing of the negative material was in the hands of the user, such wide variation in formulae was inevitable, as was the vigorous support each user gave to his 'improvement.'

In addition to claims about the performance of individual chemicals, there was often significant debate over who had prior claim to a particular process. Niépce's claim in France for a share of Daguerre's fame was mirrored in Britain by the Rev J. B. Reade's claim for priority over Talbot in the invention of the paper negative. At the time of Frederick Scott Archer's publication of the wet collodion process, Gustave le Gray, himself the inventor of the waxed paper process, claimed to have proposed—and used—a wet collodion process at least a year before Archer. (Like Goddard, Archer's generosity in seeking no financial reward for his process left him penniless, and after his untimely death in 1857 a fund had to be established to raise money for his widow.) Talbot, for good measure, claimed his patents gave him control over any process in which a negative was created from which prints could be made.

By the mid-1850s, however, photographic science entered a period of calm, with most patents being allowed to lapse, and the photographic community showing increasing altruism in sharing ideas and experience.

Many photographers soon appreciated the need for a measure of consistency in their chemistry, and

initiated self-imposed quality control and testing in their manufacture. In the 1850s, after preparing a new batch of waxed paper negative papers, the British photographer Samuel Smith, of Wisbech, Cambridgeshire, for example, would use the front of his house as a test subject to determine the sensitivity of the new material, and thus the exposure required. Collodion users would go through a similar routine to test the rapidity of each new mix of chemicals.

Despite the primitive chemistry and unsophisticated technology of the day, the quality of surviving imagery from the mid-Victorian period is a testament to the skill of the early photographers, despite the lack of sound scientific underpinning.

However, a widespread lack of understanding of the relationship between the colour temperature of the exposing light source, the spectral sensitivity of the emulsion, the exposure given to the negative, and the processing to which it was subsequently subjected, resulted in a range of visual phenomena in the negatives and resulting prints for which photographers had no ready explanation.

In the absence of simple measuring devices which would aid the estimation of accurate exposure, development was, invariably, continued 'until the image was brought out fully,' however long that might take.

An appreciation of the importance of consistent developer temperature, did not gain widespread acceptance until the end of the century. Despite recognition in the 1860s that the activity of the developer changed with the seasons, no connection was made between that and the importance of temperature consistency. Instead, it was suggested (Towler 1864) that a stronger developer was needed in the winter than in the summer, and that a more acidic developer was preferable in the summer, as the acid slowed the developer action down.

The combination of lower actinic values in winter daylight—causing under-exposure—and cold and under-active developers, resulted in many negatives which required considerably extended development until a printable density was achieved. This introduced increased fog levels, significant loss of shadow detail, and a loss of the subtle tonality which those same photographers could produce in summer.

Perhaps surprisingly, failure to recognize the cause of the problem persisted into the closing years of the century with Wall (1897) noting that 'speaking very generally, it may perhaps be estimated that development takes about twice as long in winter as in summer." Wall did, however, observe correctly that "under-exposure should always be avoided, as with these plates or films a considerable amount of over-exposure can be controlled in development, but if the light has not acted sufficiently on the plate no process of development can possibly make a good negative of it." In Wall's 1897 dictionary, he devoted several pages to 'Thermometers and Thermometry,' but included nothing of their application to photographic processing! The chemical composition of the developer, its strength and its rate of activity were all issues about which individual practitioners held strong views.

In many instances, good science emerged from heated debates between practitioners with opposing points of view, conducted in the meetings of photographic societies and literary and philosophical societies, or in the pages of the emerging photographic press. Often deteriorating into very personal attacks, these very public spats helped to progress scientific understanding, with the protagonists returning to their experiments to test and re-test their theories. The gentleman scientist—the enthusiastic amateur—seemed willing to endure the opprobrium of his peers in the cause of defending his point of view. There was little tangible benefit to the protagonists, except by being proved correct, but their perseverance eventually led to significant progress and enhanced understanding.

It was only with the advent of industrialization in the manufacture of photographic materials that good science acquired a commercial value. Once the manufacture of emulsions and materials moved from kitchen-sink to manufactory, consistency and reliability assumed a greater importance.

Amongst the first to produce ready-to-use gelatin-bromide dry plates were Wratten & Wainwright in London. Along with several other manufacturers, their 'repaid' dry plates went on sale in the late 1870s, and were initially met with 'scepticism and conservatism by the most eminent photographers' used to preparing their own materials from start to finish (Werge 1890). Initial reluctance, on the part of photographers, to abdicate their responsibility for emulsion preparation and coating to industrial concerns, was only overcome when those emerging manufacturers could demonstrate that their products offered benefits which the homemade preparations could not. Those benefits—initially more promised than actual—only really came to be understood and appreciated once the many chemical and physical components of photography were recognized as a single system rather than a number of disparate and unrelated elements.

Key to persuading professional users of the benefits of pre-coated plates was the introduction of scientific control over emulsion preparation, and the design of coating machines to ensure batch-to-batch consistency. Manufacturers such as Cadett & Neal, Marion & Company, and others, quickly recognized the commercial value of emphasizing the high quality of their materials and the consistency of results which their careful use brought to the user.

In working towards an understanding of the holistic

nature of the photographic process, the pioneering work of Ferdinand Hurter and Vero C. Driffield in England was pivotal. Their work on the relationship between development rate and temperature led them to recommend that 65ºF be adopted as the optimum standard, thus removing, at a stroke, the idea that development time should be extended in cold weather. Intriguingly, their recommendation was published in the journal *Photography* in 1893, four years before Wall's *Dictionary of Photography* perpetuated the idea of doubling time in winter!

But Hurter and Driffield's most significant and enduring contribution was the recognition that photography needed to be considered as a *system* where each component and each action was interdependent—that a deviation in any one aspect had an impact on the character of the final negative. While their proposal was not widely accepted or understood at the time, the various suggestions they made about standardisation, consistency, accuracy and repeatability established the foundation not only for the science of sensitometry, but also for a much wider appreciation of the physical and chemical inter-relationships upon which photography depends.

Their H&D speed system, based on the placing of the full tonal range of the subject on the straight line portion of the *characteristic curve*, came at the same time as a range of devices for estimating the actinic value of the illuminating light source. Thus, as the century came to a close, improved consistency in plate manufacture, coupled with reasonably accurate estimation of exposure and accurate processing, took photography into a whole new realm of consistency.

A number of actinometers were on the market by the 1890s, most using albumen printing-out-paper, and basing exposure on the time taken for the paper to darken to a pre-determined tone. The importance of such instruments as Green and Fuidge's Actinometer, Wynne's Exposure Meter, Watkins' Exposure Meter, and similar devices by Reid, Stanley, and Watt, cannot be underestimated—despite the fact that they used a blue-sensitive printing-out-paper to estimate the exposure required for orthochromatic emulsions—a problem noted by Werge without explanation.

The introduction of the Kodak camera in the late 1880s marked the birth of modern photography—with, for the first time, the science of manufacture and processing effectively separated from the art of photographic picture-making.

JOHN HANNAVY

See also: British Journal of Photography; Scheele, Carl Wilhelm; Hunt, Robert; Royal Photographic Society; Wedgwood, Thomas; Davy, Sir Humphrey; Daguerre, Louis-Jacques-Mandé;, Niépce, Joseph Nicéphore; Talbot, William Henry Fox; Hurter, Ferdinand, and Driffield, Vero Charles; Abney, William de Wiveleslie; and Wratten, Frederick Charles Luther.

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SCIENTIFIC PHOTOGRAPHY

"Magnificent," declared *The Photographic News*, referring to Professor Owen's opening address to the British Association in 1858:

> Photography is now a constant and indispensable servant in certain meteorological records. Applied periodically to living plants, photography supplies the botanist with the easiest and best data for judging of their rate of growth. It gives to the zoologist accurate representations of the most complex of his subjects, and their organisation, even to microscopic details. The engineer at home can ascertain …the most complex works on the Indian or other remote railroads. The physician can register every physiognomic phase accompanying the access, the height, decrease, and passing away of mental disease.

The speaker had been very prescient and within a few years, other writers echoed his words. In 1860, F.F. Statham referred to "the handmaid of the sciences," and four years later, a reviewer described photography as "the child of science," emphasising the freedom from fallibility in observations. Praise continued because of photography's ability to preserve a faithful image. "The sensitive photographic film is the true retina of the scientist," declared the eminent French astronomer, P.J.C. Janssen at a meeting of the Société Française de la Photographie in June 1888. The potential of photography to the scientific disciplines had been present from the beginning. In 1839, William Henry Fox Talbot had anticipated future developments by challenging his "photogenic drawing" to capture the image within his solar microscope. Many other investigators soon exploited the advantages of photography, and their research benefited from sharing reliable results with other practitioners.

In France, the daguerreotype process was also used with the microscope and, in spite of the lack of rapidity in the plate, Alfred Donné obtained satisfactory images

for demonstration to the Academy of Sciences in 1840. His philosophy was summarised: "… we shall let Nature reproduce herself … with all her details and infinite nuances." The poor response of his plate to daylight, however, prompted him to develop alternative lighting forms, and he successfully adapted the oxy-hydrogen torch as a light source for his microscope. By 1845, Donné and Léon Foucault had published an illustrated atlas of histological photomicrographs intended for teaching—"it is so to speak the object itself which will be placed before the eyes and in the hands of the audience."

There was no formalised programme for developing photography as a tool of the sciences. Whilst others accepted photography as an art form, the scientific practitioners welcomed photography as an aid to their work, and used it in different ways. Some realised that emulsion sensitivity extended beyond the boundaries of human vision and that it was possible, for example, to probe the night sky and secure ocular proof of their observations. At times, it was possible to dispense with lenses and optics, but instead, to build equipment designed to "write" direct to sensitive plates. At an early stage, analyses of solar and other spectra benefited by having images for comparison with other versions.

Practitioners in medicine, natural history and crime recognised the potential for creating standardised records, records that provided an image, which was adequate to serve as the original. Botanists were prompt to recognise the advantages over drawing, and when Anna Atkins made cyanotypes in 1843, she overcame difficulties "in the interest of the botanical value." Robert Hunt declared, "Specimens may be copied with a fidelity which cannot by any other means be obtained." At Surrey County Asylum Hugh W Diamond believed photographic evidence of his suffering patients would contribute to improvements in treatment. Staff at London Zoological Gardens undertook to compile a catalogue of "type specimens" from the animals in their collection and in 1871, unwittingly created a photograph of the last surviving quagga. Police services recognised the merits of "the rogues gallery" when a police sergeant from Bristol was able to identify "a hardened offender" in Birmingham.

Other disciplines of a scientific nature also annexed photographic techniques for recording aspects of their pioneering work. Liberated from free-hand drawing, archaeologists utilised photographic prints in lectures, in exhibitions and in publications. Space saving was welcomed by travellers. Prior to the use of photography, expeditions had relied on casting plaster images of the faces of native tribes. Photographic prints would serve ethnology just as well, stated *The Photographic News*. On any Arctic voyage, space was at a premium, but the merits of securing permanent records of the explorations were seldom overlooked, in spite of the hardships to be endured by the photographic officer, who was obligated to work in difficult conditions.

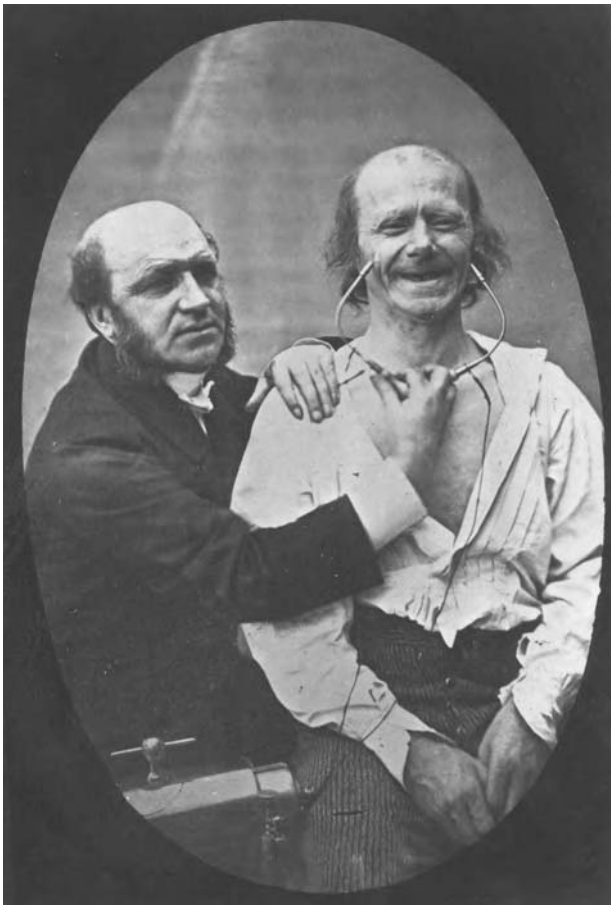
In astronomy, photographic recording became such an asset, that many of the astronomers made important contributions to photographic science. Janssen advised on good laboratory practice for photographing with the telescope, and valued photography—"[it] gives us today images of the sun in such perfection that they permit us to employ them in work of the greatest precision." For twenty years, he had cherished a belief that "a photograph … offers for purposes of measurement and examination such previous details that they surpass in value the observations of the most skilful astronomer."

At the observatory in Bonn in 1894, the first assistant, Dr. Julius Scheiner, devised a sensitometer for establishing reliable plate speeds for his photographic exposures, which subsequently evolved as the Scheiner speed system. Regular adjustments to equipment and techniques sometimes revealed the need for improvements to sensitised materials. For example, in 1884, Josef Marie Eder proposed a formula for orthochromatic plates, colour-corrected to improve rendition of yellow-greens. Early in the twentieth century, further improvements delivered the panchromatic emulsion.

The single astronomical record was valuable, but photography was a tool that could be applied to a constructive purpose. In 1882, some observers agreed to document stellar positions, but by 1891, eighteen worldwide observatories were working in co-operation to assemble a comprehensive dossier of the night sky. Such was the authority of the assemblage that the undertaking was not repeated until 1949. Similarly, in medicine, the compilation of an "atlas" of conditions often provided confidence to diagnostic procedures.

The applications of photography multiplied for two reasons. It provided results in a permanent form, and some techniques could be adapted to reveal data that were otherwise undetectable. Talbot's use of the solar microscope in 1839 had been successful, but within three years, he was demonstrating polarising microscopy, and showing its potential for crystallographic studies. In combining his enthusiasm for pictorial photography with his studies in crystallography (1853), Sir William Crookes admitted his motive had been to "retain in a more tangible form the well-known beautiful figures observed…" (That is, the distinctive ring structures that permitted identification of crystals.) However, Crookes' results provided a welcome surprise; his photographic plate revealed more than four times what he had expected from his visual observations, which, in turn, initiated further enquiries within the scientific community, and the evolution of standardised techniques.

The possibility of recording beyond the limits of the human eye was considered possible. Sir John Herschel had succeeded in identifying infrared radiation



Duchenne, Guillaume-Benjamin. Mechanisme de la Physionomie Humaine ou Analyse Electro-Physiologique de *l'Expression des Passions.*
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

by observing temperature change, and he forecast the likelihood of detecting energy in the "lavender" region of the spectrum (i.e., ultra violet radiation.). When the ultra violet spectrum was eventually recorded in 1864, it was the precursor for twentieth-century studies in atomic structure … and later, in 1935, ultra violet radiation was supplanted by the electron beam and a new style of microscopy evolved.

In 1851, Talbot demonstrated "an instantaneous photogenic image" to the members of the Royal Institution by exposing a page of *The Times* (which was fastened to a rotating drum) to the light from an electric spark. The relationship between photography and time now developed in different ways. High-speed photography had its derivation in the pistol camera of Thomas Skaife who made modifications that allowed him to capture what he termed the "epochs of time, inappreciable to our natural unaided organ of vision …"

Advances to the dry plate fulfilled the specification for recording shock waves. In 1888, Ernst Mach adapted August Töpler's schlieren layout and succeeded in preserving the distinctive patterns of currents that surrounded a bullet in flight. In 1893, CV Boys was engaged in studies intended to demonstrate the effects of a projectile (bullets) striking different materials, such as glass and metal. Photography was now providing a range of ideas on which to base experiments, to record sequences, and to compare results, all with certainty and confidence.

Photography offered other ways of capturing time. Experiments, which preceded the development of cinematography, exploited the ability to capture movement, and Eadweard Muybridge used photography when he set up a series of cameras in 1872 to study the motion of a horse. Success encouraged him to reduce exposure times and thus eliminate blur, by improving his chemistry and equipment. By 1878, he had secured sequences of horses walking, trotting, and galloping, men running and leaping, women dancing, doves in flight, water splashing and sufficient experience to synthesise his multiple images into an apparent single moving picture.

In France, Etienne Jules Marey, a physiologist, improved the idea and designed cameras for recording sequences on a single plate. His "chronophotography" was applied to many motion studies—locomotion, aerodynamics, vibration, blood circulation and heartbeats. When the Englishmen, William Frieze Greene, modified a magic lantern around 1886, he introduced a rotating shutter and four lenses to capture images, which gave the impression of movement.

Subsequent improvements to emulsions, to lighting and to timing equipment provided the basis of scientific techniques that continued into the heart of the next century, but some nineteenth-century investigators struck out in a different direction. They had realised the merits of using sensitised photographic material as a "self-recording" method, which would automatically indicate changes to the quality of light and other phenomena. Captain William de Wiveleslie Abney equipped a "sunshine recorder" with a discrete hole through which sunlight smeared its image on slowly-moving piece sensitive paper. To analyse the quality of daylight, Vero Charles Driffield modified the actinometer patented by his colleague, Dr. Ferdinand Hurter, and collected "daily diagrams of light" for twelve months during 1885 and 1886. From the mass of data, now accumulated on bromide paper, the two men designed the Actinograph exposure calculator.

Anxious to explore the solar spectrum (and improve the characteristics of dry plates for solar photography), Abney registered evidence of infrared radiation by directing sunshine, *via* the spectroscope, onto his photographic plate (1880). He had been confident "there are some faint rays which lie below the limit of the red." Eventually (1930), special plates were sensitised for infrared photography.

The x-ray, possessing unusual properties but detectable on conventional plates, was discovered by Wilhelm Röntgen in 1895. Working with a luminescent screen and a cathode ray tube, the hitherto unrecognised rays revealed themselves "by making darkness visible," when Röntgen placed his hand in the ray's path and revealed the internal bone structure. X-ray techniques opened the way to non-invasive probing of the soft tissues of the human body, teeth, fractured limbs, Egyptian mummies, precious stones, machinery and metal castings. The applications in medicine alone prompted *The Lancet* (1896) to describe the technique as "the searchlight of photography." It was seen as "photography of the invisible." Relishing the chance to photograph the invisible, Josef Maria Eder teamed up with Eduard Valenta in 1896 to produce a series of radiographic studies, that were acclaimed for their artistic content as much as the scientific disclosures.

Once the value of x-radiography was accepted, progress was swift. Exposures of quarter an hour were reduced to a few minutes and the nineteenth-century pioneering efforts contributed substantially to the twentieth-century techniques of ultra-sound, pulse echo recording, and tomography based on positron emission. Radiotracers were employed on cadavers in 1896 but by 1927, the technique of angiography had become an *in vivo* procedure. The first autoradiograph emerged in 1904, and in 1912, x-rays were used to produce diffraction patterns of crystals.

Not all the applications of photography were successful and many ideas for taking advantage of photography either failed to materialise, or did not fulfil the requirement. In a review of progress in 1888, Dr. C.H. Bothamley deplored the lack of "scientific method." His thesis was that few people had the ability to plan satisfactory experiments, and some research failed to establish "the existence of a given set of phenomena." In his opinion, investigators sometimes drew incorrect conclusions from their data, and Bothamley criticised results that did not distinguish between "that which is actually established and that which is only rendered probable or possible." His remedy was "systematic and somewhat severe training."

He recommended the photographic literature of the day, and accepted "progress must necessarily be slow until a better knowledge of the art of experiment … become more widely diffused…." The journals fulfilled their responsibility by publishing papers from the universities, academies and institutes in Europe and America. Just as important were the abstracts and reprinted texts from overseas journals, such as *La Nature* (France), the *Bulletin de la Société Françoise de Photographie, the American Journal of Photography,* and the *Philadelphia Photographer* (USA). *The Photographic News* included regular features from correspondents in Germany and France, and *The British Journal of Photography* maintained a column of continental notes and news.

Photography made satisfactory contributions to nineteenth-century science for three reasons:

- It was welcomed as a means of securing reliable proof that had a degree of permanence and could be distributed among colleagues
- It documented phenomena and scientific events in ways that replaced the need for human observations
- It could be allied to existing optical equipment, and could be incorporated in the design of new apparatus.

In making use of photography for constructive purposes, progress was never in doubt and a secure nineteenth-century foundation provided confidence for twentieth-century investigators, who then achieved advances as new materials, methods and techniques were introduced.

RON CALLENDER

See also: Société Française de la Photographie; Talbot, William Henry Fox; and Muybridge, Eadweard.

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SCOVILL & ADAMS

Photographic apparatus and supply firm

Scovill & Adams, a photographic apparatus and supply firm, succeeded the photographic division of the Scovill Manufacturing Company in 1889 with Washington Irving Adams (1832–1896) serving as President, Treasurer, and Secretary. The firm, which evolved from a company with a diverse history, originated as a gristmill on the Mad River in Waterbury, Connecticut in 1680. The mill, converted in the early 19th century to the gilt and brass button manufactory of Abel Porter & Co., was purchased by James Mitchell Lamson

Scovill (1789–1857), Frederick Leavenworth, and David Hayden in 1811. In 1827, Hayden and Leavenworth retired and James's younger brother, merchant William Henry Scovill (1796–1854), purchased the men's interest in what had become one of the two most prominent button factories in the country. Under the brothers' leadership, the firm, renamed J.M.L. & W. H. Scovill, grew in success and divisions, including an expanding auxiliary business of rolled brass and plated metal.

In 1842, J.M.L and W.H. Scovill became the first and largest manufacturer of daguerreotype plates in the United States after perfecting a plate that was flat and of a better quality than the popular French imports. According to the company papers at Harvard University, the company supplied such prominent daguerreians as Samuel Broadbent, Jeremiah Gurney, and A. Southworth & Co. To remain competitive over the next decade, the company expanded their photographic products line to include gilded metal mats, preservers, and cases. The New York City salesroom established in 1846 made over $60,000 a year in sales on mats and preservers alone. By 1851, the firm was advertised as a dealer of daguerreotype materials and promoted such novelties as a folding case for family portraiture and a case for sepulchral daguerreotypes.

In 1850, all the company interests, including the photographic division, were incorporated under the Scovill Manufacturing Company, which continued to grow in market outlets, production plants, and profits. In 1851, company agent Samuel Holmes established Western markets as far away as California. In 1857, the firm bought the factory of S. Peck & Co. in New Haven, Connecticut, which produced plastic photograph cases and camera parts, and in 1867 acquired the American Optical Co., a manufacturer of cameras and other photographic apparatus in New York. By 1873, company growth had led to the establishment of a branch of the photographic division in Birmingham, England and the completion of a new warehouse in New York City at 419–421 Broome Street containing offices, salesrooms, storage, and a darkroom for customers. By 1874, the profits of the photography division totaled over $1,000,000.

In 1868, Frederick J. Kingsbury accepted control of the company following the deaths of the Scovill brothers and the retirement of Scovill Buckingham, the Scovills'nephew. Under Kingsbury's administration, the photographic division of the firm prospered through the ingenuity of company upstart Washington Irving Adams. Adams, a former daguerreotypist, entered the employ of the Scovill Manufacturing Company as an entry clerk in 1858 and quickly acquired increasingly influential roles and responsibilities. Between 1870 and 1871 Adams assumed the leadership of the American Optical Co. and founded the company periodical, *Photographic Times*. In 1875, Adams became president of the S. Peck & Co. and in 1878 became the company agent in charge of the New York business. Adams also served as the first Vice-President of the Centennial Photographic Company and was a Chairman of the Executive Committee of the National Photographic Association.

Throughout the 1870s and 1880s, under Adams's guidance during the peak of a rivalry with E. & H.T. Anthony & Co., Scovill's interest in the photographic market diversified even further. In the early 1870s, prolific advertisements in the company periodical and the *Philadelphia Photographer* promoted apparatus and materials for every aspect of photography, including tripods, lanterns, developers, rollers, trays, negative frames, and studio props. The company also introduced the Scovill Photographic Series of training manuals. With the introduction of a multiplying camera in 1878, Scovill became synonymous with cameras as well. The company's cornering of the market in competition with Anthony & Co. progressed even further when around 1881 Scovill became the sole distributor of Carbutt dry plates, a move that signaled Adams's business savvy in anticipating the growing amateur market. Consequently, in 1882 the Scovill Manufacturing Company began advertising cheap amateur outfits that included camera, dry plate holder, tripod, and lens. In 1885, the Waterbury view camera was introduced as a part of the profusely advertised outfits and quickly became an American classic. During this time, the company also displayed its photographic equipment at several exhibits, including annual exhibitions of the National Photographic Association and the Photographic Association of America as well as the Centennial Exhibition of 1876, where the company received an award for photographic apparatus.

Given the success of the photographic department and following George Eastman's 1887 rejection of a Scovill offer to consolidate photographic businesses, Scovill Manufacturing Co., opted to form an independent firm, Scovill & Adams, which manufactured, sold, and acted as agents for photographic equipment and supplies. With the creation of the new firm in 1889, Scovill & Adams became a leading innovator in camera design and earned several patents related to camera construction. Between 1891 and 1898, the company introduced the Henry Clay folding camera, one of the first self-casing, folding bellows cameras; the Solograph folding plate camera; a spy camera; and a panoramic camera equipped with a swinging lens. The new firm continued to publish the *Photographic Times* and the renamed Scovill & Adams Photographic Series of training manuals. It also remained a leading supplier of photographic equipment and apparatus nationally and internationally, including Central and South America.

Adams ran Scovill & Adams until his death in 1896, whereupon his son Washington Irving Lincoln Adams, editor of *Photographic Times*, assumed operation of the company. Under the younger Adams, the firm entered into the manufacturing of roll film in 1899.

On December 23, 1901, Scovill & Adams and their main competitor of fifty years, E. &H.T. Anthony & Co., merged and formed Scovill & Anthony with a joint capital stock worth $2,500,000. In 1902, the firm relocated principal operations to Binghamton, New York, and, in 1907, changed its name to Ansco. In 1928, Ansco merged with the film company Agfa, and the new company focused on the manufacture of film. In 1939, General Aniline & Film Corp, known as GAF, merged with Agfa-Ansco and the company, later renamed Anitec, continued operation until 1998.

ERIKA PIOLA

See also: Camera Accessories; Camera Design: 5 Portable Hand Cameras (1880–1900); Carbutt, John; Daguerreotype; Dry Plate Negatives: Gelatine; and Eastman, George.

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SCOWEN, CHARLES T. (active 1873–1890)

English, photographer and publisher, active in Ceylon

Charles Scowen arrived in Kandy, Ceylon (Sri Lanka) in early 1873. He worked as a clerk for some period of time but by 1876 he had opened a photographic studio. In 1885, the firm which bore his name, Scowen & Co. had studios in Kandy and Colombo. Scowen & Co. offered an extensive catalogue of sensitively photographed studies of native people, as well as the antiquities and landscapes of Ceylon. During its existence, there appear to have been several Scowens involved in the operation of the studio—Charles T. Scowen returned to England in 1885, and C. Scowen was listed as proprietor until 1891, M. Scowen was proprietor in 1893 when the firm changed hands and the companies stock, including negatives, was taken over by the Colombo Apothecaries Co. Photographs credited to Scowen & Co were used as illustrations in a number of books about Ceylon and the tea trade.

KATHLEEN HOWE

SEARS, SARAH CHOATE (1858–1935)

American photographer and painter

Sarah Choate Sears was born in Cambridge, Massachusetts, in 1858 to Elizabeth Carlisle and Charles Francis Choate, a lawyer. In 1877, she married the wealthy real estate magnate Joshua Montgomery Sears and became a prominent member of Boston Society. She studied painting at the Cowles Art School and the Museum of Fine Arts School in Boston during the 1870s. She began to receive recognition for her watercolors by the 1890s. In the next decade she turned her attention to photography, producing portraits and still lifes in the pictorialist style. She became active in promoting photography as an aesthetic medium along with Frederick Holland Day and was influential in ensuring photography's inclusion in Boston's Society of Arts and Crafts inaugural show in 1897. She was granted a solo exhibition at the Boston Camera Club in 1899. She was also a member of the British pictorialist association, the Linked Ring and the Photo-Secession. After her husband's death in 1905, she abandoned her work as an artistic photographer and dedicated herself to collecting contemporary art and supporting the work of other photographers, particularly the photographers of the Photo-Secession. She died in West Gouldsboro, Maine, in 1935.

ANDREA KORDA

SEBAH, JOHANNES (JEAN) PASCAL (1823–1886) AND JOAILLIER, POLICARPE (1872–1947)

The Constantinople-based photographic studio Sebah & Joaillier—formed from a partnership between Johannes (Jean) Pascal Sebah and Policarpe Joaillier which dates only from 1890, but from its establishment, took over the marketing of the catalogue of fine images produced in Turkey and Egypt by Pascal Sebah. Sebah operated a studio in Constantinople from the 1860s, and also worked in Egypt from 1873. The same images, therefore,

have been marketed by the studio at various times as being the work of P. Sebah, J. P. Sebah, or Sebah & Joaillier.

Folowing Pascal Sebah's death in 1886, the Turkish studio was operated by his brother Cosimi for a time, who also trained Pascal's son in the art of photography. Johannes, known as Jean, reputedly joined the business aged 16, took it over at aged 18, and immediately entered into a partnership with Policarpe Joaillier. Joaillier returned to France in 1910, but with subsequent partners, Jean Sebah remained actively involved with the studio until 1943.

From the 1870s, Sebah, and later Sebah and Joaillier, were major suppliers of evocative imagery to the increasing number of people who to undertook the Victorian Grand Tour. Their studio images of Egpytians and Nubians in 'traditional' costumes and undertaking 'traditional' tasks were highly popular, and indeed had been Pascal Sebah's *Les Costumes Popularies de la Turquie* published to critical acclaim in 1873.

JOHN HANNAVY

SEDGEFIELD, WILLIAM RUSSELL (1826–1902)

English photographer

William Russell Sedgefield was born in Wiltshire, England, in 1826, and by the age of sixteen had applied to Talbot for a licence to practice the calotype as an amateur, while at the same time pursuing his training as an engraver. He progressed from calotype to waxed paper and both wet and dry collodion, and in a lifetime devoted to the medium, became one of the most critically acclaimed photographers of his generation. His acquaintances included the great publishers of photographic views Francis Frith and Francis Bedford.

Amongst his publications were *Photographic Delineations of the Scenery, Architecture and Antiquities of Great Britain and Ireland*, published in several parts in 1854, and *The Thames Illustrated with Photographs*, also in several parts (1866). He contributed works to several photographically illustrated books, most notably William and Mary Howitt's *Ruined Abbeys and Castles of Great Britain* in 1862 where his images appeared together with contributions by Bedford, Roger Fenton, George Washington Wilson, and others.

Sedgefield exhibited his work at many exhibitions from 1854, and from 1859 his many series of stereoscopic views were widely distributed. He continued in professional photography until his retirement c.1890, with premises in various locations in the London area, but the topographical nature of his most important work took him all over England and Wales.

JOHN HANNAVY

SELF-PORTRAITURE

The first photographic self-portrait was made just weeks after Arago announced Daguerre's invention in the French Council of Deputies in 1839. Like Niepce, Daguerre, and Talbot, Hippolyte Bayard had labored for some time at inventing a permanent photographic image. He was on the verge of success when Arago made his dramatic announcement, which conferred fame, as well as a sizeable monetary stipend, upon Daguerre. Bayard's response was a remarkable self-portrait in which he depicted himself in the nude as a drowned man. On the back of one print he wrote a note explaining that the drowned man had ended his life in despair after learning that Daguerre had beaten him to the acclaim and the money. He pointed out that the discoloration in his face and hands were signs of the flesh's deterioration, and warned the viewer of the corpse's odor. This first self-portrait was groundbreaking in several respects. It is the first known self-portrait in the nude by any artist since Durer (Durer's 1503 drawing is full frontal nudity, while Bayard's groin is covered.) Moreover, there is a self-directed humor in Bayard's image that many subsequent photographers would echo. To our eyes, Bayard's picture seems prophetic not just regarding the images that other 19th century photographers would produce, but for the performance art that emerged later in the twentieth century.

Many photographers, including Bayard, made more conventional self-portraits in which they presented themselves as serious people deserving of respect. Photography was revolutionary in its ability to make likenesses of people that would outlive them, a privilege that had previously been reserved for those very few who could afford to commission their own portraits. Photographers were no less prone to desires for immortality than anyone else, and accordingly self-portraits flourished. In addition, photographers, like painters, seized upon the genre as a way of advertising their abilities, often posing themselves beside their cameras or photographs. Photographers presented themselves as serious image-makers, and adopted the head and shoulders, direct gaze conventions of formal portraiture. Self-portraits became one mechanism through which photographers presented themselves as deserving the status of artists.

However, the self-dramatizing and playful elements that Bayard introduced also recurred throughout the 19th century. One is tempted to suggest that there is something in the photographic process itself that encourages this kind of plasticity and role-playing. These behaviors were not, of course, the exclusive prerogative of photographers, as they predated the birth of photography by many centuries. Rembrandt's self-portraits, for example, portrayed a man moving through a variety of social stations, as signaled by his amazing array of hats,

gold chains, and cloaks. Jan Steen portrayed himself as an anti-hero, often occupying the central position in paintings that depicted the chaos of unruly households, taverns, and debauchery in general. And when Caravaggio depicted David holding Goliath's decapitated head in triumph, he modeled the ogre's head after his own. But photographers of the 19th century approached the genre with an exceptional degree of freedom and experimentation. Among others, Charles Negre, Roger Fenton, Antoine Samuel Adam-Salomon, and Francis Frith enjoyed donning costumes and posing as various Romantic and exotic figures.

Nadar's and O. G. Rejlander's self-portraits are especially notable cases in point. Nadar made numerous self-portraits throughout his lengthy career, including straightforward head and shoulders images and family portraits with his wife and son. He sometimes donned outrageous costumes and wigs, probably chosen from the compendious wardrobes he kept in his studio. Nadar also photographed himself as part of two of his many entrepreneurial projects. He made at least one self-portrait in the Paris catacombs as part of a series on the expansive underground network in Paris. These photographs represented the first underground photographs as well as one of the earliest successful efforts to use artificial light in photography. The process of sitting for the catacomb self-portrait, which among other things provided a sense of scale for the unfamiliar underground setting, proved to be an especially arduous undertaking because of the very long exposure time and the cool and damp conditions. In a subsequent picture, Nadar spared himself the inconvenience and used a dummy rather than himself. Nadar was also an investor in the development of hot air ballooning, which became something of a passion for him. He used it as an opportunity to make the first aerial photographs, and also to pose himself (looking not entirely comfortable) in the gondola of one the balloons.

Across the English Channel, O. G. Rejlander was no less eclectic and eccentric in his interests. He posed himself in various guises, ranging from Greek philosophers to Garibaldi. He included himself in several humorous tableaus. In one scene, Rejlander scratches his head in confusion as a gypsy peddler tries to con him with an array of products, while in another image he whispers gossip into another man's ear about an unseen young woman. In several of the illustrations for Darwin's *On the Expression of the Emotions in Man and Animals* (1872), Rejlander used himself as a model, histrionically posing in images that supposedly represented indignation, surprise and other emotions. He used the combination printing technique that he pioneered in the mid 1850s to create a self-portrait of himself presenting an alter-ego version of himself as a militiaman. In *Happy Days*, Rejlander and his wife Mary smile broadly as they embrace one another, an unusually upbeat depiction of middle-aged love. There is a *joie de vivre* in Rejlander's self-portraits that is rare not only in 19th century photography, but in the entire history of the genre. Both Rejlander and Nadar in large measure reject the melancholic and self-important postures that many self-portraitists adopted, in part, one senses, because they were simply having too much fun playing with the photographic possibilities.

Some of the same elements continue through memorable American self-portraits near the turn of the century. In a dizzying photograph, William Henry Jackson posed himself at the edge of a high and precipitous rock outcropping in Yosemite (c.1895). The legs of the tripod are spread to the extreme edges of the small rock as Jackson studies the canyon on the ground glass. In dramatizing the considerable risks that many landscape photographers undertook in the practice of their art, such images valorized the courage of the photographer.

In 1898, F. Holland Day took different kinds of risks when fasting for several weeks in order to depict himself as Christ in a crucifixion series. The series includes close-ups of Day's head, topped with a crown of thorns, as well as photographs of his emaciated, nearly naked body nailed to the cross. These self-portraits are extraordinarily realistic, which accounts for some of the controversy that they occasioned when first exhibited in Boston.

Two other pairs of self-portraits are emblematic of how the genre developed in the late nineteenth century. Edward Steichen made numerous self-portraits throughout his long career, but two of his earliest are among the strongest in the medium's history. In one, made in Milwaukee in 1898, a young, casually dressed Steichen stands near the edge of the picture's frame, peering rather uncertainly into the camera. Beside his head hangs a small empty frame on an otherwise blank wall. The picture has a tentative quality to it, suggesting a young man who is just beginning to emerge as a distinct personality. The other self-portrait was taken four years later, after Steichen had moved to Paris. Now Steichen depicts himself as a painter (which in fact he was at the time), applying a brush to a palette in a beautifully composed and heavily worked photograph. He is dressed in sumptuous clothes worthy of a Rubens self-portrait. In this picture, Steichen presents himself as the very picture of success and self-assurance. Whether these two photographs represent an actual metamorphosis in Steichen's personality is open to question, but there is little doubt that the two *projected* selves could not be more different.

Similarly, Frances Benjamin Johnston constructed two very different selves in 1896. In *The Proper Victorian*, Johnston, in her early thirties, poses herself as a society matron, a genre in which she had developed

a considerable reputation amongst political and high society women in Washington. She is decked out in furs and an elaborate hat, her head resting on an elegantly gloved hand as she peers directly into the camera with an expression combining haughtiness, intelligence, and perhaps just a hint of vulnerability. Her expression is accentuated by the carved human head on her chair, which glares at something beyond the picture's edge. In the other self-portrait, Johnston is the "Proper Victorian's" polar opposite: she sits before a fireplace holding a beer stein in one hand and a cigarette in the other. Her legs are casually crossed, prominently displaying petticoats and an ample sweep of calves. She looks away from the viewer with a strong, unsmiling mien. The lack of eye contact reinforces the impression of a tough, no-nonsense woman making her way in a man's world. There's nothing seductive or feminine about her. This woman is fully self-contained, breaking the rules without a hint of apology.

Steichen's and Benjamin's self-portraits at the dawn of the twentieth century may be seen as efforts not just to reflect or project themselves through self-portraits but also to construct multiple selves using the photographic medium. From the first self-portrait of Bayard onwards, photographers were often drawn to the plastic and theatrical possibilities that they discovered in photography. Photographers during the nineteenth century increasingly used the medium to examine and portray the multiplicity of selves that would come to preoccupy psychologists, sociologists, historians, and countless artists in the century to come.

DAVID L. JACOBS

SELLA, VITTORIO (1859–1943)
Italian photographer

Vittorio Sella was born on 28th July 1859 in Biella, where his father, Giuseppe Venanzio, a scientist and photographer, founded one of the most important Italian woollen manufactures. In 1856 he published *Il Plico del Fotografo*, the first Italian treatise on photography. Vittorio's uncle, Quintino, a government minister, founded the Club Alpino Italiano in 1863. Vittorio attended a scientific high school and afterwards he worked in the family firm. He learned photography from his father and thanks to him he also became interested in exploring and mountaineering. In the course of his life he took thousands of photographs of the Alps. From 1879 he worked with scientific rigour on many extraordinary photographic *reportages*, taken while climbing in the Italian Alps. He also travelled abroad; in 1889, 1890 and 1896 he was in the Caucasian mountains; in 1897 he took photographs during an ascent of the mountains of Alaska with the Duke of the Abruzzi. In 1899 he was in Sikkim in Nepal, and in Africa with the Duke of the Abruzzi again. He made ascents in the Himalayas (1899, 1909) and took photographs during a trip to Morocco. His photographs were widely circulated for their quality and variety and they were found useful by geographers, topographers and alpinists. Vittorio Sella died in Biella on 12th August 1943.

SILVIA PAOLI

SENSITOMETRY AND DENSITOMETRY

When Hubert Davy repeated the experiments of Thomas Wedgwood in 1802, he attempted to convey the rapidity of his photosensitive preparations and stated, "… the part concealed by it *[the light]* remains white, the other parts speedily become dark." Some years later, William Henry Fox Talbot also found the need to indicate the speed of his materials, and he quantified an experiment by combining the intensity of the light ("I employed the full sunshine") and the time of exposure—"*half a second*" (Talbot's italics).

In the same year (1839), Mungo Ponton drew attention to a "cheap and simple method" that relied on the behaviour of light on potassium bichromate to form an image. He claimed his material was "equally sensitive with most of the papers prepared with salts of silver" but admitted, "it is not sufficiently sensitive for the camera obscura …" He had already identified that "the active power of the light … resides principally in the violet rays" by an experiment using light filtered to violet, yellow and red.

Antoine Claudet initiated experiments in 1848 that he hoped would increase the sensitivity of the daguerreotype process to daylight. In order to quantify the response of his plates, he built a device that he called the Photographometer, and which provided controllable conditions of exposure. Like other workers, Claudet relied on assessing his results by eye.

Unwittingly each of the early practitioners had provided the basis for the subsequent study of sensitised materials. Sensitometry became particularly important when photographers no longer prepared their own materials but relied on plates manufactured by a third party. The introduction of dry plates brought a need for reliable testing in the factories, and a means to audit the claims for improved speed. Consequently, the role of sensitometry took on an importance that led to continuing improvements in the practice of photography. For example, an understanding of the behaviour of sensitised materials contributed to the design of actinometers to improve exposures during carbon printing, and to the accuracy of exposure calculators, which replaced exposure tables.

As a rule, three requirements were required for a sensitometric study:

- Equipment for making a consistent exposure to a plate,
- Implementation of an agreed development protocol,
- A means of accurately measuring the ensuing densities.

The designs of the first sensitometers incorporated ingenious exposing devices. Leon Warnerke relied on an energised phosphorescent block of calcium sulphide for his exposing source. James Spurge (working with J.D. Mucklow) proposed a system of tubes that channelled controlled amounts of daylight onto the test plate. Exposing through "a screen" (a step wedge) impressed a set of numbers on the negative and, after development, the first identifiable number established the rapidity of the plate. For example, in 1890, Marion & Company advertised their Ordinary dry plates as "Averages 19–20 Warnerke's Sensitometer" and advised users to "double the exposure of the Instantaneous," which had an average rapidity of 24–25 (on Warnerke's scale).

Before then, however, some workers had encountered conundrums, which were not resolved until sensitometry improved. In 1874, William de Wiveleslie Abney noticed a disparity between time of exposure and intensity of light whilst examining the opacity of his negatives. By the time he had solved the riddle, he had developed his own method for measuring the deposits on negatives and was confidently testing photographic materials objectively.

To measure the transparency (or the opacity) of a negative, Abney used the shadow photometer that Benjamin Thompson (Count Rumford), had designed to compare the strength of different forms of artificial lighting in 1793. Although Abney introduced improvements to the instrument by inserting rotating sectors (i.e., a system of variable apertures), which were positioned in front of one of two light sources, he retained Rumford's principle of balancing the intensities of the two shadows projected on a screen. The amount of adjustment that was necessary to achieve the match indicated the opacity of the deposit.

A limitation of the method when applied to photographic work was the need to use relatively large specimens. Warnerke's sensitometer and Abney's photometer for measuring density (that is, a densitometer) were pragmatic solutions devised to solve specific questions as they occurred. When practitioners appreciated the value of sensitometry and densitometry, the techniques improved and evolved as an important branch of photographic science.

By 1888, Ferdinand Hurter and Vero Charles Driffield had begun to collaborate on experiments in photographic chemistry. The initial work had been undertaken with a view to improving the calculation of camera exposures, but their investigations were later directed towards understanding the action of light on photographic emulsions. To make their studies comprehensive, Hurter and Driffield standardised their tests by exposing plates to the light of a standard candle, modulated by a rotating disk designed to control the amounts of light reaching the plate. They also specified a standard developer (ferrous oxalate) and described apparatus they had made for making measurements.

Hurter and Driffield also introduced the word "density" to describe the individual amounts of silver that were produced during development, and by plotting density measurements against the given exposures, they constructed a curve, which displayed the characteristics of the sensitised material being examined. Hurter and Driffield formed their conclusions from a range of density readings, (instead of the single number obtained by Warnerke), and their technique was consequently more reliable. From their characteristic curve, they were able to determine the sensitiveness of plates, and by the end of the 19th century their method was recognised and accepted as the H & D Speed System.

A contemporary of Hurter and Driffield, Henry Chapman Jones, described his densitometer in 1895, which he claimed as an improvement on other designs because he had been "desirous of getting a more simple arrangement." His achievements were to eliminate the need for two light sources (the reference beam and the measuring beam), to reduce the loss of light in the optical system and to measure in "one simple movement.." Jones's densitometer remained popular until improved designs were introduced in the 20th century.

RON CALLENDER

See also: Ponton, Mungo; Warnerke, Leon; Marion & Son, A.; Abney, William de Wiveleslie; and Hurter, Ferdinand, and Driffield, Vero Charles.

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SEVASTYANOV, PETR IVANOVITCH (1811–1867)

Archeologist, traveler, photographer

Petr Sevastyanov was born in 1811 to the family of merchants who were honorary citizens of the town Krasnoslobodsk in the Penza province. In 1831 he graduated from the Moscow University. Commissioned by the Ministry of Justice he worked in Perm, Tiflis (T'bilisi), and St. Petersburg. In 1852 he was honored with the title of the Full Secret Counselor. While staying in Paris in 1858, Sevastyanov took lessons in photography for a month from the photographer Belloni preparing himself for an expedition to Athos.

Sevastyanov organized two expeditions to Athos. The first important series of photographs devoted to the Holy Mountain was taken during the first expedition in 1857; the second expedition lasted for 14 months (1859–1860). Painters, architects ,and photographers took part in these expeditions. Sevastyanov photographed the rare manuscripts and icons of the Athos monasteries. He brought 1300 negatives back with him. Sevastyanov's prints made it possible to read the manuscripts' faded ink texts. This was the first instance where photography aided the restoration of such rare documents.

In February 1858 Sevastyanov made a report "On photograpy in application to archeology" in Paris on the basis of the first Athos expedition. In 1861 and 1862 Sevastyanov's prints were a success in St. Petersburg and Moscow exhibitions. Sevastyanov was the first to use photography to the document research on Athos monasteries.

Sevastyanov died in St. Petersburg in 1867.

ALEXEI LOGINOV

SHADBOLT, GEORGE (1819–1901)

English

North London timber merchant George Shadbolt was an early experimenter in micro-photography and a leading figure of the Microscopic Society.

He was a founder member of the Photographic Society and exhibited many subjects at its 1854–1857 exhibitions using wax-paper, wet-collodion and his own 'collodion honey process' to produce his favored matt salt prints—he disliked the 'glare' of albumen paper. He was also a member of the Photographic Exchange Club.

Shadbolt's earliest exhibits were portraits, some enlarged from small negatives (he appears to have used his camera as a form of enlarger, using gaslight to make the prints). His later studies were all views made in and around Hornsey, North London, which then was then quite rural.

Shadbolt contributed several articles to the *Journal of the Photographic Society* and the *Liverpool & Manchester British of Photographic Journal* which later became *The British Journal of Photography*. He was also vice president of the North London Photographic Association and a member of the Amateur Photographic Association.

He seems to have retired from photography around 1864, however, his son Cecil became a pioneer aerial photographer, taking vertical pictures from a balloon in 1883. C.V. Shadbolt also photographed the Holy Land, illustrating H. A. Harper's *Walks in Palestine,* published in 1888. He was killed in a ballooning accident in 1892, his father died nine years later.

IAN SUMNER

SHERLOCK, WILLIAM (1813–1889)

English

Sherlock was born at Lambeth, South London, in 1813, his father, also William, was a solicitor and William junior followed his father's profession. In 1843 Sherlock wrote to William Henry Fox Talbot requesting permission to open a London photographic portrait studio. After several exchanges, Talbot offered the concession for Bristol, but Sherlock declined.

Sherlock contributed over 40 photographs to the 1852 Society of Arts London Exhibition, all but one from paper negatives. The subjects depicted rural scenes: A Group of Peasants, Pollard Willows and Rustic Bridge were typical titles. By 1855 he was using wet-collodion to produce his negatives, printing on salted paper.

Sherlock's large body of work was originally attributed to John Whistler but as Ken Jacobson has shown in his 1996 work *Etude d'Apres Nature*, this was an incorrect assumption due to a large number of his works in the collection of the Whistler family.

In exhibitions between 1852 and 1859 Sherlock showed almost 200 rustic studies, many entered by the print seller J.Hogarth. His work has also been confused with that of the French master Humbert de Molard and much of his work is in the French style. He gave up his profession as an attorney and became a full-time photographer in the late 1850s and moved from London to South Devon, where he lived until his death in 1889.

IAN SUMNER

SHEW, WILLIAM (1820–1903)

William Shew first made his mark as a daguerreian artist and case maker in Boston before moving to California, where he took photographs for more than 50 years.

Born near Watertown, New York, he began making daguerreotypes there in 1841 with his three brothers after learning the process directly from Samuel F. B. Morse. The four brothers moved from Watertown to Ogdensburgh to Rochester and to Geneva, New York, establishing galleries in each city, before settling in New York City.

From 1841 to 1844, Shew managed John Plumbe, Jr.'s Boston gallery. Around 1844, he began making miniature cases and continued in that line of work for several years. From 1849 to around 1851, he resumed taking daguerreotypes in Boston.

Shew arrived in San Francisco by ship around 1851 and established a portable gallery that he operated until moving into more permanent quarters on Clay Street. He was burned out of this location and moved to another on Montgomery Street, where he remained for 20 years. He was also active in local politics and served on the local Board of Education. In 1901, more than 50 years after settling in San Francisco, Shew was still operating a photo gallery on Kearny Street.

BOB ZELLER

SHIMOOKA RENJØ (1823–1914)

Japanese photographer

Shimooka Renjø is generally thought of as one of the "two fathers of Japanese photography," along with Ueno Hikoma. Shimooka was born as Sakurada Hisanosuke in Shimoda in 1823. His father was an official shipping agent for the Tokugawa military rulers. Shimooka moved to Tokyo at the age of thirteen to seek training as an artist. He later served an apprenticeship with a master of the traditional Kanø painting school, Kanø Tøsen. He may have first seen foreign daguerreotypes while serving as a guard at the Shimoda artillery battery in the 1850s. He was so impressed by their realism and detail that he decided to learn photography. Shimooka acquired his first formal training in the medium around 1860 from an American photographer in Yokohama named John Wilson. When he left Yokohama in 1861 or 1862, Wilson also gave Shimooka his first camera in exchange for a painting. In 1862 Shimooka opened a studio in Yokohama, one of the first Japanese-run photography businesses. He produced studio portraits primarily for foreign tourists, as well as staged photographs of locals that also appealed to foreign tastes. He later managed a number of studios in both Yokohama and Tokyo, and trained many of Japan's early photographers. By 1877, Shimooka no longer worked as a photographer, though he continued to paint photographic backdrops and panoramas. He died in 1914.

KAREN FRASER

SIDEBOTHAM, JOSEPH (1824–1885)

Calico printer, botanist and entomologist, pioneer photographer

He was involved with several early experiments in the search for stable dyestuffs for textile printing and had an enduring interest in microscopy. Sidebotham was a prime mover in the establishment a 'microscopical section' in the Manchester Literary & Philosophical Society in the late 1850s (becoming its Vice-President), and a photographic section in the 1860s. Through the 'Lit & Phil,' he became acquainted with John Benjamin Dancer (qv)—from whom he purchased microscopes and developed an interest in micro-photographs—James Mudd (qv), Alfred Brothers (qv) and many other early photographers. He was a long-serving member of the Manchester Photographic Society, and a regular speaker at the society's meetings. One of the earliest demonstrations of the workings of a rotary camera shutter was that given by Sidebotham in 1856. He served as the society's Vice-President from 1861 until 1865. With James Mudd, he experimented with variants on the waxed paper process in the 1850s.

Sidebotham lectured and wrote extensively on photography and his essays on the collodio-albumen process, and on contemporary printing processes published in *Recreative Science: A Record and Remembrance of Intellectual Observation, Vol. II.* (Groombridge and Sons, London, 1861), were considered important contributions to the published account of photography.

JOHN HANNAVY

SILVESTER, ALFRED (UNKNOWN)

Alfred Silvester's blindstamp can be found on some of the most elaborate and beautifully tinted genre stereocards of the 1850s and 1860s, yet the only record of his studio at 118 New Bond Street, London is from an 1864 trade directory. No personal details have yet been located.

His exhibition record comprises two portraits by wet collodion shown at the 1855 Exhibition of the Photographic Society, and forty of his celebrated stereographs at the 1858 Edinburgh exhibition of the Photographic Society of Scotland.

Silvester's stereos were usually produced in small sets of three or four cards, or in much larger series, with a strong moral theme and narrative character, and they could be purchased either card mounted for viewing by reflected light in the drawing room stereoscope, or as tissues for viewing by transmitted light. Themes like *The Hero's Wife* and *The Dream of the Wedding* were popular entertainment. *Look Before You Leap* linked sound advice with a strong Masonic theme, and depicted aspects of Masonic ritual, while his most celebrated genre card, *Guardian Angels* was one of his most overtly religious. Similar treatments of many of the themes in Alfred Silvester's stereographs were published by his major rivals John Elliot, and the London Stereoscopic Company.

JOHN HANNAVY

SILVY, CAMILLE-LÉON-LOUIS (1834–1910)

French photographer

Camille Silvy was born at Nogent-le-Rotrou, a market town to the west of Chartres, on May 18, 1834, to Marie Louise and Onésipe Silvy, descendents of a notable Provençal family with possible Italian roots. When his father, mayor of Nogent, was appointed director of a Paris bank in 1835, he moved his family with him.

As a child, Silvy was taught drawing by Hippolyte Lalaisse, a teacher, lithographer, and painter of portraits, genre scenes, and animals. Silvy studied law and graduated in 1852 taking up a minor diplomatic post. He took up photography when he took a trip with Lalaisse to Algeria in 1857 and realized his inadequacy at obtaining exact views of the places he traveled through. He made photographs and drawings on this trip, particularly of Kabylia, newly conquered by France.

Silvy joined the Société française de photographie in 1858 and exhibited at the Salon the following year. Silvy was one of a number of photographers who donated prints to be sold to raise funds for the organization. Most of the views he exhibited at the Salon were taken close to his birthplace, at Gaillard at La Croix-du-Perche or in Nogent-le-Rotrou. Like those of many of his contemporaries, Silvy's photographs were made from large, wet collodion glass negatives which most likely processed his plates in one of the family's houses in the area.

Silvy's most well known photograph was taken near Nogent-le-Rotrou of the river Huisne in 1858, and is known today as "River Scene, France." The version in the Société française de photographie, where Silvy exhibited the print for the first time in 1859, was originally given the title "Vallée de l'Huisne."

Although it was made just a few years following the inauguration of the Grande Ligne de l'Ouest from Paris that passed through Nogent, "River Scene, France" gives no indication of this new industrial access to Paris. The scene is one of quiet, picturesque contemplation where one's eyes can explore the intricate and carefully composed details in the middle ground where riverside houses, boat docks, and trees are reflected in the smooth mirror-like surface of the river. The glass negative allowed a greater sharpness as well as faster exposure speed. The people positioned along the riverbank in *River Scene*, though staged, did not have to stand stiffly in order to be rendered. The composition is reminiscent of topographic prints of the time, aimed at creating picturesque views of leisuring tourists in a landscape. However because Silvy's photograph lacks picturesque monuments such as the nearby Romanesque castle and a church, he seems to be more interested in the scene as that of local residents, enjoying their own beautiful spot.

Because clouded skies were challenging in early photographs, Silvy used a method first invented by Hippolyte Bayard and made famous by Gustave Le Gray that is to take a separate negative of a cloudy sky and splice it with the negative of landscape in the printing stage. In addition, Silvy had to paint in parts of the main cluster of poplar trees as well as along the horizon in order to blend the two negatives. Because of his success with these techniques as evident in "River Scene," Silvy is recognized as one of the great craftsmen of photographic printing.

In a review of the exhibition at the Société française de photographie, Ernest Lacan praised Silvy's landscapes: "These are ravishing *tableaux* which have the merit of being as true as nature herself, while borrowing from art a glamour which gives poetry to the most ordinary places" (*Photographic News*, July 9, 1859, 1). Such critical acclaim along with the writings of Louis Figuier, a well-known science journalist, who declared Silvy's photographs to be ". . . true pictures in which one does not know whether to admire more the profound sentiment of the composition or the perfection of the details . . ." (L. Figuier, *La Photographie au Salon de 1859,* Paris, 1859, 9) placed Silvy at the head of the modern French landscape school.

In addition to landscapes, Silvy also made still-lifes, such as *Trophées de chasses* of rabbits, game birds, and fish hanging symmetrically like realist still-life paintings of the time. In 1859 a wood engraving for the weekly *L'Illustration* was made after his photograph of a group of citizens in Paris gathered around a posting put up by Napoleon III before his departure for Italy to join the

Silvy, Camille. Les Petits Savoyards (Street Musicians).
The J. Paul Getty Museum, Los Angeles

fight against Austria. The image combined reproductive technology, politics, and a moment of history in the making. Silvy was also meant to travel with the Italian campaign to make photographs but the French army succeeded in their mission before Silvy could receive his papers to go.

In 1859, Silvy moved to London and established a portrait studio. There he made carte de visites, recently patented by the Frenchman Disderi, which makes him most likely the first *carte-de-visite* photographer in London. Soon Silvy moved to a large and spacious portrait studio in Porchester Terrace, Bayswater. Within two and a half years he had taken close to seven thousand portraits of famous and upper class citizens. He photographed individuals and groups in elaborate studio settings as well as arrangements of figures in landscapes.

Beyong the studio, Silvy continued to be inventive with the medium. In the late 1850s he created a series of studies of light and weather as well as a series of street scenes. Silvy made photographic reproductions of early manuscripts, particularly the "Sforza Manuscript" in which he discovered that photography, because it could capture yellow ink and render it as black, could also play a restorative role as well as a documentary one. When a major controversy over whether photography could be exhibited in the Fine Arts section of the 1862 International Exhibition occurred, Silvy, who was a member of both societies, stood in favor of photography's industrial classification. Silvy was also an inventor of machines, such as a cylindrical camera body that could house a rolled waxed-paper negative and in 1867 he made a panorama of the Champs Elysées to demonstrate his invention. He invented the idea of a tripod that could keep a lens horizontal to the ground for surveying. Silvy experimented in making print runs of photographs in ink and worked in photoceramics and photographed tombs in the Dreux chapel in Normandy by magnesium light.

As the *carte-de-visite* phenomenon died down, Silvy ended his portaiture studio in London in 1868 and moved back to France. He took up the post of *agent consulaire* of the French government at Exeter from 1868 to 1870 but returned again to France when the Franco-Prussian War broke out, and served as a lieutenant in the Eure-et-Loir department. He later published two pamphlets describing the campaign. Like many workers in photography in the nineteenth century, Silvy's life was ended prematurely by cyanide of potassium poisoning. Silvy entered an asylum in 1881 and died there in 1910.

KAREN HELLMAN

Biography

Camille Silvy was born at Nogent-le-Rotrou, France, on May 18, 1834. Silvy studied law and graduated in 1852 taking up a minor diplomatic post. He took up photography during a trip to Algeria in 1857. Silvy joined the Société française de photographie in 1858 and exhibited at the Salon the following year. Like those of many of his contemporaries, Silvy's photographs were made from large, wet collodion glass negatives. Silvy was known primarily for his landscape scenes taken around his native town in France but he also made still life studies. In 1859 he moved to London and established a portrait studio where he was possibly the first carte de visite photographer in London. In the late 1850s he created a series of studies of light and weather, a series of street scenes, and several photographic reproductions of early manuscripts. In the 1860s Silvy invented a cylindrical camera body that could house a rolled waxed-paper negative and in 1867 demonstrated his invention with a panorama of the Champs Elysées. He also invented the idea of a tripod that could keep a lens horizontal to the ground for surveying. In 1868 Silvy closed his studio and moved back to France. He took up the post of *agent consulaire* of the French government at Exeter from 1868–1870 but returned again to France when the Franco-Prussian War broke out, and served as a lieutenant in the Eure-et-Loir department. Like many workers in photography in the nineteenth century, Silvy's life was ended prematurely by cyanide of potassium poisoning. Silvy entered an asylum in 1881 and died there in 1910.

See also: Société française de photographie; Wet Collodion Negatives; and Cartes-de-Visite.

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SIMPSON, GEORGE WHARTON (1825–1880)

Editor and writer

George Wharton Simpson succeeded Thomas Sutton and Editor and Proprietor of the fortnightly journal *Photographic News* in 1861, a position he held until his death in 1880.

A prolific writer, he contributed essays, in addition to his own journal, to *Photographic Notes, The Photographic and Fine Arts Journal* and the *British Journal of Photography.* His writings were reprinted extensively in *The Philadelphia Photographer, The American Journal of Photography and the Allied Arts & Sciences, Humphreys Journal* and *Photographic World* amongst others.

He wrote two important books—*The Photographic Teacher: or What to do in photography, and How to do It: a Clear and Concise Compendium of the Collodion Process* was published in 1858 by H Squire & Co of London, and *On the production of Photographs in Pigments: containing Historical Notes on Carbon Printing and Practical Details of Swan's Carbon Process* was published by T Piper in London in 1867.

He became Vice President of the Photographic Society of Great Britain, and was also elected to the same post at the South London Photographic Society.

In his obituary, (*BJP*, January 15 1880) his early career as Editor of the *Darlington & Stockton Times* is mentioned, as is the fact that he practised as a professional photographer 'for some years' before taking over the editorial chair at *Photographic News*.

JOHN HANNAVY

SKAIFE, THOMAS (1806–1876)

English photographer and studio owner

Thomas Skaife was born in 1806, marrying circa 1829 and having one son, Wilfred (1830–1862). He operated photographic studios at various addresses in London from 1860 until 1867 and exhibited as a miniature painter at the Royal Academy from 1846 to 1852.

He took up photography in early 1856 and in June patented a rubber-band powered flap shutter to facilitate instantaneous photography. He became increasingly attracted to instantaneous photography and he produced a series of stereo photographs for the War Department showing the trajectory of the shell from a mortar.

His most prominent contribution to photography was the introduction of his Pistolgraph camera in 1859. Skaife, inspired by a suggestion made by Thomas Sutton in the *Photographic Journal* of July 1858, designed a camera fitted with one of his own flap shutters. He re-designed the camera in 1859 to make use of 1 inch

square glass plates. The camera was called the Pistolgraph. Skaife's camera was sold with several types of lenses including a wide aperture Dallmeyer f/1.1 portrait lens. The plates could be enlarged successfully 10 to 15 times by projection, by enlarged negative or by use of a solar camera.

Skaife's camera attracted much interest in the photographic press and Skaife licensed the use of the camera to other photographers to produce 'pistolgrams' or 'pistolgraphs.' It was deemed particularly applicable for taking portraits of children, old people, and animals.

Skaife died on 18 November 1876 at Preston, near Steyning, Sussex, aged 68.

MICHAEL PRITCHARD

SKEEN, WILLIAM LOUIS HENRY (d. 1903)

English, photographer, publisher

William Louis Henry (W.L.H.) Skeen was the proprietor of a large commercial photographic company active in Ceylon (now Sri Lanka) from the late 1860s through 1903, with studios in Colombo and Kandy. His father William Skeen, the first official government printer for Ceylon, purchased a studio for his son after he his return from photographic training in London. During its existence, W.L.H. Skeen & Co was the premier photographic firm in Ceylon. The company offered an extensive catalogue of views of landscapes, studies of tribal peoples and ethnic groups, and documented the tea plantations and spice works. Skeen & Co. held commissions to record many of the major construction projects—railway projects and the construction of the Colombo Breakwater in the 1880s. The company published J.W.W. Birch's photographs of Polonnaruwa around 1876. Skeen & Co. received the coveted "photographers by appointment to the Duke of Edinburgh" during his tour of 1870. In addition to views of Ceylon, in the 1890s the firm offered a series of views of India—Bombay, Jaipur, Delhi, Agra, Darjeeling—probably acquired through purchase or trade with another commercial studio. Skeen & Co. photographs were exhibited at major international exhibitions from 1870 to the end of the century and its operations. It appears the Platé & Co. acquired its negatives when it closed in 1920.

KATHLEEN HOWE

SKY AND CLOUD PHOTOGRAPHY

Photography was invented as the meanings and uses of sky and cloud in art were in flux. In paintings, skies were once typically conveyed as the realm of gods; cloudless, infinite and timeless, often blocked out with celestial gold. If a cloud was present, it was a symbol of divine wrath. From the early Renaissance artists began to fill images of skies with clouds and birds, seeking to evoke a specific space and time. By the nineteenth century, sky and cloud in art could be romantic, evoking emotional states or spirituality, but could also be scientific or realist, used to image atmospheric effects, highlight the time of day or document nature.

At a time when the West was surveying unknown lands, it was also exploring the infinite, daunting sky. Photography played a role in the demystification of sky and cloud, providing what was considered objective evidence of natural processes. In 1896, the *International Atlas of Clouds* was published, incorporating photochromatypes of different types of cloud, by the international meteorological committee—a concern thus spanning the entire century. However, it was actually in the early 1900s Jean Baptiste Lamarck and Luke Howard worked on classifications for clouds.

The night sky was also documented. Lunar daguerreotypes of George Philips Bond and John Adams Whipple were shown at the 1851 Great Exhibition at Crystal Palace, London, and were so popular that they went on tour in Europe. The subsequent wet-plate collodion prints by Warren De La Rue, along with Lewis Morris Rutherford's albumen print 'The Moon, New York' (1865) continued to spark the interest in lunar photography. As well as looking to the skies from Earth, Gaspard Félix Tournachon, or Nadar, famously took his camera up in the hot-air balloon, attempting 'aerostatic photography' from 1858 to record the earth from the sky.

Cloud and sky were aesthetic as well as scientific subjects. In nineteenth-century art the empiricist doctrine of depicting a specific place at a specific time, and aiming to show atmosphere, was pursued by artists such as Claude Monet, John Constable, Joseph Mallord William Turner and James McNeil Whistler. Images recording 'effect' gained scientific value and appeared more 'truthful' and desirable. Summing up mid-nineteenth-century art, Ruskin stated in 1856, that 'if a general and characteristic name were needed for modern landscape art, none better could be invented than "the service of clouds".' Photographs were used as an aid to drawing and painting natural landscapes. Many people considered them equivalent to a sketch, although less subjective and less artistic. In the 1870s for example, the French artist Gustave Courbet was concentrating on skies and seas, making photographs on which to base his paintings.

Skies could be cloudless for both technical and aesthetic reasons. From the 1840s skies in photographs were often blank due to the fact that the material's sensitivity was selective and restricted, which prevented the photographer to acquire detail in a dark foreground (for example 'At Compton, Surrey, 1852–54' by Ben-

jamin Brecknell Turner). Often photographers tried to achieve an empty sky for stylistic reasons. Japanese photographs were closely linked to the woodblock tradition that made use of large single-tone spaces: Kusakabe Kimbei's 'Fujiyama' (c.1880) is a coloured albumen print with a flat sky. The empty sky in Carleton E. Watkin's 1860s photographs (of the type to be disseminated as artistic prints and postcards), highlights the sublime in the iconic landscape of the American west at Yosemite. In the 1890s, the British photographer Peter Henry Emerson sometimes used a white, blank sky to evoke distance and fin-de-siecle emptiness (for example 'The Bridge,' a photo etching from *Marsh Leaves*, 1895).

J. M. W. Turner, discussing paintings, breached the artistic concern of making an opaque two-dimensional surface reflect light. In photography, the appearance of the sky depended on the characteristics of the methods and paper used, and how light would reflect off the surface. The mirror surface of the daguerreotype reflected light and added interest to void skies (Horatio Ross's daguerreotype 'Craigdacourt,' 1848, for example). Watercolourists and calotypists both used Turkey Mill paper to render the sky mottled and interesting. Hill and Adamson's work reveals the blurred effect, creating texture and shape, caused by the way in which the paper absorbed chemicals. Journals suggested improving blank, white skies when using a paper negative by blackening the verso with ink, and when using a glass negative by painting the verso red or yellow.

Imaging clouds demanded technical skill and astounded viewers, who were unused to seeing romantic symbols in such a scientific context. It was a technical challenge until photographic papers became more reactive than the early albumen papers of the 1850s, and so alternative methods were used. Clouds were often painted onto the backs of negatives. Farnham Maxwell Lyte revealed in 1861 that tufts of cotton could be placed the glass negative and the printing frame to achieve clouds. Alternatively, the part of the negative showing the sky could be covered during exposure in the darkroom, so that the detail was not lost.

It became common practice to superimpose one negative of clouds onto a negative of a landscape, creating a photomontage to achieve detailed sky and land in one photograph. Frenchmen Camille Silvy and Gustave Le Gray, and Englishmen F. M. Lyte and Roger Fenton were amongst the nineteenth-century photographers who used this innovation. Silvy's 'River Scene, France' (1858), is an early example of this technique, and was praised in *The Photographic Journal* (5, 1859) for its 'exquisite and varied detail,' although Silvy was also criticised for using 'artifice to make picture, not take a picture" (Paris review by Louis Figier, 1859).

Roger Fenton's study 'September Clouds' (1859), emulating Constable's paintings of clouds, was used in a number of different landscapes to give a model sky to each image. His photographs were first shown in Britain and sold well to an international market. The blatant manipulation of superimposing negatives to artistic ends was a concern for Le Gray, who insisted that photographs preserve the 'truth' but who also used photography as an artistic printmaking process, as in 'The Solar Effect—Ocean' (1857). Sky and cloud made Le Gray famous; his many seascapes selling well.

Nineteenth-century photography of sky and cloud was caught between the contemporary concerns of art and science. Echoing the painterly obsession with imaging the atmosphere, it acted as a catalyst for technical innovations in the 1800s, and the development of scientific skill and artistic taste. Photographs of sky and cloud sold brilliantly to a large market as fine art prints, postcards, or stereoscopic views. The subject was used to varying effect in different situations: highlighting majesty of mountains, emphasising vastness of land or sky, contributing to propaganda of empire, documenting new theories and discoveries, aiding explanations of natural processes, and advancing photography as an art.

SOPHIE LEIGHTON

See also: Aerial photography; Fenton, Roger; Le Gray, Gustave; Lunar photography; Night Photography; Pictorialism; Silvy, Camille.

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SLINGSBY, ROBERT (d. 1895)

English photographer

Robert Slingsby was a professional photographer working in Lincoln from circa 1859 where he was also described as a stationer and dealer in artistic supplies. He joined the Photographic Society in 1869 and was a regular exhibitor of work in the Society's annual exhibition from 1863 initially showing examples of his portrait work and local views but gradually showing more staged genre and art studies.

Slingsby contributed a number of articles to the British photographic press usually addressing portraiture and matters of interest to the professional studio photographer. In his 1873 piece entitled 'A few notes on portraiture,' he described his method of sensitising plates, his studio and posing methods and later pieces commented on backgrounds and the need for an orderly routine in the studio, all based on his own experiences. He had two patents granted in 1875 and 1876 relating to the use of skylights in photographic studios.

In 1880 H. Baden Pritchard visited Slingsby's Lincoln studio and reported on the visit in detail for the *Photographic News*. He noted that Slingsby's photograph *Alone* which had been exhibited at the Photographic Society's exhibition had earned him £450 and was continuing to sell. The article described Slingsby's studio and working methods in some detail.

Slingsby's more important contribution to photography was his work on the development of flash light for photography. As early as 1869 he had a photograph reproduced in the *Illustrated London News* that had been produced using artificial light and between 1890 and 1891 he was granted four patents relating to the use of magnesium for flash photography one of which related to a shutter that could be synchronised to the discharge of magnesium.

Robert Slingsby died in Lincoln on 16 August 1895 leaving an estate totalling £1552 13s 10d.

MICHAEL PRITCHARD

SMEE, ALFRED (1818–1877)

The scientist, ophthalmic surgeon, and metallurgist Alfred Smee was an important and prolific writer on electricity and electro-biology, and was an early pioneer in the understanding of the electrical stimulation of nerves and muscles.

Smee, a fellow of the Royal Society, was co-founder of the London Opthalmic Hospital, and ophthalmic surgeon to the Bank of England, and a friend and collaborator with Charles Babbage. Recent researches have confirmed him as an early pioneer of the concept of artificial intelligence.

He was also interested the potential value of batteries in the electrolytic preparation of chemicals, and, in 1842, supplied Sir John Herschel with some of the potassium ferricyanide—a key chemical in Herschel's cyanotype process—which he had made from potassium ferrocyanide by what he termed 'electrolytic oxidation.' Several surviving letters from Smee to Herschel attest to his wide interest in the chemistry of early photography.

An article by Smee "Photogenic Drawing" was published in *The Literary Gazette and Journal of Belles Lettres* on May 18, 1839 (314–316). In that article Smee recognised the future value to photography of gallic acid, and also predicted the importance of iron proto-sulphate, observing that "photogenic paper may be blackened" by a dilute solution of the chemical. Iron proto-sulphate, or ferrous sulphate, was later recognised, by Robert Hunt in 1844 as a developer.

In his book *Elements of Electro-Metallurgy* (Longman, Brown, Green and Longman, 1841), Smee included a chapter 'On Multiplication of the Daguerreotype' (134–135).

JOHN HANNAVY

SMILLIE, THOMAS W. (1843–1917)

American photographer

Washington, D.C., photographer Thomas W. Smillie served as the Smithsonian Institution's first photographer when hired part-time beginning in 1869. Educated in chemistry, Smillie pursued his passion for photography at the Institution while continuing to work as a commercial stereo photographer. By 1871, Smillie's position was made full-time with responsibilities to photograph and document museum collections, buildings, and scientific research. He developed traveling exhibitions, the first for the Ohio Valley Centennial Exposition at Cincinnati in 1888. Smillie arranged for this display by acquiring or borrowing historic and contemporary photographs and camera equipment, such as Samuel F. B. Morse's daguerreotype camera and accessories, and the 1888 No. 1 Kodak camera. He continued to correspond with working professional and amateur photographers, and manufacturers to record the history of the science, technology and art of photography. In 1896, Smillie was named the first honorary custodian of the newly formed Section of Photography at the Smithsonian, the first such unit in an American museum. Smillie maintained an active collections and exhibitions program while remaining staff photographer. As a mentor, he taught photography to many apprentices preparing them for work with U.S. government agencies. In 1913, Smillie opened the first Hall of Photography in the Smithsonian's U.S. National Museum. He remained at the Smithsonian until his death in 1917. Today, this important collection is housed in the Smithsonian's National Museum of American History, Photographic History Collection.

MICHELLE ANNE DELANEY

SMITH, BECK & BECK

The firm of Smith, Beck and Beck dates from 1857. Its origins lie with James Smith (died 1870) an optician and optical turner working from 1826–1847 who had made the brass work for Joseph Jackson Lister's (1786–1869) achromatic microscope. Smith took Lister's nephew

Richard Beck (1827–1866) as an apprentice and they commenced a formal partnership in 1847 which continued until 1857 when they were joined by Beck's brother Joseph Beck (1829–1891), who had been apprenticed to the important optician and instrument maker William Sims.

The Smith, Beck, and Beck company was primarily an optician and optical instrument maker with microscopes being a particular speciality. As Smith and Beck the firm introduced stereoscopes to the range of goods it produced including a top-loading hand-held model. The firm's most successful viewer was based on Joseph Beck's patent number 2112 of 15 September 1859 which described a viewer designed for viewing paper stereo pairs either mounted on card or in books. The open-body viewer was sold as the Patent Mirror Stereoscope.

A refined version was produced with solid sides which inverted into it's own box and was sold as the Achromatic Stereoscope in either walnut or mahogany. Various designs of cabinets to hold the viewer in its box and stereographs were produced. The viewer was very effective and consequently became very popular with over 3000 being produced. It was still being advertised in 1890.

Alongside the stereoscopes Smith, Beck and Beck was also publishers and retailers of photographs including cartes-de-visite portraits and they claimed to keep in stock 'some thousands' of stereoscopic views with others readily obtainable. The most notable of the stereographs published by the firm was Warren de la Rue's celebrated series of lunar photographs taken on his reflecting telescope and enlarged by Robert Howlett. These were sold as both paper and glass stereographs.

Smith retired from the partnership in 1865 and c1867 the firm began trading as R and J Beck, becoming a limited company in 1895. Joseph's son, Conrad, was apprenticed to the firm in 1879 and later ran the company and published several books on optics. Thomas Smithies Taylor was also apprenticed to the company in 1879 and in 1886 he founded his own firm which was to become Taylor, Taylor and Hobson of Leicester, another successful photographic lens manufacturer.

By the 1880s R. and J. Beck's photographic lenses were mainly being exported to the United States and by the end of the decade they had doubled manufacturing capacity to meet the demands of the home market. The company was the first to fit an iris diaphragm on a regular basis to its rectilinear lenses from 1887. Although the firm manufactured some Voigtländer lenses under licence and a limited range of its own quality lenses it increasingly produced lenses directly for camera makers such as W Butcher & Sons, Newman and Guardia and others.

The company made several distinctive cameras. The first true twin lens reflex camera was made by R. and J. Beck for G. M. Whipple (1842–1893), superintendent of the Kew Observatory to his own design, in 1880. It was designed for cloud photography. A later cloud camera was made by Becks to Robin Hill's patent in 1924. From 1892 Beck introduced a successful range of cameras under the Frena name with the third thousand being supplied in 1894. The camera was based on Joseph Thacher Clarke's patents and held one or two packs of twenty cut-films, specially made for them by Ilford Ltd, which were changed by rotating a handle on the outside of the camera. Further models were made through to the early 1900s.

During the twentieth century, the firm increasingly focused on supplying lenses and specialist optical instruments before moving away from photographic optics. It underwent several mergers but remains in existence as Coherent Ealing (Europe) Ltd producing specialised high precision opto-mechanical assemblies.

MICHAEL PRITCHARD

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SMITH, JOHN SHAW (1811–1873)

Irish amateur calotypist

John Shaw Smith belonged to the Anglo-Irish landed gentry, born in Clonmuth, County Cork, South Ireland, on October 18, 1811, the fifth of eight sons of John and Mary Richardson Smith. He settled in the family's house of Fairy Hill in Blackrock, on the seaside north of Dublin, and in 1839 he married his first cousin, Mary Louisa Richardson, from whom he had two children, John Augustus (born in 1840) and Florence (born in 1844). His life ended tragically on January 29, 1873, when he shot himself.

His work with the calotype process stands out in the early history of photography in Ireland for the extensive photographic tour that he took along the Mediterranean shores, between December 1850 and September 1852. Before taking this trip, he practiced the calotype process in Ireland, documenting the ruined landscape scenery of his surroundings—the Celtic Graveyard at Blackrock, the monastic settlement at Glendalough—and taking a short trip to Paris, in August 1849. It is not documented whether he had any personal contacts with the French calotypists, but his Parisian views reveal his awareness

of their work, as well as of Lerebours' *Excursions Daguerriennes* (1842–1843). It is likely that Shaw Smith was exposed to photography from its beginnings, as the new invention was announced in 1839 in the "Proceedings of the Royal Irish Academy." Possibly, he knew the work by Scottish calotypists Captain Henry Brewster (Sir David Brewster's son), in Dublin in 1842, and John Muir Wood, in Ireland in the late 1840s. The work of Irish gentleman William Holland Furlong, corresponding with Talbot in the early 1840s, might have also come to his attention.

John Shaw Smith mastered the calotype process, reading a paper about his modification of Blanquart-Evrard's wet-paper process for use in hot and dry climates, at the Dublin Photographic Society in April, 1857 (published in the *Journal of the Photographic Society* on April 21, 1857, and in the *Liverpool and Manchester Photographic Journal*, on May 15, 1857). His modification consisted in adding "bromure d'iode" to the iodizing bath in preparation of the calotype negative (using Whatman's paper and, for higher temperatures from 70 to 85 degrees, Canson's paper). The addition of "bromure d'iode" caused the time exposure to be longer but allowed the paper to remain in good condition for a whole day in high temperatures. The paper was excited in the morning and developed the same evening. The geography he toured along the Mediterranean shores elicits comparison with similar itineraries taken by Calvert Jones (1841, 1845–1846), George Wilson Bridges (1846–1852), and the French calotypists in Egypt, beginning with Maxime Du Camp in 1851.

He photographed the monuments and sceneries of Italy, Greece, Turkey, Egypt, the Sinai peninsula, Palestine, the ruins of Petra, Lebanon, Syria, Malta, and, on his way back, Switzerland. He carefully documented this trip, writing date and location on each negative, organizing each group with geographical headings, and keeping also a travel diary. After 1861, he printed his calotype negatives of Egypt as albumen prints in a two-volume album of seventy-two views with autograph text pages. The photographs of Shaw Smith's tour were not published, and were exhibited only once in his lifetime, in the photographic section at the Dublin International Exhibition in 1865, together with works by Antoine Claudet, Julia Margaret Cameron, O.G. Rejlander, Thomas Annan, Francis Frith, Francis Bedford, where Shaw Smith was awarded an honorable mention for "good productions from paper negatives."

The Grand Tour of John Shaw Smith began in December 1850 in Rome, where he made eighty-one photographs (the largest group in his trip together with those made in Egypt), which followed a preconceived iconography of the Catholic-Roman capital, and sought for picturesque sceneries along the Tiber River, and the surroundings of Tivoli. He was one of the last amateurs who yielded to the lure of Italy with the paper negative, and it is likely that he gathered with the international group of artists and photographers at the Caffe' Greco. He continued the trip south, reaching Naples and Pompeii, taking pictures of the ruined landscape with the Vesuvius in the distance, which echo Calvert Jones' earlier calotypes as well as Charles Dickens' literary observations.

He traveled by steamboat between Naples and Athens, with a stop in Malta, quarantine station between Europe and the Eastern countries. The photographs of Athens reveal his political involvement with the romantic figure of Lord Byron, searching for the house where this hero lived and died during the Anglo-Greek war, and looking for traces of British power over Greece. He continued to Constantinople and Alexandria, stopping in Smyrna, Cairo, and taking a boat-trip along the Nile. He approached the Egyptian ruins in a similar way he photographed the Roman sites, visiting the monument in its architectural context and making progressive sequences that presented each structure and views from a variety of perspectives.

Many photographs taken in the Eastern countries (Petra, Jerusalem, Baalbec) recall his work in Ireland, where ruins are enmeshed in a quiet and deserted landscape, with atmosphere of spiritual and natural decay. The aesthetic rendering of the texture of the stones into the fibers of the paper negative reached its peak in the records of the tombs of Petra, where he arrived as earliest calotypist in history. As for many early photographic travels, the one by the Irish John Shaw Smith raises questions about his own personal engagement with the sites, his cultural and political background, and a growing tradition of organized itineraries, guidebooks, and architectural documentation.

The whole extent of John Shaw Smith's calotype work (346 calotype negatives and 191 salted paper prints) is conserved in two major photographic collections—the Harry Ransom Humanities Research Center at the University of Texas at Austin (from the collection of Helmut Gernsheim) and the George Eastman House in Rochester (from the collection of Alden Scott Boyer)—and, in minor part, in the Photographic Society of Ireland in Dublin.

Maria Antonella Pelizzari

Biography

John Shaw Smith is the only known Irish calotypist who took an extensive trip along the Mediterranean, in Italy, Greece, Turkey, Egypt, the Sinai peninsula, Palestine, Lebanon, Syria, Malta, and Switzerland, between 1850–1852. A smaller body of work documents Irish Celtic ruins, and a trip to Paris. He was born in Clonmuth, County Cork, South Ireland, on October 18,

1811, and was part of the Anglo-Irish landed gentry. His relationships with Scottish, Irish, and French calotypists of his time are possible but not documented. He used Blanquart-Evrard's wet-paper process, improving it for the use in hot and dry climates, and he was a member of the Dublin Photographic society, founded in 1854. His work was not published and was exhibited only once, at the Dublin International Exhibition in 1865. He ended his life tragically, when he shot himself, on January 29, 1873. His large body of work reveals an amateur skilled at the early photographic process, with a good knowledge of other calotypists' works in Europe and the Near East.

See also: Calotype and Talbotype; and Travel Photography**.**

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SMITH, SAMUEL (1802–1892)
English

Samuel Smith, known locally as 'Mr. Philosopher Smith' on account of his amateur enthusiasm for all things scientific, lived much of his life in Leverington near Wisbech, Cambridgeshire, England, where he 'retired' in the late 1840s after a short but successful career as a timber merchant. He was an amateur astronomer, geologist, microscopist and microscope-maker, and photographer.

He developed his interest in photography c.1851, and between 1852 and 1864, produced a remarkable body of work using le Gray's waxed paper process, sometimes working with Thomas Craddock. His subjects were the ships, buildings and industry of Wisbech, and despite the challenges of the slow waxed paper process, his images present an evocative picture of the Cambridgeshire town.

He prepared his waxed paper negative materials in batches, testing each new batch by photographing Malvern House, his Leverington home. Several of Smith's negatives bear annotated exposure details, confirming exposure times of between ten and fifteen minutes. Thus, for his many views of sailing ships on the River Nene, low tide was the only time photography was practicable.

There is no evidence that Smith ever used wet collodion. He stayed with the waxed paper process until the mid1860s—making him one of the last photographers in the country to employ paper negatives. After 1864, he abandoned photography to pursue his other interests.

JOHN HANNAVY

SMITHSONIAN INSTITUTION

The Smithsonian Institution was established by act of the United States Congress in 1846. Although this legislation provided for scientific and cultural research with a library, a museum and an art gallery proposed, much of the research and collecting for the first decades of the Institution focused on the scientific interests of Secretary Joseph Henry. Photography was first displayed at the Smithsonian during an 1869 exhibition documenting Native American delegations visiting Washington, D.C., Ferdinand V. Hayden of the U.S. Geological Survey and William Blackmore were influential in supporting the exhibition. Alexander Gardner and Antonio Zeno Shindler of Washington photographed many of the nearly four hundred portraits which became part of the Natural History collections. In the same year photographer Thomas W. Smillie was hired as an independent contractor to document buildings and specimens in the Smithsonian. By 1871, Smillie was appointed the first photographer for the Smithsonian and given a staff position to run the photography unit in the Department of Preparation.

Smillie, with the support of Smithsonian officials like Secretary S.P. Langley, Assistant Secretary G. Brown Goode, and Graphic Arts Curator Sylvester R. Koehler, expanded the scope of his work to include preparing Smithsonian traveling exhibitions related to the history of photography. The first of these exhibitions was sent to the Ohio Valley Centennial Exposition in Cincinnati in 1888. Smillie sought examples of photographs and apparatus from individual photographers (both professional and amateur) and commercial manufacturers to illustrate the technical history of the field and contemporary advances. With a broad vision for the newly formed U.S. National Museum (1881), Assistant Secretary G. Brown Goode supported collecting efforts documenting present and past technologies as well as cultural artifacts

from everyday life. Objects for display in 1888 included Samuel F. B. Morse's daguerreotype camera, the first in America; a portrait of Morse, a plate holder, and a fuming box purchased from the National Photographic Association. William Bell and S.R. Seibert donated additional pieces of apparatus for display. Commercial contributors included George Eastman and the Eastman Dry Plate Company, William Kurtz and the Scovill Manufacturing Company.

Following the close of the Cincinnati exhibition, some of photographic items were retained by the Smithsonian as the start of its photography collection. Work on traveling exhibitions and collecting artifacts for a history of photography collection continued over the next decade. Friends to the collection like John Wesley Powell, of the U.S. Geological Survey and later the Smithsonian's Bureau of American Ethnology, and photographer Frances Benjamin Johnston, who apprenticed with Smillie, were influential in bringing significant acquisitions to the growing collection. In 1896, a Section of Photography was recognized within the Division of Graphic Arts, and established as the first unit of its kind in an American public museum. Smillie was given the title of "honorary custodian" of the photography collection while continuing his work as official Smithsonian photographer; he retained both titles through long career. He died in 1917 while still supervising the photography collection.

The 1896 Washington Salon and Photographic Art Exhibition, sponsored by the Camera Club of the Capital Bicycle Club, presented an opportunity to for Goode and Smillie to expand the national collection of photography to include its first examples of the pictorialist, or art photography. Fifty of the 345 works on exhibit at the Washington Salon where purchased for the Smithsonian's new Section of Photography. The selection of platinum and carbon prints represented work of notable photographers such as Philadelphia photographers Alfred Clements, Clarence Moore, and Henry Troth; New York photographer Charles I. Berg; female photographers Mary Bartlett, Sarah Eddy, Emma Fitz, Emma J. Farnwsorth, and Frances Benjamin Johnston; and many amateur photographer members of the Washington Camera Club. Alfred Stieglitz did not submit any of his own photographs to the 1896 Salon but acknowledged the effort of the U.S. National Museum as a step forward in the acceptance of photography as art. Smillie's later correspondence with Stieglitz result in a purchase of twenty-seven photographs from Stieglitz's personal collection of his own work and that of his contemporaries for the installation of the first Smithsonian Hall of Photography in June 1913. The exhibit presented to the visiting public the history of the science, technology and art of photography, select inventors, professional and amateur photographs and equipment, and the beginnings of the motion picture.

Only four men have followed Thomas Smillie as custodians to the unit: Loring Beeson (1917–1920), A.J. Olmsted (1920–1946), Alexander Wedderburn (1946–1960), and Eugene Ostroff (1960–1994). Wedderburn and Ostroff held the title of curator. Important materials accessioned reference the various processes and formats of photography and significant collections of individual photographers William Henry Fox Talbot, J.W. Osborne, Dr. John W. Draper, Peter Neff, Eadweard Muybridge, H.H. Bennett, Frederic Ives, Ansel Adams, Victor Keppler, Richard Avedon, Elliott Erwitt, and Edward Weston. Works by Washington, D.C. photographers are collected, such as Mathew Brady, Alexander Gardner, William Henry Jackson, William Towle, the Bell and Scurlock families, and Fred Maroon. Strengths in the apparatus collection are the U.S. Patent Model collection, stereoscopic cameras and viewers, the GAF collection and still camera collection, the printing and processing collection, and early motion picture apparatus dating from 1895–1915.

More than one hundred years have past since the inception of the Smithsonian's collections pertaining to the history of photography. Now referred to as the Photographic History Collection within the National Museum of American History, the unit's mission focuses primarily on American photography encompassing social history, technical innovation and aesthetic values. Yet, the Collection has maintained a holistic approach to document the history of the field, study the effects of time, and collect best works of both professional and amateur photographers. The Collection has increased to 150,000 photographs and 10,000 pieces of photographic apparatus.

The Smithsonian Institution now administers sixteen museums each with photograph collections pertaining to its holdings. The African Art Museum, Cooper-Hewitt Museum of Design, Freer/Sackler Gallery of Asian Art, Hirshhorn Museum and Sculpture Garden (modern art/international scope), National Museum of American History, National Museum of American Indian, National Museum of Natural History, National Portrait Gallery, Smithsonian American Art Museum, and Smithsonian Archives all offer rich research opportunities in the study of photography.

Michelle Anne Delaney

See also: Smillie, Thomas; Scovill & Adams; Eastman, George; Bell, William; Morse, Samuel Finley Breese; Stieglitz, Alfred; Art Photography; Talbot, William Henry Fox; Draper, John William; Brady, Mathew B.; Gardner, Alexander; Jackson, William Henry; and Stereoscopy.

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SNAPSHOT PHOTOGRAPHY

Before it acquired the photographic meaning with which it is now primarily associated, the word 'snapshot' was originally a hunting or shooting term describing a shot taken quickly, without careful aim or preparation. In 1850, for example, *Blackwood's Edinburgh Magazine* wrote of intrepid African explorers pressing on 'without pausing in their route, even to take a snap-shot at a crocodile basking on a sand-spit' (*Blackwood's Edinburgh Magazine***,** August 1850, 231). During the 1850s, when 'instantaneous' photography first became a technical possibility, the term seems to have first begun to be used in a photographic context. Certainly, by 1859, a report of a demonstration of Thomas Skaife's Pistolgraph camera in *The British Journal of Photography* describes how the camera operator 'was directed to snap his camera at the skylight' *(BJP*, 1 July 1859). In this case, of course, the link with firearms is implicit in the name Skaife chose to give his camera. However, the term was also open to a broader interpretation. The following year, for example, writing in *The Photographic News*, Sir John Herschel referred to 'the possibility of taking a photograph, as it were, by a snap-shot—of securing a picture in a tenth of a second of time' (*The Photographic News*, 11 May 1860). On the basis of this remark, Herschel is usually credited with coining the term 'snapshot' to describe a photograph taken with a very brief exposure. However, it is quite possible, that he was simply echoing what was already current usage.

Herschel's comments, whilst prophetic, did not reflect photography's capability at the time. Although 'instantaneous' photographs were indeed produced during the 1860s—often as stereoscopic pairs—it was not until the introduction of much more sensitive gelatin dry plates in the late 1870s that the practice became widespread. Dry plates not only made possible the pioneering chronophotography of Muybridge, Marey and Anschutz but also profoundly affected the work of amateur photographers by extending greatly the range of subjects available to them. Their introduction also had a radical effect on camera design. For the first time, exposures were now brief enough to allow cameras to be held in the hand when taking a photograph. Freed from the need for a tripod, a new generation of hand-held box-form cameras appeared in the 1880s. Because of their comparatively inconspicuous appearance and speed of operation, which made 'candid' photography possible for the first time, these were popularly known as 'detective' cameras—a term coined by Thomas Bolas in 1881. Most were simple wooden boxes, sometimes covered in leather or brown paper, so as to resemble bags or parcels. Some were disguised as books or watches, hidden in ties, hats or walking sticks or intended to be worn, concealed beneath a waistcoat. Most 'serious' photographers rejected the term 'detective' since they felt that it damaged both their individual reputations and that of photography as a whole. They felt that it encouraged the popular notion of the 'camera fiend' who took people's photographs without their knowledge or consent. Henry Peach Robinson, for one, considered that: 'There is something in the sound of the word so mean, sneaking and unutterably low-down that it quite choked me off having anything to do with the whole concern**'** (*The Amateur Photographer*, 27 March 1896, 270). Robinson's preferred term was the less sensational and more accurate 'hand' camera.

The idea of hidden cameras, of observing without being observed and of being photographed unawares, certainly caught the imagination of the general public. The ubiquitous 'camera fiend' turns up frequently in contemporary cartoons, newspapers and popular magazines. In 1895, *The Amateur Photographer* magazine (founded in 1884 and a manifestation of the rapid growth of photography as a hobby) complained: 'We are gradually beginning to think that when a man gets hold of a hand-camera he loses some of his moral balance, and he does things which otherwise he would not think of doing; and unless he recognises this and pulls himself up short, he degenerates into that worst of all types—the snap-shot fiend' (*The Amateur Photographer*, 19 July 1895, 34). Three years later, when hand cameras were a little less of a novelty, *The British Journal of Photography*, could still write: 'One often hears and reads of the 'hand-camera fiend' who 'snap-shots' (sic) ladies as they emerge from their morning dip at the seaside, or loving couples quietly reading under a shady rock' (*BJP,* 23 December 1898, 818). By the 1890s, then, the term 'snapshot,' whilst still referring to a photograph taken with a brief exposure, had acquired a second and more widely-used meaning as a 'candid' photograph taken without the subject's knowledge or permission. The lure

of covert photography was deemed to be so tempting that even members of reputable clubs and societies had to be warned about succumbing to its attractions. In 1892, a speaker at a meeting of the West Surrey Photographic Society hoped that members of his audience 'would not at any time bring discredit upon hand-camera work by 'snap-shotting' (sic) persons under conditions which might cause unpleasantness' *(BJP*, 11 November 1892, 732). The appropriate choice of subject was not the only cause for concern. The convenience, flexibility, cheapness and comparative ease of use of hand cameras challenged photography's status both as an 'art' and as a 'craft' requiring skill and dedication. As *The Amateur Photographer* observed in 1894: 'The hand-camera has not exercised a most salutary influence on the status of photography; the use of the instrument, the cheapness of some forms too, tending to produce a careless haphazard style of working in which 'flukes' are sure to be occasionally successfu.' (*The Amateur Photographer*, 5 January 1894). Alfred Stieglitz, despite being an early advocate of the hand-camera as a creative tool, concurred: 'The placing in the hands of the general public a means of making pictures with but little labor and requiring less knowledge has of necessity been followed by the production of millions of photographs. It is due to this fatal facility that photography as a picture-making medium has fallen into disrepute' (*Scribner's Magazine*, November 1899, quoted in Nickel, Snapshots, 11). Indeed, since snapshots are usually taken by people with little or no technical knowledge or aesthetic sensibility—with predictable results—the word has also acquired a pejorative association. This seems to be a comparatively recent interpretation. Paul Martin, for example, usually described his photographs as 'snapshots' or even 'snaps' and even called his 1939 autobiography *Victorian Snapshots*.

Confused and threatened by such rapid change, some photographers looked back at what they perceived as a lost 'golden age': 'In the good old time of collodion and silver baths, amateur photographers were comparatively few, and they were looked up to by their friends as being far above ordinary mortals, owing to their knowledge of the black art…They had to do all the work themselves…and felt rewarded for all their trouble by their intense pride in the result. Now, alas! All that is changed, the amateur photographer is everywhere; he knows nothing of the troubles of his predecessors and has no respect for the old amateur…who often finds that he has to take a back seat to make room for the man who, only last week, bought a 'complete outfit' for a guinea, 'directions for use' included' (*BJP Almanac*, 1890,p446). Some die-hard conservatives refused to compromise. Colonel Joseph Gale, for example, when asked whether he would consider doing some hand-camera work, replied, 'I have not descended to level yet.' (*The Photographic Journal*, July 1934, 345). Others, however, such as Paul Martin, actively embraced the new and exciting possibilities offered by the dry plate and hand-camera, capturing the world of the 1890s with his trusty 'Facile' camera, tucked under his arm. Discovering the delights of candid photography, he later enthused, 'It is impossible to describe the thrill which taking the first snap without being noticed gave one' (Paul Martin, *Victorian Snapshots*, 22). George Davison, who as well as being a leading pictorial photographer was also a director and assistant manager of the Eastman Photographic materials Company, managed to persuade several of his photographic friends, including Eustace Calland, J. Craig Annan and Frank Meadow Sutcliffe, to try out Kodak rollfilm cameras so that the results could be used for advertising or promotion. In 1897, in another initiative to promote the legitimacy of the hand-camera, Davison organised the first public exhibition of snapshot photography. As well as amateur work received as entries for an international competition, the exhibition also included an invitation section of work by leading pictorial photographers and a selection of work by Royal photographers, including Princess Alexandra. The exhibition was a great success and after its three-week run at the New Gallery in London's Regent Street transferred to the National Academy of Design in New York.

The success of the Eastman Exhibition was a measure of the extent to which snapshot photography had caught the interest of the public. Whilst the debate about snapshot photography rumbled on in the photographic press and in club and society meetings, the public had, it seemed, already made up its mind, knowing little and caring even less about the opinions of the likes of Colonel Gale or Alfred Stieglitz. Events had conspired to overtake matters. For in the wider world a revolution was taking place. A revolution that was to fundamentally alter the nature of amateur photography; A revolution that had been triggered in 1888 by the appearance of a 'detective' camera named *The Kodak*.

Marketed with the famous slogan 'You press the button, we do the rest,' the Kodak was simple enough for anyone to use. Eastman claimed: 'We furnish anybody, man, woman or child, who has sufficient intelligence to point a box straight and press a button…with an instrument which altogether removes from the practice of photography the necessity for exceptional facilities, or in fact any special knowledge of the art. Significantly, the camera formed merely part of a complete system of amateur photography that was to revolutionise photography. The Kodak camera was pre-loaded with film. After this had been exposed, the entire camera was returned to the factory for the film to be developed and

printed. The camera, reloaded with fresh film, was then returned to its owner with their negatives and a set of prints. For the first time, the act of picture-*taking* was separated from that of picture-*making.* Contemporary observers soon realised the significance of the Kodak System. Reviewing the Kodak, *Scientific American* magazine concluded that 'it promises to make the art of photography well nigh universal.' Ironically, of course, in making photography universal it also directly challenged its claim to be regarded as an 'art.' How could such a democratic and quotidian medium whose subjects were largely drawn from the trivial and banal have any pretensions towards 'Art'?

Crucially, the Kodak was not aimed at existing photographers but at a vast new untapped market that Eastman had created for photography. As *The Photographic News* was quick to realise: 'The Kodak is intended…to bring into the ranks a new class—those who do not wish to devote the time and attention which is necessary to really practice photography, but who desire to obtain records of a tour, or to obtain views for other purposes' (*The Photographic News*, 14 September 1888, 578). Eastman's own advertising copy put it more succinctly—'Anybody can use it. Everybody will use it.' With cameras placed in the hands of people who were not perceived to be 'photographers,' the word snapshot took on its third and current definition, meaning a photograph taken by an unsophisticated amateur, using a simple camera. Today, it is the intent of the photographer rather than the exposure time or choice of subject that best serves to define the snapshot. Whilst the majority of snapshots are taken with comparatively brief exposures, some are not. Moreover, whilst the word also implies a degree of spontaneity, many snapshots are the result of considerable preparation and arrangement of the subject. The fundamental characteristic of the snapshot is that it is a 'naïve' document motivated solely by a personal desire to create a photographic record of a person, place, or event with no artistic pretensions or commercial considerations.

Following the success of the Kodak, the rapid introduction of ever-cheaper camera models, culminating in Eastman's introduction of the Brownie camera in 1900, removed many of the financial as well as the technical constraints that had delayed the popularization of photography. For the first time, photography became truly accessible to millions of people. In 1896, even before the appearance of the Brownie, the writer, J. Ashby Sterry, wrote about 'these days of the universal Kodak and perpetual snap-shooter' (J. Ashby Sterry, *A Tale of The Thames*, 1896). In 1899, *The New Penny Magazine* in an article entitled 'Snap-Shot Photography' could confidently claim that 'Almost everyone now has some idea of the taking and making of a photographic picture' (*The New Penny Magazine*, 1899, 282). The snapshot had come of age.

Colin Harding

See also: Davison, George; Eastman, George; Herschel, Sir John Frederick William; Kodak; Camera Design: 5 Portable Hand Cameras (1880–1900); Camera Design: 6 Kodak, (1888–1900); and Instantaneous Photography.

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SNELLING, HENRY HUNT (1817–1897)

The History and Practice of the Art of Photography, published in 1849, was the first book from the pen of Henry Hunt Snelling, who would go on to establish, edit, and publish the influential *Photographic Art Journal* in 1851.

A writer, editor and photographer, Snelling was born in Plattsburg, New York, on November 8, 1817, where his father, a colonel in the US Army, was stationed. He spent much of his childhood travelling to new postings with his parents, eventually settling in Detroit with his mother in 1829 after his father's death.

After a number of generally unsuccessful business ventures, Snelling, in 1847, took up a position with Edward Anthony, then the major manufacturer and supplier of photographic materials, equipment and accessories. Questions about technique from customers reputedly encouraged Snelling to believe that there was a market for instruction manuals, and *The History and Practice of the Art of Photography* appeared within two years.

It was, however, the monthly publication of *The Photographic Art Journal*, renamed in 1854 *The Photographic and Fine Art Journal*, which established Snelling as perhaps the most authoritative voice on the development of American photography at the time. Two further books, *A Dictionary of the Photographic Art* (1854), and *a Guide to the Whole Art of Photography* (1858) further cemented his reputation.

John Hannavy

SOCIÉTÉ FRANÇAISE DE PHOTOGRAPHIE (SFP)

French organization, 1854 to present

The Société française de photographie (SFP) was founded November 15, 1854, by seventeen former members of the Société heliographique (SH) (1851–53) and a number of prominent figures in the sciences, the arts, government, and society—non-photographers as well as practitioners. The character of the earlier Société heliographique, a rather relaxed, genteel group with meeting rooms in the home of its president, Colonel de Montfort, intimate photographic soirees in private homes, and a self-described identity as an organization for "those looking in their leisure time for the charm of a noble interest and the attraction of an elevated preoccupation" (Janis 1983, 42) was that of an exclusive group of enlightened amateurs. The SFP adopted a more formal structure appropriate to a learned society organized on the model of the French Academies. The precise connections between the earlier organization and the SFP have yet to be traced. Although many former SH members became members of the SFP, the SFP was not a continuation of the earlier organization. In fact, prominent members of the earlier group are notable in their absence, for example, Henri LeSecq and Ernest Lacan, while others, such as Eduard Baldus only joined later.

The Société française de photographie defined itself under its organizing statutes as "an artistic and scientific association of men studying photography." Membership was limited and exclusive. By charter there would be two hundred regular members, and an additional two hundred corresponding members from outside Paris; a membership number no doubt based on the model of the two hundred member Institut de France. Ten of the founding members of the SFP were members of the Institut de France, including the first president Victor Regnault. They also counted among their founders, members of the nobility, i.e., Count Aguado, Baron Gros, and Baron Humbert de Molard. Included among the ninety-three founders were representatives from the arts—Eugène Delacroix, Vallou de Villeneuve, Louis Robert, Eugène Durieu and Eugène Cuvelier—and sciences—the botanist Brébisson, naturalists Geoffrey-Saint-Hilaire and Louis Rousseau, and physicist Léon Foucault. Several members came from the mid and upper ranks of the Second Empire bureaucracy. And, of course, a number of photographers associated with the Société Heliographique—Hippolyte Bayard, Gustave LeGray, Charles Nègre, Blanquart-Evrard, Léon de Laborde—were also founding members. Victor Regnault, a physical chemist, director of the Imperial Porcelain Manufactury at Sèvres, and a photographer, served as the SFP's first president, a position he held until 1868. By 1855 membership had grown to 165 members. The aspirations of the organization were defined in the first issue of the *Bulletin de Société Français de Photographie* (January 1855) which explicitly denied "any consideration foreign to purely scientific and artistic goal[s]…[other than] the pure love of the photographic art and science" (McCauley 1994, 41). McCauley identified a strong anti-commercial bias in the membership and program of the SFP and notes that during a period characterized by the explosion of commercial photography studios and the firms serving them (1850–1870), relatively few commercial operators were to be found in its membership rolls.

The SFP's administrative committee comprising fifteen members and officers organized regular bimonthly meetings which were conducted under formal rules of order like those governing the Academies. Committees were established to investigate reports, review scientific submissions—generally to do with innovations in processes and equipment—and to vet technical communiqués. Meetings and the work of the committees were reported in the *Bulletin de Société Français de Photographie,* which also announced competitions, almost exclusively of a scientific or technical nature, and published the prize-winning submissions. The secretary carried on lengthy correspondence with a number of foreign photographic societies excerpts of which appeared in the *Bulletin*. The *Bulletin* quickly settled into a dual role as the means of communicating the work of the SFP and its members, and a journal devoted to the scientific and technical aspects of photography. Issues that might have been of interest to commercial photographers—laws governing photographic rights, or advances specifically geared to commercial interests in the rapidly industrializing practice of photography—were not addressed. It was no doubt due to the lack of support for commercial interests that in 1859 Ernest Mayer, of the firm Mayer frères et Pierson, founded the Union photographique as a mutual aid society for photographic workers.

Within months of its founding, the SFP began to organize photographic exhibitions; the first opened in September 1855 and coincided with the Paris Universal Exposition which featured a remarkably strong showing of photographic work. Between 1855 and 1876, the SFP organized eleven photographic exhibitions—1857, 1859, 1861, 1863, 1864, 1865, 1869, 1870, 1874, and 1876—a continuous program of exhibitions which roughly coincided with the Paris painting salons. Exhibitions were open to members and non-members, and to foreigner practitioners. The SFP's exhibitions quickly achieved the status of the photographic salon on the order of the official paintings salons. The 1859 SFP exhibition was held in the Palais des Champs-Elysées in rooms adjacent to the Salon, the government sponsored

painting exhibition. Subsequent exhibitions opened on the same day as the *Salons,* which rejected all submissions in photography. The Société's exhibition committee also organized French representation in exhibitions in other countries. SFP members exhibited as a group in Brussels in 1856, in a large space dedicated to French photographic achievement. This was also the case in reciprocal arrangements the SFP entered into with the Royal Photographic Society (RPS) of England; in the RPS exhibitions of 1858 and 1863, SFP members were accorded their own section or rooms.

By far the most press recognition and critical attention accorded to photography was directed to the exhibitions of the SFP. With the exception of the 1855 exhibition, every later exhibition was accompanied by a catalogue which listed photographers by name and nationality, described the subject of submitted images, and identified both negative and print processes. They constitute an invaluable resource for researchers. In addition, the *Bulletin* devoted extensive coverage and detailed reviews to all of the SFP exhibitions, as well as the photography sections of the Universal Expositions of 1855 and 1867, and international exhibitions of photography in Brussels, London, Edinburgh, etc.

The scientific focus came to dominate the SFP to the exclusion of the arts towards the end of the nineteenth century. Within the *Bulletin* there are fewer references to artistic projects by members; discussions of issues of aesthetics, never prominent, disappear. The criteria for evaluating work presented in the SFP exhibitions increasingly focused on technical competence. As the nineteenth century drew to a close, the SFP came more and more to function as a scientific academy in which scientific and technical issues could be presented and debated, and as a repository for technical examples. Prizes for technical innovation were offered under the aegis of the Société and a number of technical challenges were posed by the Société with awards determined by committees made up of members with scientific backgrounds. This insured that important innovations were presented first to the SFP for publication in the *Bulletin.* Scientific and technical submissions ranged from that of Edmund Becquerel, a founding member, who published the results of his experiments with heliochromy, or recording the colors of the light spectrum on daguerreotype plates, to Alphonse Poitevin's presentation of a photolithographic printing process. But the SFP's preoccupation with scientific and technical questions created an increasing sense of disenfranchisement for members who aspired to artistic photographic practice. Ultimately, although some maintained membership in what was clearly the most prestigious photographic organization in France, they and others formed organizations that reflected more closely their interests. Such an organization was the Photo-Club de Paris, founded in 1894 by SFP member Robert Demachy and others, to address the interests of artistic photographers. The Photo-Club's first exhibition (1895) was titled the First Exhibition of Photographic Art, a rather heavy-handed effort to distinguish their program from the exhibitions of the SFP. This division of artistic practice from the overwhelmingly scientific and technical bent of photographic organizations, such as the SFP, was echoed by similar organizations in London—Linked Ring Brotherhood—and Vienna—Das Kleeblatt (The Clover Leaf)—and New York—The Photo-Secession.

Société française de photographie continues to this day as a research center. Their holdings include superb collections of images—contemporary and historic, examples of rare photographic processes and types of equipment, as well as members' archives which include papers and photographic prints and negatives. The Société maintains a library devoted to historic and contemporary photography. In 2006, they list their holdings at 10,000 books and five hundred photographic journals from twenty-four countries. This includes extensive holdings of early photographic journals from around the world. The collection of early photographs can be counted among the most important of French photographic collections. Publication of the *Bulletin* continues, and is joined by a journal devoted to historical and critical research, *Études photographique.* The SFP continues to promote the study of photography—both its history and contemporary use—through lectures and its collection.

Société française de photographie (www.sfp.photographie.com), 71, rue de Richelieu, 75005 Paris, France.

KATHLEEN STEWART HOWE

See also: Société héliographique

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SOCIÉTÉ HÉLIOGRAPHIQUE

In the early stages of the history of photography, many people were experimenting with the new medium. The calotype process, which is a paper negative process, was one of the most important techniques of the time.

In 1851, a group of artists, writers, and photographers got together and formed the first photographic society in the world: the Société héliographique française. The creation of this photographic society was a landmark moment in the evolution of photography and important for its history. It was a network of people excited about the possibilities of the calotype and interested in exchanging both chemical and artistic skills, which contributed to the expansion and development of photography through exhibitions, members' projects such as La Mission Héliographique, and the review, *La Lumière*.

The 1850s was a time when many different groups were being established and efforts were being made to legitimize the new medium. The objective of the society was to unite those involved in the new process and to exchange ideas. The Société héliographique was an important development for the growth and recognition of photography because it promoted the medium.

The society was formed by Baron de Montfort in January of 1851 in Paris, France and its first president was Baron Gros, a diplomat and photographer. The group was made up of mostly photographers, amateur and advanced, as well as painters, writers, scholars, and public figures. The society's board included Hippolyte Bayard, Edmond Becquerel, Benjamin Delessert, Eugène Durieu, Mestral, Léon de Laborde, Claude-Marie-François Niépce of Saint-Victor, Jules-Claude Ziegler and Baron de Montfort himself. Many of master photographer Gustave Le Gray's students, as well as students of painter Eugène Delacroix's, were members; both of these artists were also members. Additional members included Olympe Aguado, Arnoux, Aussandon, Edouard Baldus, Barre, Champfleury, Charles Chevalier, Cousin, Desmaisons, Fortier, Count of Hassounville, Horeau, Lemaître, Henri Le Secq, Noël-Marie-Paymal Lerebours, Leisse, Frédéric Bourgeois de Mercey, Montesquiou, Prince of Montléart, Emile Peccarère, Viscount Adolphe of Poncéau, Peuch, Puille, Victor Regnault, Schlumberger, FrançoisAuguste Renard, Viscount Joseph Vigier and Francis Wey.

The headquarters of the society was at Baron de Montfort's home, 15 rue de l'Arcade in Paris. The top floor of the building contained meeting rooms as well as rooms closed off for developing and experimenting in the new medium and an outside terrace for members' use. The building also had a shop, owned by Mr. Peuch, which sold photographic materials.

Members were united with a common cause which was to endorse photography through exhibitions, share technical information, publish reviews and more. They met frequently to work on developing the technique. Lengthy discussions took place and served as a way to pass along skills and knowledge of the technique. Beyond the regular informal get-togethers, the society had "photography soirées" at the Baron de Montfort's home or at other members' homes.

The society also held exhibitions, notably an opening exhibition in January of 1851 as well as an exhibition which included a portfolio "intended to illustrate the best French photography" by Charles Nègre titled *Little Ragpicker* (Pare, 228). The society also assembled a collection of photographs in the form of albums.

The weekly magazine, *La Lumière*, was a significant part of the society and prospered even after the society ended. Under the direction of both Francis Wey, who served as head of the society for part of its existence, and Ernest Lacan, *La Lumière* reviewed exhibitions as well as members' work and even recorded the society's meetings. While reporting on photographic projects of the time, *La Lumière* expressed the great enthusiasm for the medium that the members shared in the Société héliographique. The magazine existed from 1851 to 1860 and remains a very important document for the medium's history of the time period, and certainly for the history of the Société héliographique.

Since the 1850s was an important time for the advancement of photography, the Société héliographique played an important role in its progress. For example, five members of the society—Gustave Le Gray, Mestral, Édouard Baldus, Hippolyte Bayard and Henri Le Secq—became the group that formed the Mission Héliographique, commissioned by the government's Commission of Historical Monuments. One of the leading members of the Commission, Léon de Laborde, was also a member of the Société héliographique. The mission's goal was to send these five photographers across France to document important French architectural structures. This effort, a large proportion of which was produced by using le Gray's waxed paper process, was an attempt to record French cultural heritage and began shortly after the foundation of the Société héliographique. *La Lumière* reported with great fervor and praise for the project.

British photographer, Roger Fenton who had studied in Paris under painter Delaroche from 1841–1843, went back to France in 1851 to study the structure and organization of the newly created Société héliographique. The following year he drafted a proposal for a photographic society back in Britain and eventually founded the London Photographic Society in 1853.

The Société héliographique française dissolved in 1854 and became the Société française de photographie which still exists today. As for the end of this group, photography historian Michel Frizot explains in "Calotypists circles," that "this "secession" may be related to the change in technique from paper to glass negatives and the need for better organization of meetings, which remained informal and friendly" (*A New History of Photography*, Frizot, 70). The group was informal

but then as the medium became more complex, it was necessary for a more disciplined approach to exploring its complexities. The Société héliographique published reviews, held discussions and exhibitions related to promoting the technique, and served as a model for future organizations. The society still remains an important step in the evolution of the photographic medium.

KRISTEN GRESH

See also: Calotype and Talbotype; Société héliographique Française*; La Lumière;* Mission Héliographique; Montfort, Benito de; Gros, Baron Jean-Baptiste Louis; Bayard, Hippolyte; Becquerel, Edmond Alexandre; Delessert, Edouard and Benjamin; Durieu, Jean-Louis-Marie-Eugène; Mestral, Auguste; de Laborde, Henri; Niépce de Saint-Victor, Claude Félix Abel ; Ziegler, Jules; Le Gray, Gustave; Delacroix, Ferdinand Victor Eugène; Wey, Francis; Le Secq, Henri; and Fenton, Roger.

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SOCIETIES, GROUPS, INSTITUTIONS, AND EXHIBITIONS IN ASIA (EXCLUDING INDIA)

The photographical technique was a blend of various inventions stemming from diverse origins. Soon after its first public circulation in August 1839, photography freely entered the commercial field. The ability, open to everyone, to daguerreotype was the key to success. Photography then spread through Europe, America and few years later throughout the world. The spread of photography in Asia, as elsewhere, does not only come from the novelty of the process. It also benefited from the commercial expansion of western countries through eastbound sea routes and first appears in Asia in coastal towns open o foreign trade.

Photography also reached the orient with the various diplomatic or military expeditions, as they often included an amateur or a professional photographer.

Soon, many adventurers, attracted by the chance of fortune, would try to establish photographic studios in Asia. Singapore—first trading post in 1819, then crown colony in 1867—had its first documented photographer in 1843. The economic growth of the colony attracted many studios such as August Sachtler, 1863, and G.R. Lambert & Co, 1867. The enthusiasm of the foreign community both drew new photographers to Singapore and urged them to get organized. The first official society was the Strait Photographic Association, created in 1887 at Hill Street. The first president was D.C. Neave, founder o the F&N Company. As soon as 1894, members of this association took part in international photographic competitions and won prizes in Jakarta.

In the same period, China was compelled to open Canton (Guangzhou), Amoy (Xiamen), Foochow (Fuzhou), Ningpo (Ningbo), and Shanghai to foreign trade and cede Hong Kong, following the signature of the Treaty of Nanking on 29 August 1842. It allowed British merchants to establish "spheres of influence" in and around the ports and permitted the installation of occidental newcomers (merchants, soldiers, traders, diplomats, adventurers etc.) and with them along came photography. Jules Itier took the first documented daguerreotypes of Macau and Canton in 1844. He was a member of the French embassy of Théodose de Lagrenée, who signed the treaty of Whampoa (24 October 1844) between France and China.

The arrival of photography depended on the opening to foreign trade of the coastal owns of southern China. However the first photographers society was founded only in 1937, it was The Photographic Society of Hong Kong. It also followed the route of military expeditions, as the armies took photographers along. Felice Beato would go further in land in 1860, taking pictures in the trail of the Anglo-French force, which invaded Peking and burnt the famous Summer Palace.

Photography reached Japan in much the same way. From 1853 onward, Japan, closed to all foreign trade since 1639, started to open its ports under the pressure of western countries. Ports as Yokohama, Nagasaki, or Kobe were then open to westerners. The first known daguerreotype of Japan dates from 1857, but professional studios appear only a few years later. Charles Wirgman, sent to Japan as a correspondent of *The Illustrated London News* as soon as 1861, invited Felice Beato to join him in 1863. Together, they founded in 1865 their first commercial venture, a studio in Yokohama. It is significant that when the second owners of this firm were still westerners, Stillfried & Andersen, the next one was a Japanese, Kusakabe Kimbei.

The further improvement of photographical techniques increasingly mastered by Japanese would foster amateur practice. The first society, the Nihon Shashinkai was created in 1889 by William Burton, a professor at Tokyo's imperial university, Ogawa Kazumasa, and other native and foreign photographers. Ogawa's friend, Japanese Viscount N. Okabe was an amateur

photographer too and through his wealth and position could help the development of photography in Japan. As a president of this society Enomoto Takeaki, an influent member of the Meiji government, tried to promote photography as an artistic medium. Other photographic societies emerged at the turn of the century, such as the Tokyo Shayu –kai, founded by Osaki Koyo, or the Toyo Shashin-kai, by Miyauchi Kotaro.

In south-east Asia, the lead of Thaïland in the adoption of photography must be noted. It is due first and foremost to the implication of King Rama IV. The king created a royal department of photography in his government and had the queen and himself portrayed. The French bishop Pallegoix, leader of Siam's Catholic Church, introduced daguerreotype a mere few years after its invention. According to a 1905 edition of the Sayam Prabhet newspaper, the country's first native photographers were Pallegoix's students, Phraya Kasapkijkosol, Phra Preechakolkarn and Luang Akaneenaruemitr, who is best known today as Chit Chitrakanee or Francis Chit.

In other parts of south-east Asia, the British colonial administration sent various archeological or artistic surveys, often with a photographer, such as the one sent to Burma in 1855 to document the ancient town of Ava.

Photographers reached Indochina and other French colonies or protectorates following the progression of troops in Cochinchina. Emile Gsell was the first to settle in Saigon and have his studio there from 1866 to 1879. The progression of the troops in the north—Annam and Tonkin—allowed photography there too. Hocquart, a military doctor, illustrated through his photographs the progress of French colonization. But no real organization dedicated to photography was established before the beginnings of twentieth century. The EFEO—French school of far-eastern studies—established in Hanoi in 1900, was the first body to launch extensive photographic campaigns.

Documentation about societies, groups and exhibitions of photography in far-east Asia is very scarce and few historians have so far had either the ability or the will to search through the subject. The broad outline as it appears today is that of a parallel progression of photography, trade, military conquests, religious missions and industry. The countries where a strong political system, and the social elites, were willing to adopt the new technologies brought from the west, such as Siam and Japan, were the ones where amateur and professional photographers first got organized in societies or government bodies. Many foreigners were also probably members of photographic societies in their home countries. Elsewhere the societies seem to appear only in the twentieth century. It is likely that the exhibitions or fairs dedicated to industry and trade also played a role in the diffusion of photography but they are yet to be studied. It would be interesting to compare the case of far-east Asia to that of India, where photography rose fast and strong in the nineteenth century.

JÉRÔME GHESQUIÈRE

See also: Lambert & Co., G.R.; Beato, Felice; von Stillfried und Ratenitz, Baron Raimund; Chit, Francis; and Gsell, Emile.

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SOCIETIES, GROUPS, INSTITUTIONS, AND EXHIBITIONS IN AUSTRALASIA (INCLUDING NEW ZEALAND AND PACIFIC)

Nineteenth-century Immigrants from Great Britain who chose to settle in Australasia may have been surprised to find that once they'd settled into their new homes, they had on their doorstep some refinements which hitherto may have been denied them because of their status in society. These were learned institutions which went under a multiplicity of names like the Philosophical Society or the Mechanics Institute. Some of these may have been fostered by those who were responsible for organising their passage in the first place. For instance, the New Zealand Company, largely responsible for the settlement of Port Nicholson, saw to it that a consignment of books was dispatched to the colony. For an annual membership fee, immigrants could join these groups and participate in the exchange of information on a myriad of topics, especially the arts and sciences.

Wellingtonians for instance, were able to boast a Mechanics Institute in a temporary dwelling which was purchased for £30 in 1842, barely two years after the settlement was established. This housed a library and a selection of (unspecified) scientific instruments which had been purchased in London prior to the departure of the first immigrant ships that left England in September 1839.

Institutions like this became a conduit which saw the dissemination of knowledge including the virtues of the daguerreotype and other photographic improvements which followed at a rapid pace. It may come as a surprise to known that Australians and New Zealanders were more than familiar with the theoretical workings of the daguerreotype and the calotype well before a decade had elapsed after their discovery. Wellington's Mechanics Institute represents just one of many fledgling institutions that developed throughout Australasia.

Of course anyone involved in the arts and sciences in mid-Victorian times was eagerly sought to give ad-

dresses to its members. In August 1848, the daguerreotypist H.B. Sealey was invited to become a member of the Mechanics Executive Committee after he had presented an address on the daguerreotype.

Elsewhere in the South Pacific, with smaller centres of population, it would be difficult to maintain anything approaching a society or an institution.

However, as missionaries were very active with cameras, it may have occasioned an instance whereby one of their party may have given a talk or demonstration of their skills. Their audience may have included land owners, government employees and traders. For instance, the French settlement in New Caledonia saw a number of photographers from 1848.

After the discovery of gold in payable quantities, some cities like Melbourne in Australia and Dunedin in New Zealand's South Island, demonstrated their wealth with trade exhibitions. These colonial events attempted to follow that which had been established in London in 1851 with The Great Exhibition. They were ideal platforms for displaying photographs and elicited great attention whenever they were staged. Dunedins' first exhibition was in 1865 and it was repeated again in 1889/90, when it carried the more impressive title of title of the New Zealand and South Seas Exhibition.

Gradually, as some of the wrinkles were removed from photography an ever growing number of educated people began to take up the craft as a recreational pursuit. Some of these amateurs formed themselves temporarily into groups like those who met on 8 December 1858 in Sydney under the auspices of the Philosophical Society of New South Wales.

This may well have been the first such group in Australasia. As amateurs tended to push the boundaries of photography, there eventually came a need to show their handiwork to a wider audience. The amateur photographer Rev. John Kinder (1819–1903) exhibited a selection of his photographic views at two exhibitions run by the Auckland Society of Arts in 1870 and again in 1873. Despite these developments, photographers in Australasia had to wait many years before anything resembling a photographic society of some significance got off the ground.

In New Zealand the first photographic organisation to appear on the scene was the Amateur Photographic Association of 1882, which met on a monthly basis and had its base in Wellington. A prominent member of this Association was Arthur Thomas Bothamley (1836–1948), a civil servant who played an important role in New Zealand's exhibit at the 1876 International Exhibition in Philadelphia. Also active about this time in the Association was an amateur who went on to become a member of the New Zealand's Parliament, William Thomas Locke Travers (1819–1903). In 1871, Travers read an important paper to the Wellington Philosophical Society on "Out-door photography," a report which drew attention to some photographic characteristics peculiar to this part of the world, like the effect of ultra violet light on photographic emulsions which had been devised mainly for use in the northern hemispheres.

The 1890s witnessed a period of tremendous expansion as easy-to-use cameras of all description became available at low cost. Photographic clubs and societies were formed in nearly every major settlement. A highlight in their annual calendar of events was the Intercolonial Exhibitions which saw entries from both sides of the Tasman Sea gathered together where they were judged and awarded medals and certificates.

Attempting to bond these widely spread groups into a united front fell unwittingly into the lap of several publications which were established in the early 1890s. Two of these were Australian journals. They were *Harrington¹s Photographic Journal* which, though printed in Australia, was also released in New Zealand. It was founded in 1892. Similarly, the Australian Photographic Review also found its way across the Tasmanfrom 1894. In New Zealand, *Sharland's New Zealand Photographer*, also commenced publication in 1892. This was edited by Josiah Martin, (1843–1916) a commercial photographer who amongst other things opposed soft focus photography and actively campaigned for a number of matters which identified injustices to photographers when it came to government agencies who were undercutting professionals who were involved in supplying prints for the lucrative tourist market.

As the nineteenth century came to a close, New Zealand photographers were able to measure themselves for the first time against their overseas counterparts. A British annual called *Photograms of the Year*, which published a yearly survey of fine art prints from around the world, despatched a folio which included examples by H.P. Robinson. These were toured in Australasia by photographic clubs and societies in 1896.

William Main

See also: Daguerreotype; and Photograms of the Year (1888–1961).

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SOCIETIES, GROUPS, INSTITUTIONS, AND EXHIBITIONS IN AUSTRIA

Among the most important places and proliferation of early photography in Austria is Physikinstitut der Wiener Universität, das Polytechnische Institut in Wien (1815 an engineer created academy, which is called today the University of Vienna) and the Niederösterreichische Tradesman's Union (which was a 1839 union of the industrial middle class with financial support from Viennese aristocracy circles, and is known today as the Austrian Tradesman's Union). Andreas von Ettingshausen was chair of physics at the Viennese university since 1834, and was a reader of the publication of the Daguerreotype in Paris 1839. Von Ettingshausen and his nephew William Burger gave lectures on photography between 1863 and 1867. From 1896 to 1930 these types of lectures were given by the photographer Hugo Hinterberger who specialized in photomicrographs. Johann Joseph Prechtl (supervisor from 1815, and until 1849 was the director of the school) and the chemists Anton von Schroetter and Joseph Johann Pohl were the main figures responsible for supporting photography at the polytechnic institute. On Prechtls suggestion Anton George Martin (initially an assistant at physical Institut, starting from 1843 as the librarian of the polytechnic institute) and the others began to experiment with photography.

Under Anton of Schroetter general guidance, the school's own Chemistry institute developed a laboratory equal to that of several photographic pioneers, under the direction of Andreas Groll and Johann Natterer, and particularly Joseph Johann Pohl, who became coworkers of Anton George Martin in 1846. He also, in 1858, gave relevant lectures on photography and micro photography at the polytechnic institute and became a professor of chemical technology (1862–1895) and later a teacher of Josef Maria Eder.

Among other famous photographers was Wilhelm Horn, who before he opened his studio in Prague in 1841, was the publisher of the first photographic technical periodical in German-speaking countries (photographic journal) from 1854 to 1865, and the founder of the first Central European photography wholesale business.

Andreas von Ettingshausen, Johann and his brother Joseph Natterer, and August Artaria were considerable representatives of the Niederoesterreichi Tradesman's Union who represented Simon Ploessl and Wenzel Prokesch, the art dealer and publisher. The association secretary, William Horn, who had been in this postion since 1841, traveled to Paris to establish an exchange between Austrian and French photographers and was a general manager of the world exhibition of 1873 in Vienna. From the Niederoesterreichi Tradesman's Union, various initiatives proceeded for the establishment of public technological-historical collections after 1873 in addition to the efforts started in 1908 of the establishment of the Gründung des Technischen Museums Wien, which opened in 1918. In its exhibition contents among other things, valuable photographic historical pieces from the collection of the poly-technical institute were displayed.

The earliest association which centered on the application of photography in Austria has traditionally been the Fürstenhofrunde, which existed from 1840 to 1842. At first this organization was more informally a club of photographic pioneers consisting of Josef Berres, Anton George Martin, Josef Maximilian Petzval, Joseph Johann Pohl, Wenzel Prokesch, Peter Wilhelm Friedrich von Voigtländer, and August Artaria, which met at the Naturwissenschaftlern, Technikern und Medizinern, Künstlern und Gewerbetreibenden zusammengesetzter Klub von Fotopionieren. They also met at the house of the painter Carl Schuh zu Fachgesprächen or in the building of the Fürstenhofs in Vienna to discuss common experiments. The testing of Petval's revolutionary lens design of 1840 is probably the group's most significant experiment.

An outstanding instance of the early paper photography in Austria embodied the photographic studio of K.K. Hof and the state of printing, which increased in 1841 under the direction of Alois Auer who was the director until 1866. In the 1850s and 1860s one of the best innovations created were the print manufacturing plants of Europe. Many aspects of public research and development focused on visual presentation because these plants were able to produce large sized architecture and panorama photographs, expedition reports, photomicrographs and first photo-mechanical pressures through unusually systematic and effective production lines, allowed the variety of reproduction methods and picture documentation to be widely distributed with relative ease and conformity.

Legal restrictions concerning copyrights were introduced to Austria in 1861, which led to the establishment of a photographic copyright association. The photographic society in Vienna remains today the oldest and most long-lived interest agency of photography in German-speaking countries. This association at first was

Antoine, Franz. Hermine Antoine. *The Metropolitan Museum of Art, David Hunter McAlpin Fund, 1948 (48.83.21) Image © The Metropolitan Museum of Art.*

mainly modelled after the Société française de photographie, however the state-conformed civil organization nevertheless was somewhat dominated by the same stucture existing in the country's government.

The first president of the society however was Anton George Martin (elected in 1861 until 1865, then again from 1868 to 1870). He was followed by the chemist and school teacher Emil Horing (president 1866 to 1867 and 1870 to 1883) and the officer and reproduction technician Ottomar of Volkmer (president 1885–1901). Furthermore among the group's members were Ludwig Angerer, Rudolf Eitelberger, Josef Maximilian Petzval, Joseph Johann Pohl, Ludwig Schrank, Anton von Schroetter and Wilhelm Schwarz-Senborn. The society pursued commercial goals and offered advertisements in their association magazine *Photographische Correspondenz* (from 1864 to 1971 since from 1956, the official scientific organ came from the Sektion der Deutschen Gesellschaft für Photographie in Cologne) however, *Photographische Correspondenz* was always also a current, supraregional and effective forum for the broader proclamations of scientific-technological innovations. In addition it was prominent in the organization of exhibitions in 1864, in Vienna as the first specialized photographic exhibition in German-language countries. This exhibition provided a historical sample and apparatus collection as well as a library of relevant international specialized publications, recently located at Graphischen Lehr- und Versuchsanstalt but today, on loan to the Fotosammlung der Albertina in Vienna). The purpose of Österreichischern Museums für Kunst und Industrie (1864 opened; first director: Rudolf Eitelberger) was to provide a platform for central discussions reagrding modern visual culture, similarly fashioned after that of the larger model of the South Kensington Museum. The integration of photography into this discussion was helped along through the establishment of the museum's own photographic studio, led by the renowned photographer Ludwig Angerer. Further support of photography within the museum included comprehensive photograhic exhibitions, one of which took place in 1871 and was called grafische, reproduktionstechnische und fotografische Sektion im Rahmen der Eröffnungsausstellung im Museumsneubau am Wiener Stubenring; then in 1875 consisting of the internationale Ausstellung der Photographischen

Gesellschaft; and in 1888 with erste Ausstellung des Clubs der Amateur-Photographen in Wien, and again in 1891 with the Club der Amateur-Photographen in Wien—Internationale Ausstellung künstlerischer Photographien.

The opening of Eröffnung der K.K. Lehr and Versuchsanstalt für Photographie und Reproductionsverfahren in Vienna, today Höhere Graphische Bundes-Lehr- und Versuchsanstalt (GLV) was in 1888. This fully equipped technical school worked in Austria to maintain the tradition of photography as a discipline of civil buergerlich-gediegener handicraft and engineer art. The establishment of the GLV was known world-wide and received their international reputation for the work completed during the term of photo chemist Josef Maria Eder who was the first director from 1888 to 1923. Industrial magnates of photographic production did not develop in Austria as dynamically as in other countries. In the last quarter of the 19th century however from 1882 to 1918 and still under the monarchy, the very active protogewerkschaftlichen initiative came into being, which later became Verein photographischer Mitarbeiter.

Finally in 1887, the earliest association of moderately active photographer collectives in Europe was the Club der Amateur-Photographen in Vienna (renamed Camera Club in 1893,) stressed and aimed for an artistic dynamic. The first large exhibition in the Austrian museum for art and industry was organized by the "club." In 1888 they held a show, the first of which was for amateurs only. Doing this was enough however to shake up some members of the established photographic community in Vienna. More specifically, in exhibiting their photographs in this unusually, selectively arranged international exhibition, the amateur photographers challenged the aesthetic guidelines established by the contemporary painters and commercial artists. Most notable were the images that came from English photographers such as Peter Henry Emerson and George Davidson. It was from their design principles in the "Paysage Intime" that the idea was had to minimize the hole though which light came, later becoming known as small apertures and extended depths of field. The most consistent representatives of these techniques were Hans Watzek, Hugo Henneberg and Heinrich Kühn as well as the American art photographer, Alfred Stieglitz all of whom crucially changed the international photography scene circa 1900.

Maren Gröning

See also: Burger, Wilhelm Joseph; Eder, Joseph Maria; Natterer, Johann and Joseph; Petzval, Josef Maximilian; von Voigtländer, Baron Peter Wilhelm Friedrich; Société française de photographie; Emerson, Peter Henry; Davidson, Thomas; Kühn, Heinrich; Watzek, Hans; and Stieglitz, Alfred.

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SOCIETIES, GROUPS, INSTITUTIONS, AND EXHIBITIONS IN BELGIUM

The multiple and potentially protean nature of photography is clearly reflected in the broad range of institutions which assisted the introduction of the new medium to Belgium—artistic, technological, and learned. the patrons of the fine arts were the first to witness a public display of daguerreotypes in Belgium at the triennial exhibition held in Brussels in September 1839. the crowded walls of competing portraiture, landscapes, and history paintings also welcomed five daguerreotype plates—two by Daguerre (who had presented them to King Leopold I), and three local views by rival Brussels pioneers Jean Baptiste Jobard (1792–1861), inventor and journalist, and Antoine Dewasme (1797–1851), lithographer and director of the Société des Beaux-Arts.

Simultaneously, the country's leading learned society, the Académie royale des Sciences et Belles-Lettres (Royal Academy of Science and Literature), was called upon to evaluate a paper process invented by Albert Breyer (1812–1876), a medical student, whose Breyerotype was a form of reflectography or photocopy enabling direct positive prints of engravings, drawings, and written documents. the Académie would reprise this role in the 1840s and 1850s, when work by W.H.F. talbot, Abel Niépce de Saint-Victor, Guillaume Claine and Edmond Fierlants was submitted for opinion, in the latter two cases within the context of grant applications made to the Belgian government. Furthermore, photography featured in one of the prize essays set by the Académie in 1847, on a topic covering "les avantages et les inconvénients de la découverte des procédés purement mécaniques" (advantages and drawbacks of the discovery of purely mechanical processes).

Another semi-official body to take a sustained interest in photography in the early decades was the Musée de l'Industrie, headed by Jean Baptiste Jobard in the 1840s. Despite its name, the Musée was more a technology centre and forum for the dissemination of inventions. As such, the progress of the new medium was monitored by the institution, a process culminating in the association of Gustave De Vylder (1824–1895),

engineer and teacher at the Ecole industrielle de Gand (Ghent Industrial College), where he gave public courses in photography for over thirty years, beginning in 1862. One of his pupils, Léonce Rommelaere (1839–1887), was appointed chemist at the Musée de l'Industrie in 1870, where he too instituted the practise of free public lessons in photography.

Very soon after its foundation in 1854, the Société française de photographie, pre-eminent in France, became a natural focus for the aspirations Belgian photographers eager to prove themselves on an international level. Many leading practitioners joined, such as Chevalier L.Pt. Dubois de Nehaut, Edmond Fierlants, and the great specialist in micro- and astronomical photography Adolphe Neyt (1830–1892). And it is thanks to membership of the Société française de photographie that the work of Louise le Ghait, the only significant woman calotypist in Brussels, has been saved from oblivion.

The French body also contributed to the success of the earliest photography exhibitions held in Belgium in 1856 and 1857. Photography had previously occupied a minor place in the state-sponsored trade fairs run under the aegis of the Association pour l'encouragement et le développement des arts industriels en Belgique (Association for the promotion and development of industrial arts in Belgium). Fearing that local production was lagging behind the international competition, Edouard Romberg, director-general for fine arts in the interior ministry, took the initiative to transform the event into a full-fledged photography exhibition for two years running. The 1856 exhibition, at which the Sociéte française de Photographie exhibited collectively, had a considerable impact. The purpose of stimulating local production was implicit in the nature of the trade fair, as one commentator observed: "Belgian photographs have been far surpassed by those from other countries… Belgium will derive most benefit with regard to photographic progress, from the lessons given by her neighbours" (Thomas Phipson, "Universal Exhibition of Photography, Brussels," *Journal of the Photographic Society [of London]*, 3 (21 October 1856): 146, reprinted from *Cosmos*, 9 (3 October 1856): 345).

Belgium had to wait nearly twenty years and the creation of its first photographic society before an exhibition of equal significance would be organized. The Association belge de Photographie was founded in 1874 as a national and official body with King Leopold II as patron. The initiators were De Vylder and Rommelaere, who were appointed respectively first president and general secretary, and two young engineers, Paul Davreux (1845–1905) and Léon Laoureux (1845–1915). A founding membership of 143 grew steadily decade by decade, from 200 in 1880 and 381 in 1890 to 650 in 1898 and 727 in 1905. It would remain a strong (if latterly less predominant) force in the domain in Belgium until the outbreak of the second world war, when its collections and library were dispersed.

Throughout its existence, the Association belge de Photographie remained true to its twin purpose of acting as a springboard for artistic creation and scientific advance. Article 2 of the articles of association reads: "Son but est purement artistique et scientifique. Elle poussera au développement des progrès scientifiques par des réunions périodiques, des communications, l'essai des nouveaux procédés, des expositions, et si les ressources le permettent, par la publication des faits les plus intéressants" (Its purpose is purely artistic and scientific. It will promote the development of scientific progress by means of regular meetings, communications, experimenting new processes, exhibitions, and, if resources allow, by the publication of news reports.) Despite the explicit disavowal of commercial interest, the Association was a broad church, counting many professional photographers and owners of supply houses amongst the membership and officers, such as Joseph Maes, president from 1889 to 1895. Its breadth of membership and scope proved an advantage, enabling many functions to be delegated and practical work to be carried out at monthly meetings of the regional sections—initially Brussels, Liege, and Ghent, followed by Antwerp in 1890, Namur in 1893, and Mons in 1901. Given the centripetal force of the Association, the few independent local clubs set up in the wake of the growth in amateur photography in the 1880s made little impact. Exception may be made for the Cercle Photographique de Bruges, founded in 1887 as an offshoot of the Excelsior literary society, in a part of Belgium which failed to produce a regional section of the Association, and the Photo-Club de Belgique, founded in 1895, an amateur body of excursionist tendencies and a total membership of around 100.

The Association belge de Photographie, in fulfilment of its mission, organized international exhibitions of photography, both images and material, in 1875, 1883, and 1891. It was also present at the jubilee fair held to celebrate fifty years of nationhood in 1880 (and at which Désiré Van Monckhoven was honoured with a display of his publications) and the international exhibitions held in Antwerp in 1885 and 1894, and Brussels in 1888.

With its presiding spirit of internationalism, the pictorialist movement quickly gained ground in Belgium, influenced both by proselytising of the Linked Ring and by adherents of the Photo-Club de Paris, where Edouard Hannon (1853–1931) regularly exhibited. the Linked Ring counted two Belgians among its members—the multi-talented Brussels professional Alexandre Drains (1855–1925), and textile merchant Hector Colard (1851–1923), whose international outlook made him an ideal intermediary for interpreting and presenting, to a Belgian audience, the diverse intellectual and aesthetic

currents of the so-called French and English schools. the Association belge de Photographie, having hosted a well-received exhibition of British pictorialists in 1892, briefly lost the initiative when an independent Salon photographique was co-organized by Hannon at the Cercle artistique et littéraire [Artistic and Literary Circle] in Brussels in 1895, at which prints by leading lights of French pictorialism such as Demachy and Puyo featured alongside Belgian work. Henceforward, the Association belge de Photographie regained and maintained momentum, organising major salons in 1896, 1898, and 1902. Its size in Belgium and reputation abroad enabled it to overcome with ease the threat posed by the small secessionist movement L'Effort, active 1901–1905 around interior designer Léon Sneyers (1877–1949) and photographic supply-house owner Léon Bovier (1865–1923). Other leading pictorialists in Belgium, notably Gustave Marissiaux and Léonard Misonne, remained loyal to the Association.

The increase in the medium's popularity and profile at the turn of century gave rise to two very different institutional initiatives in photograph collecting. As a sign of pictorialism's social acceptance, a photography section was established within the Musées royaux des arts décoratifs et industriels [Royal Museums of Applied Arts] in Brussels in 1896. the Musée photographique, as it was known, purchased a total of 68 exhibition prints shown at pictorialist salons in Brussels between 1895 and 1901, 27 of which remain in the holdings of the Cinquantenaire Museum up to the present day. With the waning of pictorialism, the will to pursue the acquisition of photographic prints as artworks dissipated in Belgium. A Musée belge de Photographies Documentaires (Belgian Museum of Documentary Photography) was founded in 1901 as an offshoot of the Photo-Club de Belgique, along the lines of Léon Vidal**'s** Musée Documentaire in Paris. It was reported shortly afterwards that the Museum possessed 23,000 items. Renamed the Institut International de Photographie in 1905, the fate of this body's collection is unclear.

STEVEN F. JOSEPH

See also: Daguerre, Louis-Jacques-Mandé; Niépce de Saint-Victor, Claude Félix Abel; Claine, Guillaume; Fierlants, Edmond; Société française de photographie; Chevalier L.Pt. Dubois de Nehaut; Maes, Melchior Florimond Joseph; van Monckhoven, Désiré Charles Emanuel; Photo-Club de Paris; Puyo, Émile Joachim Constant; Demachy, (Léon) Robert; Marissiaux, Gustave; Misonne, Leonard; and Vidal, Léon.

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SOCIETIES, GROUPS, INSTITUTIONS, AND EXHIBITIONS IN CANADA

Professional Organizations

Given Canada's small population spread out over a large geographic area and the existence of only a handful of professional photographers in any one urban centre up until the 1890s throughout the country, many Canadian professional and amateur photographers took out memberships in United States and international associations such as the National Photographic Association (founded 1868) and its successor the Photographers Association of America (established 1880). Montreal's Alexander Henderson in 1859 was the first member from North America of England's Stereoscopic Exchange Club. Lacking a local social or business outlet other than newspapers and short-lived magazines, commercial photographers regularly communicated information about their business (and sometimes personal) issues. Montreal's William Notman started in the 1860s with *The Philadelphia Photographer* and *Anthony's Photographic Bulletin*. Victoria's Hannah Maynard submitted samples of her own and her husband Richard's work in the 1880s and 1890s to the *St. Louis and Canadian Photographer*.

Many commercial photographers worked in isolation and, except for the most successful, appear to have mistrusted one another. Some of the newspaper advertising was extremely vitriolic. One of the initial attempts at a formal organization for professionals, the Toronto Photographic Society, lasted about a year from its start around March 1869. The society formed to battle price cutting. The St. John Photographers' Association made an even briefer appearance on the scene; its president, Carson Flood, is listed in an 1871 national business directory. The Photographic Association of Canada, centred in Ontario, organized on

24 January 1884 and was later known as the Ontario Society of Photographers; among its first leaders was Toronto photographer S.J. Dixon. The PAC's first president was R.D. Bayley, who as president of the Huron Photographic Association helped initiate the PAC. It survives today as the Professional Photographers of Ontario which is part of the Professional Photographers of Canada.

Amateur Associations

The earliest formally organized associations of Canadian amateur photographers, generally known in 19th century Canada as camera clubs, were established in the 1880s. The first independent camera club in Canada was the Quebec Amateur Photographers' Association located in Quebec City (1884–1886). The Quebec Camera Club, also in Quebec City, was founded 8 February 1887 and disbanded in May 1896. The Montreal Camera Club, preceded by the Montreal Amateur Photographic Club (1886–1889), organized in 1890 and incorporated two years later. The Montreal Camera Club still operates. Rivalling the province of Quebec as an early centre of amateur associations is Ontario. The Toronto Camera Club began on 23 February 1887 as the Photographic Section of the Royal Canadian Institute. The club went its own way on 17 March 1888 as the Toronto Amateur Photographic Association, then changed its name on 7 December 1891 to the Toronto Camera Club, followed by incorporation in 1893. The club celebrated its official centennial in 1988 and continues to exist. The Hamilton Camera Club started as the Hamilton Scientific Association, Photographic Section on 18 April 1892, and was followed by the Camera Club of Ottawa in 1894 and both are into their second century. Several other camera clubs in Ontario are noted in Koltun (1984).

Attempts to organize amateurs in other urban centres did not fare as well as Quebec and Ontario where the bulk of the Canadian population resided and still does. Sprange's *Blue Book for Amateur Photographers* (1895) reported the Winnipeg Camera Club, begun on 27 September 1892, as defunct. The Saint John Camera Club was organized on 9 June 1893 and lasted at least into the mid-1910s. The Halifax Camera Club was organized in March 1896. There were two efforts to create camera clubs in Vancouver, the first in 1895, the second in 1897. The later Vancouver Camera Club had 56 members in March 1897, but appears to have disbanded by 1899 or 1900. One of the last Western Canadian amateur associations to organize in the 19th century was the Associated Photographers of Manitoba and Northwest Territories which met on 13 July 1899 in Winnipeg, Manitoba, for its first annual meeting. When women applied for membership in the camera clubs, only the Toronto Camera Club is known to have debated the issue and agreed to admit them in November 1895.

Associations composed primarily of artists or those broadly interested in the arts, especially after the Kodak revolution, such as the Vancouver Art Association (founded 1890) and Vancouver Arts and Crafts Association (established 1900) also included amateur photographers and exhibited their works. The Canadian Lantern Slide Exchange (1893), centred around Toronto, Hamilton and Montreal in Ontario and Quebec, was modelled on the American Lantern Slide Interchange (1885). The amateur clubs often included professional photographers among their membership. William James Topley maintained a membership in the Camera Club of Ottawa, likely from its start in 1894 until 1921, three years before his death. Other professional photographers such as Les Livernois firm in Quebec City, Quebec, and the Edwards Brothers in Vancouver, BC, played an important role in helping manage the amateur revolution in photography brought about by Kodak roll film. They rented or sold cameras and supplies, helped process dry plates or film, and, most importantly, offered space and darkroom facilities for amateur organizations to meet and hone their technical skills.

Public and private art galleries, museums, libraries, religious organizations (chiefly in Quebec), private societies, companies such as the Canadian Pacific Railway, and academic institutions all played a significant role in preserving Canada's early photographic history before the establishment throughout the 20th century of government-operated archives by provincial and local jurisdictions. Some camera clubs, such as the Toronto Camera Club, maintained their own records back to their origins and only deposited these with national or other archives in the 20th century well after their founding. Several major collections by 19th century Canadian professional photographers such as William Notman, however, were preserved as business records and donated or sold in the 20th century to public institutions. Some studio collections by 19th century photographers, primarily in the Maritime Provinces (New Brunswick, Prince Edward, Nova Scotia and Newfoundland), continue to remain in private hands into the 21st century. Prints from Isaac Erb's (1846–1924) negatives, a New Brunswick landscape and industrial photographer beginning in the 1870s, are sold on the Internet through the collection owner Vintage Photo & Frame Ltd.

Of the provinces which were a part of the Confederation of Canada in the 19th century, only British Columbia and Nova Scotia appear to have had publicly accessible government archives prior to 1901. While all the provinces and their colonial predecessors had records-keeping operations, these were mainly paper-based. Historic photographs, where still used in the course of a government agency's work, such as the

Geological Survey of Canada, may not yet be transferred to an archives. The Canadian Archival Information Network or CAIN is a national database describing archival records, including photographs, at the fonds or collection level. All 13 provincial and territorial archival computer networks are linked to CAIN.

The National Archives of Canada (formerly the Public Archives of Canada, founded 1872) did not establish its Picture Division until 1907, but had acquired photographs a decade earlier. As of March 2002, the National Archives holds over 21 million of photographs dating back to the earliest days of photography. About 400,000 online descriptions of photographs preserved by the National Archives are linked to nearly 4,000 digital images in its online, Web-based research tool ArchiviaNet. The National Archives also issued research guides to its photographic collections and published the *Guide to Canadian Photographic Archives* (1984), a union list describing publicly accessible photo collections across the country.

The National Gallery of Canada (founded 1880 and officially opened 27 May 1882) contains an international collection of around 20,000 photographs dating back to 1839, descriptions of which, along with selected digital facsimiles, are available through its CyberMuse Web site. Although the NGC exhibited photographs as separate art forms beginning in 1934, its own Photograph Collection was not established until 1967.

As of March 2002, provincial and territorial government archives in Canada with active photograph digitization programs containing 19th century photographs (not for online exhibits) are, in chronological order, the British Columbia Archives (1993), the Archives of Ontario (1998), the Northwest Territories Archives (ca. 2000), and the Nova Scotia Archives & Records Management (2001).

First established in 1894 as part of the Legislative Library, the BC Archives began collecting historical records, including photographs, in 1898. Today it preserves the largest number of 19th century photographs of the province. Some of the significant 19th century photographers represented in its holdings are Frederick Dally, Francis George Claudet, Richard and Hannah Maynard, and Edward Dossetter. As of March 2002, the BC Archives Web site describes over 110,000 photographs linked to over 65,000 digital images.

The Notman Photographic Archives, operated within the McCord Museum, McGill University, Montreal, provides Web-based access to 24,000 digital photographs from among the 1,000,000 photographs by the William Notman firm and other photographers.

The other significant public collection of 19th century digital photographs is available through the privately funded Glenbow Library and Archives Web site. Part of the Glenbow Museum, the Glenbow Library and Archives collection of online photographs (nearly 60,000 digital images and descriptions) are also searchable through the Images Canada Web gateway. The Glenbow Library and Archives preserves over one million photographs.

Canadian photographers, like their counterparts around the world, used their own business spaces from the very beginning of photography to exhibit their work. The first daguerreotypes of Canada taken in early 1840 by Hugh Lee Pattinson may have been exhibited the same year in London or Paris by Antoine-François-Jean Claudet and Noël Marie Paymal Lerebours. Works by Canadian photographers were formally exhibited at international world's fairs in Paris, London and other European urban centres, as well as the United States. The first international exhibition at which Canadian photographers were represented was the 1855 Paris Exhibition. Thomas Coffin Doane (1814–1896) from Montreal, Quebec, and Eli J. Palmer from Toronto, Ontario, the only two Canadian photographers exhibiting, received honourable mention for their work. At the 1862 London International Exhibition, William Notman was awarded a medal and Francis George Claudet, the youngest son of Antoine-François-Jean Claudet, received an honourable mention for his landscape photographs of New Westminster, BC. Claudet's father was one of the judges, but whether he excused himself is not known. Some of the portraits on patent leather exhibited by George Robinson Fardon at the 1862 world's fair were discovered late in the 20th century by the Victoria and Albert Museum and their identity verified by the author in 1999 as Fardon's work. Examples of other international exhibitions at which Canadian photographers were represented are the 1865 Dublin International Exhibition (J.B. Livernois of Les Livernois), the 1867 Paris Exposition Universelle (Wellington Chase; J.B. Livernois of Les Livernois; William Notman), the 1876 United States Centennial (International) Exhibition (J.S. Climo; Alexander Henderson; William Notman), the 1878 Paris Exposition Universelle (J.E. Livernois of Les Livernois [ed. Note: this is J.B. Livernois' son]; William Notman), the 1886 Colonial and Indian Exhibition London (Mrs. R.E. Carr; Richard Maynard; William Notman), the 1888 Barcelona World's Fair (S.H. Parsons), and the 1893 World's Columbian Exposition Chicago (W.H. Boorne; Les Livernois). Governments, both national and provincial, also commissioned photographs or purchased existing images which were incorporated into international exhibition displays as a means of illustrating and promoting their regions.

At the national level, there were no competitive exhibitions consisting solely of photographs as an art form until 1934 when the National Gallery sponsored the Canadian International Salon of Photographic Art. Prior to this time, the camera clubs and photographers

such as Vancouver's John Vanderpant organized open and invitational photography salons. The first Canadian camera club exhibit was staged by the Toronto Camera Club in 1891. Prior to this, industrial or agricultural fairs at the provincial or local level were the primary venue for the competitive exhibition of photographs by professionals and amateurs. Possibly the earliest such instance in Canada was the display of daguerreotypes at the Nova Scotia Industrial Exhibition in October 1854. Among the first Canadian art exhibitions which included photography was one hosted by the Art Association of Montreal (now the Montreal Museum of Fine Arts) in 1865. Works by William Notman and Alexander Henderson were on display that year and by the latter in 1867. The Royal Canadian Academy of Art (established 1880) did not begin to recognize photography as an art form until at least the 1960s when it awarded Ottawa's Yosuf Karsh its RCA Medal (1964). Some of the founders of the RCA, however, utilized photography in their landscape painting.

All Canadian societies and groups who sponsored exhibitions saw steady growth and interest in photography in the first decade of the 20th century as the Pictorialism tradition blossomed. As noted by H. Snowden Ward, co-editor of *Photograms of the Year*, based upon his 1899 visit to a Toronto Camera Club meeting:

> The Canadian amateurs … feel their somewhat isolated position … but by means of careful study and discussion of the articles and reproductions in the journals, as well as by very frank, breezy criticisms at their own lantern-slide evenings, they are doing all that lies in their power to remedy these deficiencies.

DAVID MATTISON

See also: Notman, William & Sons; Topley, William James; Livernois, Jules-Isaïe and Jules-Ernest; and Claudet, Antoine-François-Jean.

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National Archives of Canada, ArchiviaNet: On-line Research Tool, Photographs Database, Web: http://www.archives.ca; National Gallery of Canada, CyberMuse, http://cybermuse.gallery.ca/ng; Notman Photographic Archives, McCord Museum, McGill University, Web: http://www.mccord-museum.qc.ca; Nova Scotia Archives & Records Management, http://www.gov.ns.ca/nsarm; Prince Edward Island, Public Archives and Records Office, On-Line Exhibits, http://www.edu.pe.ca/paro/exhibits/default.asp

SOCIETIES, GROUPS, AND EXHIBITIONS IN FRANCE

The birth of the French photographic institution followed the development of the scientific and historical academies in the country. The same cultural phenomenon took place in all European countries as well as in their colonial territories.

The photographic societies were associations whose purpose was to ameliorate photography and diffuse it to the majority.

During the 19th century, "in science, if the lonely genius make the most important discoveries, the scientific societies (…) make them understandable, propagate and improve them." ("Si c'est le seul génie qui fait dans les sciences les grandes découvertes, ce sont les sociétés savantes (…) qui éclaircissent les découvertes, qui les répandent et les perfectionnent," Dictionnaire de la langue française, Littré, 1863–1871)

This century has been considered as the century of technical discoveries. Diffused by specialized newspapers, Expositions universelles and academies, sciences became a new subject of interest, the beginning of their democratization.

The photographic academies were very different by their members' type, their research field, even their philosophy. The technical societies were the most important by the number of their members because they

were opened for all amateurs and professionals. Almost all artistic societies were dedicated to amateurs. The professional associations considered themselves as genuine companies union.

Most organizations developed themselves after 1875, following the simplification of the photographic techniques, particularly the introducing of the gelatin-silver bromide. As Jean-Pierre Chaline, the French historian, exposed, in France, academies grew up between 1875 and 1884. The expansion of the photographic associations' foundation took place later than the development of classic academies. For the photographic societies, this happened above all between 1887 and 1896.

These societies or associations established the scientific or artistic studies like a bond of the nation. Upper classes people gathered themselves to exchange on scientific or artistic experiments and knowledge. The first photographic society was called the Société héliographique, created in 1851 to develop photography and its applications but dissolved in 1853, the same year the Royal photographic Society was founded in Great Britain. One year later, in 1854, a new society, also based in Paris, called the Société française de photographie, replaced it.

Founded on the Académie des Sciences exemplification, this society was much more science-oriented: its aim was to ameliorate and diffuse photographic techniques (See Articles of association, *Bulletin de la Société française de photographie*, January 1855). They met each month to talk about both little improvements and important discoveries. As its model, practice was the only way to recognize a new technique. Researchers came to present their invention before the Society. Then, a little group (five or six people) formed a commission to experiment the novelties. One month later, they had to give their conclusions and judge them in a report. This account was published in the Bulletin de la Société française de photographie, the Society's journal released every month for the members since January 1855. Most of them were amateurs: they did not live of their passion but had enough time to experiment and devoted their life to photography.

At this time, knowledge was freely diffused and scientists offered to the community the results of their researches, based on common exchange. Transmission was the main way to evolve. This society became the pattern for all others. The Société boulonnaise de photographie located in Boulogne, in North of France, in 1856, even asked to use its status as a model.

The centralized organization of French politics probably influenced the creation of the photographic sociability: the most important of them, and the first, was located in Paris. Each town wanted to have its own scientific or historical academy. In the French countryside, photographic associations have been principally founded by a member of this main society: opened to every kind of members, often with a library, a laboratory and a newspaper dedicated to the photographic news and the life of the association.

As time went by, the addressed subjects evolved. At the beginning, before the 1870s, the different techniques—the collodion process, the negative albumen process, the collodio-albumen process—and the different cameras were the most important questions. With the gelatin-silver bromide's arrival, new topics appeared, such as picture quality, snapshot speed, and above all the recognition of the photography as an art and not only as a scientific help.

More than the professional photographers, the amateur members of these groups contributed to ameliorate and diffuse the techniques. The photographic societies organized courses and lectures—notably from the 22 November 1891 to the 10th of April 1892, at the Conservatoire national des Arts et Métiers, in Paris—explaining the processes, the best way to choose the camera, and how to use the best technique at the best moment.

Most of the members used to write books and articles to spread photography to the general public. One of the best known popularizer in France was Albert Londe, publisher of The snapshot photography (La photographie instantanée) in 1886 and The modern photography (La photographie moderne) in 1888. The will of the French photographic society was to give a status to photography, between science and art.

In the 1890s, the French society changed: entertainment became part of life not only for the upper classes, but for middle classes as well. With the gelatin-silver bromide and the reducing size of the camera—the most known, but not the only one, was probably George Eastman's Kodak box, photographic democratization was on its way. Photography was used during a jaunt, a trip, or to capture the most important life times of the families.

Following these changes, appeared a new kind of association led by Albert Londe, Maurice Bucquet, and Gaston Tissandier. Its name was the Société d'excursions des amateurs photographes created the 4th August in 1887. Its purpose was to "organize excursions and practical lectures for the development and the diffusion of the photographic knowledge" ("Société ayant pour but d'organiser des excursions et des conférences pratiques en vue du développement et de la diffusion des connaissances photographiques," in the first article of association). Several societies of this kind were created in France, in almost every department.

At the same period, another type of photographers' group appeared. Their members were also amateurs, but with a different aim. These artistic societies, the photo-clubs, existed since 1888, date of the Photo-club de Paris birth. One more time, this association was the

pattern for the others. The photo-clubs were associations where the members were strictly amateurs. Principally, these associations requested the recognition of the photography as an art.

First, members of the Photo-Club de Paris and the Société d'excursion des Amateurs photographes were almost the same, including Maurice Bucquet, Albert Londe and Jules-Etienne Marey. Quickly, theses societies' respective positions became diametrically opposed. The Excursion society lauded photography as a healthy entertainment—it was most of time combined with sports like bicycle or walk—when the Photo-club exalted photography as an aesthetic and conceptualized art. In fact, the Photo-club recommended the pictorial photography.

In 1892, they presented in the "first international photographic exhibition and the linked arts" (Première exposition internationale de photographie et des arts qui s'y rattachent) a new aesthetic. They showed staging images, playing with lens aberrations to give an ethereal and vaporous touch similar to drawings, mostly printed with gum-bichromate. Pictorial photography was an international movement first represented by British photographers like Peter Henry Emerson or Julia Margaret Cameron. This photographic practice was known in France thanks to universal exhibitions and books, notably "Naturalistic photography for students of the Arts" written by Emerson and published in 1889.

In France, the photo-club members had a particular position because they struggled for the photographic recognition as art, and also for the amateur status. According to Paul Gers in 1889, the 12th December, concluding on the Exposition universelle in Paris, "the artistic value of their (the amateurs) works, (could) compete with the specialist's one, the professional's one ("la valeur artistique de leurs travaux, lutter avec succès contre les spécialistes, les professionnels," in Photo-Club de Paris, Séance du 12 décembre 1889, Journal des Sociétés photographiques 1890–1892, 31).

Then, the amateur could have been considered as a better artist than the professional, whose sole purpose was to make money with his practice. They refused little camera boxes, choosing the camera obscura, refusing the instant photography and choosing the staging photography, in fact refusing technical progress.

These pictorial photographers proposed to consider a kind of hierarchy in photographs: their practice would have been the most important, as the noble one, whereas the excursionist's practice would have been seen as an entertainment able to give travel impressions and the professional practice would have been despised because of making money.

In France, particularly in Paris, photographers had to choose their side: excursionist or pictorialist. However, the splitting was not that strong in the countryside where some associations like the Photo-club rouennais, located in Normandy, belonged to both sides. Created in November 1891, its presidents were scientists like the naturalist Henri Gadeau de Kerville (1891–1892) or the physician Abel Buguet (1893–1900) but the association was opened to "excursionists and pictorialists" (See articles status of the Photo-Club rouennais, 1891).

However, these organizations had a common fight, and to give them coherence, the Union Nationale des Sociétés photographiques de France was created in 1892. Every year, a congress was organized by the Union in a different city, working on technical, artistic or juridic subjects.

From the very beginning of the photography, the pictures display, especially during the Expositions universelles, was considered as the best way to introduce techniques' newness. Actually, photography was held as a scientific technique, so processes were the most important distinctiveness.

To present their researches, the societies and the photo-clubs used the same methods: the exhibition. The societies proposed to the spectator a presentation copied on the fine arts Salon. Another pattern was probably the exhibition of the Society of Arts in 1852 (or 1851) in London composed by Joseph Cundall, member of the Calotype Club with the help of Roger Fenton, active member of the future Photographic Society of London.

The first exhibition was organized by the Société française de photographie in 1855, from the 1st August to the 15th November. The photographs were divided in sections: the different processes as salted paper print, albumen paper print, daguerreotype, and then by subjects like portrait, landscape and scientific photography. The foreign photographers were accepted for the second show, in 1857. Several countries were represented and a jury awarded some of the photographers, like the Universal exhibitions did.

For the first edition, the amateurs were more important in numbers, but two years later, professionals were represented almost as much as the amateurs. The Société française de photographie made these shows approximately every two years.

The Expositions universelles were the occasion to show the new photographic techniques and processes. There were also exhibited ancient techniques as a kind of summary. One of the great wills of the societies and the photo-clubs was to give credibility to the photography as an art. They all tried to make the government understand the importance to give them an exhibition place in the fine arts section, not in the techniques' one: this request provoked a great scandal in 1900. Foreign photographers—principally pictorialists—refused to come and expose their production at the exhibition in Paris because it was scheduled in the Education palace and not in the art one.

Societies and photo-clubs in France, as well as their lectures and publications, have been prevailing in the fight of the photography's recognition. They allowed the grouping of different kind of people in the same purpose. The photographic institution, which had been divided in the 1890s, recovered its unity after 1900 and gave birth to the first section dedicated to the photography in a museum in 1926, in the Conservatoire national des Arts et Métiers, a technique museum, in Paris. At last, one of the ultimate purposes was accomplished.

MARION PERCEVAL

See also: Londe, Albert; Marey, Etienne Jules; Tissandier, Gaston; Wet Collodion Negative; Wet Collodion Positive Processes; Société française de photographie; Photo-Club de Paris; Pictorialism; Gum Print; Emerson, Peter Henry; and Cameron, Julia Margaret.

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SOCIETIES, GROUPS, INSTITUTIONS, AND EXHIBITIONS IN GERMANY

Throughout the 19th century the German speaking countries hosted more than 100 photographic societies, mostly on a local basis but aiming at a greater public, too. The first group of practitioners met regularly as early as 1840 in the studio of Carl Schuh in Vienna but there were no significant implementations until 1857 when three German photographers called for the foundation of a Society of German Photographers (Allgemeiner Deutscher Photographen-Verein) following French and English examples. Formally founded by more than 40 participants the society seemed to flourish within the next years, including the initiation of its own journal *Photographisches Archiv* edited by the founding fathers Julius Schnauss and Eduard Liesegang. But in 1863 the society ceased to exist and was basically replaced by the freshly inaugurated Berlin Society for Photography (Photographischer Verein zu Berlin) which was founded by Hermann Wilhelm Vogel. He split this society into a German Photographic Society (Deutscher Photographen-Verband) by 1867 which existed—due to political as well as internal reasons—only for another year on a national basis. For the next 30 years, all attempts to organize an annual conference of German photographers or found another society for the interests of all photographers were condemned to fail. Only in 1897, the newly released copyright law forced 2500 photographers to constitute a Law Protection Committee of German Photographers (Rechtsschutzverband Deutscher Photographen) which finally turned into a Central Committee of German Photographers (Centralverband Deutscher Photographen) in 1902. The Austrian history is different as the Photographic Society of Vienna (Photographische Gesellschaft in Wien), installed in 1861, gradually grew into the official function of uniting all Austrian photographers and industries of the field.

There were numbers of smaller societies and interest groups among photographers, too. Besides local groups, of which those in Berlin, Hamburg, Frankfurt on Main, Weimar, and Chemnitz were the most active ones there were groups of theater-playing photographers, of photographic industries, of suppliers of photographic materials, and of photographic assistants. Although 10% of all photographic employees in the late 19th century were female there has been no group or society to pursue their interests. As early as the 1850s there were smaller local groups in amateur photography but there were societies in amateur photography before the foundation of Society for the Improvement of Amateur Photography (Verein zur Förderung der Amateur-Photographie) in Berlin in 1869. The German Society of Friends of Photography (Deutsche Gesellschaft von Freunden der Photographie) set up in 1887 had to prepare the big exhibition for the celebration of photography's 50th anniversary, and a Free Photographic Society (Freie Photographische Vereinigung) was the first attempt in the creation of a pressure group in Fine Art Photography.

Setting up institutions in photography seemed a lot more complicated. In 1853, Hermann Krone in Dresden launched his first school of photography offering more than the average basic courses as given by nearly every daguerreotypist before. This private institute was converted in 1869 into a part of the Dresden polytechnicum, and Krone became the first official instructor in photography on a technical basis. The first class and laboratory in photochemistry was installed at the Berlin University in 1884, Hermann Wilhelm Vogel the first to hold the seat being followed by Adolf Miethe, Otto Mente, and Erich Stenger. By 1888, Joseph Maria Eder had founded the Higher Institute of Graphic Arts (Hoehere Graphische Lehr- und Versuchsanstalt) in Vienna which was to be followed in 1900 by a similar institution in Munich; the Lette school in Berlin specializing in teaching women created a class in photography in the same year. In 1885, the architect Albrecht Meydenbauer had set up the Prussian Institute for Photogrammetry

(Preussische Messbildanstalt) in Berlin to produce and catalogue photogrammetric data of buildings to be preserved.

Exhibiting photography started with its own birth: In fall 1839, there were a number of exhibitions showing Daguerreotypes from Paris in all big cities of the German speaking countries. The first one-man travelling show was installed in 1840 by Johann Baptist Isenring from the Swiss Schaffhausen but shown mainly in Southern Germany. Although the Germans were slow in presenting themselves at the World Fairs of 1851 and 1855 in London and Paris, photography had been present in both apparatus and images at all of the German industrial fairs from 1840 onwards. Permanent exhibitions in showrooms common in the USA since the 1850s only appeared irregularly in Vienna and Berlin in the 1860s. A special form of exhibiting stereo photographs was patented and installed by Ernst Fuhrmann in 1877 named the Emperor's Panorama (Kaiserpanorama).

Exhibitions of photographc images flourished for a relatively short time after photography's 25th anniversary in 1864. The same year, Anton Martin from Vienna had curated an exhibition on early photography and shown some work of his contemporaries; the German photographers concentrated on having a banquet with a burlesque comedy accomanying it. In 1865, Hermann Wilhelm Vogel and his Berlin society tried to establish an annual show of photography but these efforts ceased within three years. But by 1889, photography's 50th anniversary was the occasion for installing huge exhibitions of both images and apparatus in Berlin and Vienna. The Berlin exhibition held in the Prussian War Academy was the first to show the greater importance of amateur photography over the average craftmenship practised so far; the best featured exhibitor was a 25-year-old student of Hermann Wilhelm Vogel: Alfred Stieglitz. By this time Alfred Lichtwark had already been established as head of the Hamburg Art Hall (Kunsthalle); he started the annual exhibition of Fine Art Photography in 1893. A last instauration of the year 1895 combined all efforts described here: The South German Association of Photographers (Sueddeutscher Photographen-Verein) was founded to hold annual exhibitions for the sake of photographic art and artists in a Secessionist manner, it helped to instigate the Munich school of photography, it collected a large number of images to set the ground for a National Museum of Photography, and by a pilgrimage to Pope Leo XIII. in Rome, it installed Saint Veronica as the holy guardian for all photographers and their necessities.

ROLF SACHSSE

See also: Vogel, Hermann Wilhelm; Stieglitz, Alfred; and Lichtwark, Alfred.

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SOCIETIES, GROUPS, INSTITUTIONS, AND EXHIBITIONS IN ITALY

At the beginnings of photography, in 1839, Italy was not yet a unified state. In the months following the Arago announcement, daguerrotypy was presented in a number of the most prestigious scientific institutions and rapidly spread through the various states of the country, with different outcomes according to the different cultural influences. Even in unified Italy, however, the Italian photographic associations continued to maintain strong local characteristics.

The first photography associations were established primarily around the practice of calotypy, and were often also composed of foreign artists traveling in Italy on the classic grand tour. One of the first was the Circolo di calotipisti set up in Rome (1850–52) on the initiative of Count Frédéric Flachéron. The meetings were attended by Prince Giron des Anglonnes, Eugène Constant, Henri Peach Robinson, and Giacomo Caneva.

In March of 1888, the Associazione degli Amatori di Fotografia was established in Rome, presided over by the Duke of Artalia. The founders included Enrico Valenziani and the engineer and architect Giovanni Gargiolli. The latter, who had already founded the Società Amici della Fotografia in Naples in 1887, subsequently played an important role in the debate on the use of photography in an area traditionally covered by engraving, i.e. the reproduction of works of art, a sector in which Italian photography would always be extremely prolific. Obstructed in his project to create a photogravure laboratory at the National Copper-engraving Institute in Rome, he set up the Royal Photography Laboratory at the Ministry of Education (1892), which definitively established the use of photography in art reproductions.

Another active center was the city of Turin, which was particularly favorable to the diffusion of photography

also because of its geographical and cultural vicinity to France. Here the Unione Fotografica Italiana had been in existence since 1879, a longstanding association, whose activity was widely known.

The work of these first associations was mainly geared toward promoting meetings and information exchanges, particularly regarding technical innovations, as well as the dissemination of treatises and publications and the organization of training courses. The latter activity turned out to be essential, especially due to the absence of any official photography schools. Apart from some sporadic private initiatives, such as the Photographic Institute of Brindisi founded by Antonio Montagna, the teaching of Antonio Chimenti at the University of Rome (as of 1842), Semplicini in Florence (around 1850), and Ottavio Baratti at the Technical Institute of Milan in 1865, and the "Municipal evening school in chemistry for factory workers" in Turin, an authentic School of Photography was only established in Florence in 1905, following more than two decades of discussion, supported by the Società Fotografica Italiana.

The year 1887 was decisive: in Florence, during the works of the jury of the 1st Italian Photography Exposition, the foundations were laid for the constitution of the first national association. The Società Fotografica Italiana (SFI) was officially inaugurated two years later. The founders included many professional photographers, including Vittorio Alinari, Carlo Brogi (member of the Board of Directors), and the senator Paolo Mantegazza—known for his use of photography in a series of studies in anthropology and ethnology—who became its president. In October 1889, the SFI began publishing its own Bulletin, which continued until 1914.

One of the most important activities of the SFI was the organization of annual conferences, where participants discussed topics related to the history and technique of photography, its applications in a broad range of disciplines, and its relationships with art and custom. Both at the central level and through local groups, the SFI organized "photographic walks" and projections, and systematically collected Italian and foreign publications dedicated to photography. One of its most ambitious projects was to create a national museum of photography. Success came in 1902, with the opening of a Photography Archive at the Royal Uffizi Galleries in Florence, promoted by Corrado Ricci and encouraged by the Touring Club Italiano.

Around the SFI, many amateur photography clubs began to appear, often frequented by professional photographers as well.

In 1890, the *Circolo* Dilettanti Fotografi was set up in Turin, and many of its members were present at the photography exhibit in Venice in 1891. In 1892, the club participated in the organization of the Exhibit for the Promotion of the Fine Arts in Turin, in which over fifty photographers participated. The following year, in conjunction with the Turin branch of the Club Alpino Italiano (CAI), the association opened an exhibit of the works of amateur photographers, members of the CAI and other touring clubs from various Italian regions. In this regard, it should be underscored that photography assumed growing importance in the life of this type of association (CAI, Touring Club, Unione Escursionisti, and so on), and that these organizations, through the creation of thematic archives, expositions, and particularly magazines with a wide circulation, made a substantial contribution to the creation of a new image of the Italian landscape. No traces remain of the activity of the Circolo Dilettanti Fotografi after 1895, but it is known that many of the members converged, together with a group of professionals, in the more important Società Fotografica Subalpina. Founded in Turin in 1898 during the 1st National Congress of Photography, the Society was composed of about fifty members.

A branch of the SFI, composed of amateurs and professionals, was established in 1892 in Bologna, followed in 1896 by the Società dei Dilettanti Fotografi. The dissolution of these associations spawned the Circolo Fotografico Bolognese in 1900, the oldest body still in existence today.

Similarly, in Milan, the Circolo Fotografico Lombardo (1889) was established, as well as the *Associazione Lombarda*, which in 1893 numbered as many as four hundred members. In Milan, an important industrial and commercial center, the first national journal of photography, *La Camera Oscura*, began publication in 1863, directed by Ottavio Baratti and subsequently by Luigi Borlinetto. The journal published essays by Italian and foreign scholars, with a prevalently technical-scientific orientation, though often included topics of a political-cultural nature as well. But the experience that left the greatest mark on photography in Milan in the second half of the 19th century, in terms of both technical research and interest in the new creative languages, was *Il Progresso Fotografico,* a periodical created by Mario Gandini and Rodolfo Namias. By 1894, Namias had published more than thirty manuals and in 1895 he organized the Laboratory School of Applied Photochemistry.

In all the major expositions and conferences dedicated to photography in the last two decades of the century, the Istituto Geografico Militare was a constant presence. Its Photography Department was set up only in 1896, but the collections made by the military contained a large number of photographs made prior to that date, added to which was a large quantity of documentary material of geographic and ethnographic interest.

The involvement of Italian photography in exhibition events began with a sporadic presence in the general expositions, in which photography was initially exhibited

as a technical "marvel" rather than as a possible means of artistic expression.

In the pre-unification period, Bologna, the second most important city in the Papal state, could offer an emblematic example. In the 1850s, while the first studies and stable photographic production were beginning, the local administration attempted to foster the participation of local artisans in the Universal Expos of London and Paris. In parallel, exhibitions of a regional nature were promoted—occurring for the first time in the Agricultural, Manufacturing, and Industrial Exposition of 1856—in which photography was one of the products on display. In 1857, the official regulations of the exposition included a section of "Examples of Photography and Daguerrotypes," shown separately from the copper engravings and lithographs.

At the first Italian Exposition, held in Florence in 1861, all the important names in local photography participated. Most of the images displayed were portraits, while the large studios took the first steps in the sectors in which they would subsequently specialize: landscape photography and art reproduction.

Within important traditional events, such as the Italian General Exposition of Sacred Art in Turin, photography was not only widely present but the subject of a lively debate centered mainly on its artistic potentials (1898), leading to the creation of the important journal *La fotografia artistica* (1904–1917). In the General Exposition of Turin of the same year, "Photographic Art" appeared among the "Liberal Arts" and attracted a large number of visitors. At the end of the 19th century, Italian photography periodicals bore witness to the fact that discussions within the associations centered on issues analogous to those confronted in the other European countries: artistic photography, its definition as a cultural heritage, the genres, and the relationship with the applied arts, academy cultures, and the cultures of the secessionist movements.

Claudia Cavatorta

See also: Flachéron, Count Frédéric A.; Constant, Eugène; Robinson, Henri Peach; Caneva, Giacomo; Brogi, Giacomo, Carlo and Alfredo; and Alinari, Fratelli.

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SOCIETIES, GROUPS, INSTITUTIONS, AND EXHIBITIONS IN RUSSIA

Photography became very popular in Russia in the 19th century. Thus, in St. Petersburg alone, according to the population census of 1881, photography involved 382 out of 668,000 citizens, and according to the census of 1890 it involved 443 out of 954,400 citizens. Such large cities as Moscow, Kiev, Odessa and others also functioned as photography centers. Fairs housed mobile photo studios in which the technology of ferrotypes was primarily used.

The first photo amateurs were often rich or born noble. As the photo technology became simpler and cheaper, many middleclass amateurs became involved, often using photography as a means of self-expression. The self-expression through photography is why the amateur photographical societies appeared. Studying and analyzing the achievements of contemporary photographers and exchanging experiences were especially valuable for the provincial amateur photographers. Before the revolution of 1917 the number of photographic societies, although varying in size and cultural significance, amounted to more than 100.

The first decades of the development of photography were marked by a specific emphasis on the equipment. The first photographic societies were technical societies. The basis for the first large photographic society was formed by the Russian Emperor Technical Society (RETS) established in St. Petersburg in 1866. The RETS consisted of several branches. It comprised such

departments as chemistry, electricity, air-drifting, etc., which facilitated the inclusion of the use of other scientific findings in photography. The RETS established a fifth department in 1878, it was called the Photography Department. This initiative was headed by outstanding scientists like D. Mendeleev, photographers like L. Levitsky, I. Boldyrev, V. Carrick, and even artists like landscape-painter I. Shishkin and other prominent figures in Russian culture.

RETS' goals included the development of the technical, scientific and artistic aspects of photography, the establishment of theoretical and practical lecture courses the organization of nationwide photo exhibitions, and the establishment of a museum for photographic pictures. RETS had over thirty affiliates in various cities, including Moscow, Nizhni Novgorod, Odessa, Vyatka, Kiev, and others.

The leaders of the photography department in RETS, S. Proskudin-Gorski being one of them, believed that photography was documental by nature. In fact, he published articles on pictorial photography in *Fotograf Lyubitel* (*Amateur Photographer*) of which he was the chief editor. He stated that photography functioned as a way to fix surroundings in natural colors. After the revolution of 1917 the organization changed its name to Russian Technical Society (RTS). RTS organized a couple of photographic events and it fell apart in 1929.

In 1872 another special department for photography within a technical society was established in Moscow. The Society for Technical Ideas Dissemination (STID) developed out of need, a photographic society. The department's activities became obvious in 1883 due a general increase of interest in photography. The photo department of STID fostered the development and dissemination of artistic and technical ideas related to photography. The department was formed by such outstanding figures in Russian photography as E. Mattern, D. Yezuchyevski, and V. Vulfert. As the members of the society grew in number and the scale of activities became larger, it became clear that an independent photographic society was needed. So, in 1894 Russian Photographic Society (RPS) was established. It played a great role in the development of photography in Russia. As of the 1st October 1901 the number of its members amounted to 1,113. In 1899 a famous Moscow Photographer K.Fisher was elected the chairman of the society. The society set up a charity fund for those photographers who could no longer work due to an illness or a tragic accident. The meetings of the society were held in the Polytechnical Museum. At these meetings the members of the society used to discuss not only organizational matters and the latest photography related news but also scientific issues that were of general interest. Members of the society also used to demonstrate new photo equipment. Those who were interested, but not members of the society gladly visited the meetings, often totaling hundreds at times. The RPS organized out-of-town photo sessions in the beautiful suburbs of Moscow and nearby small towns. Often, this was followed by exhibitions and contests. The meetings of the society, as well as the journals, were full of heated debates on photography, its place in culture, and the direction of further development of photography. N. Petrov, a person knowledgeable on foreign photography and various theoretical and practical issues of photography, was a vigorous advocate of pictorial photography. He kept promoting the aesthetic concepts of pictorial photography in his speeches and articles for *Vestnik Fotografii* (*Photography Magazine*). He also tried to familiarize the Russian readers with the works by western masters. By 1930 the RPS had become dislocated and ceased to meet further.

The Photographic Society of Odessa (PSO) was founded in 1891. By January 1, it had 192 members. PSO studied theoretical as well as practical aspects of photography and gave an opportunity for the amateur photographers to travel for artistic and scientific purposes. The society members provided opportunities to photograph rare antiques and remarkable pieces of architecture. The PSO also held many of photo exhibitions. Additionally, the PSO established a commission for photo inspections that were needed for litigations.

There were also, among other societies, the Tiflis Society of Photo Amateurs, the Baku Photo Coterie, the Artistic and Photographic Society of Moscow, and the Saint Petersburg Photography Society.

The societies' major activities included the organization of photo exhibitions and providing support for members' participation in exhibitions held by other societies. Russian photographers took part in lots of international exhibitions, like the World Exhibition in London in 1863 and the International Exhibition in Berlin in 1865. Their works were an organic part of the world's art of photography. The works of Russian photographers were often prize-winning. The All-Russia Photographic exhibition in Moscow in 1867 housed over two thousand photos of typical Russian characters, scenes of folk life, and landscapes. Photography formed a large part of the International Polytechnic exhibition in Moscow in 1872. In 1882 a remarkable event in the history of Russian photography took place in Moscow, an All-Russia exhibition within the framework of a RETS session was held. Naturally the session included the photography department as well, thus setting into existence the first photographer's session in Russia. The exhibition prodded and worked to understand photo activity. The first specialized exhibition was held in Saint Petersburg in 1888 with 138 photographers participating and 820 photos exhibited. To mark 50 years since the invention of photography in 1889 the RETS organized exhibitions in Saint Petersburg and in Moscow. At the

St Petersburg exhibition there were some participants from abroad were invited by a commission of experts, such as F. Nadara.

Maxim Petrovich Dmitriev presented some of his works that later became a sensation of the Moscow exhibition. These photographs were some of his Volga sights, portraits, and genre scenes. In the 1890s international photographic exhibitions were no longer something extraordinary. At the Moscow International exhibition of 1896, organized by RPS, the foreign participants claimed all four contest nominations. Photographers from Denmark, Germany, France and other countries won gold and silver on equal terms with their Russian colleagues. Russia came to be fully integrated into the international photography process. The Session of Russian photographers and other specialists in the field synchronized to this exhibition a study of the key issues of Russian photography. The most salient question was of copyright for photographic works and products of photographic and mechanical processes. The law was proposed to the State Duma in 1908. Before the revolution of 1917, large photo-exhibitions took place in Russia like the International Photo Salon of Photography in Kiev in 1911, and a full-scale exhibition in St. Petersburg in 1912.

The societies and the exhibitions fostered the process of theoretical conceptualization of the artistic abilities of photography. The articles on this theme started to appear in Russia in the later half of the 1850s. The photographers and art critics wrote about the artistic potential of photography. However, these articles were not numerous and did not influence the world's photographic process.

During meetings of photographic societies, the question or problem that photography influenced life, or that life influenced photography was frequently discussed. For example, M.Dmitriev's album The Year of Poor Crops of 1891–1892 in the Nijnij Novgorod Province caused much influence on the public opinion and contributed to the activation of the government's aid to the ones who suffered from drought, typhus and cholera. It was this album that caused many photographers to begin to emphasize social problems in their work more often.

Many more heated debates on the specific features of photography, its language, the aesthetics of the art of photography, and the analysis of the achievements of world photography. In the beginning of the 1900s, a sharp debate arose in the photographic sphere regarding pictorial photography. This debate grew into an analysis of the nature of the artistic photographic image in general. Even though the works of the Russian photographers could not already influence the world's pictorial photography, it played an important role in the development of the Russian photography.

After 1932, all the artistic societies ended to create a space for the style of "soviet" realism.

ALEXEY LOGINOV

See also: Dmitriev, Maxim Petrovich.

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SOCIETIES, GROUPS, INSTITUTIONS, AND EXHIBITIONS IN THE NETHERLANDS

The first encounters the Dutch had with photography probably took place in Paris where they went in the 1840s for equipment, or in London where they visited the International Exhibition of 1851. A few years later, in 1855 the Dutch for the first time had the opportunity to attend an exhibition of international photography in their country. It was the Exhibition of Photography organized by the prestigious Vereeniging voor Volksvlijt (Society for Industry), initiated by amateur photographer Jan Adriaan van Eijk, which was held in the center of Amsterdam in the building of the artists' society Arti et Amicitiae on the Damrak. It was quite similar to the exhibitions held this same year and a year later in Paris and Brussels, with more or less the same photographers and comparable contributions. 65 contributors send more than a seven hundred photographs to Amsterdam—photographers, societies and publishers alike—mainly from France, but also from England, Germany and the Netherlands itself. Photographs by the Dutch photographers Eduard Isaac Asser and his friend the chemist Eugene Bour were hung next to contributions by Charles Nègre, Henri Le Secq, Charles Marville, Edouard Baldus and the Comte the Montizon. The same exhibition was held a second time, two months later in The Hague, inaugurated by the king.

In 1858, 1860, 1862, and 1865 similar exhibitions, the first three also in the building of Arti and Amicitiae in Amsterdam followed: showing photographs by Gustave Le Gray, Philip Delamotte and Nièpce de St. Victor alike. The Dutch were a little more oriented towards France than towards Britain. It must have been the same mixture of art, experiment and industry as

elsewhere. The photographs were offered for sale and the catalogues mention ' import duties' and names of dealers as well. Benjamin Brecknell Turner's views of Amsterdam for instance were not exhibited in 1858 by the photographer himself but by the Amsterdam publisher W. Kirberger. The 1865 International Exhibition for Arts and Industry took place in the newly built Dutch Crystal Palace, the Paleis voor Volksvlijt in Amsterdam. Nadars mammoth photograph of a Japanese was being shown to the Dutch public, as well as his images from the Paris' catacombs. Maxwell Lyte for instance presented his landscapes from the Pyrenees and Wilhelm Hammerschmidt Egyptian views.

In those first 26 years since photography was introduced, the Dutch didn't have proper photographic societies, nor organized groups of photographers. Manuals and treatises from everywhere were translated for the amateurs who were interested in the new technique of image making. Some magazines for fine arts or industry translated articles from European origin and off course many read journals from France, Great Britain and Germany. The Dutch periodicals *Algemeene Konst- en Letterbode* as well as *Album der Natuur* regularly mentioned exhibitions, technical innovations and details in the field of photography. The 1860s saw the rise and spread of commercial and professional photography. This took place on a far smaller scale however than in the larger European countries. The first magazine exclusively concentrating on photography, *Tijdschrift voor Photographie*, was introduced in this period, again initiated by J.A.van Eyck, and leaded by a captain in the army L.P. van Beek. In 1864 it appeared for the first time and it lasted until 1866. Another photographer needs to be mentioned here. The German Julius Schaarwachter emigrated from Berlin to Nijmegen and started his De *Navorscher op het gebied der photographie, Tijdschrift voor photographie en aanverwante wetenschappen* between 1865 en 1876. He was a strong protagonist of the founding of a society or union for professional photographers, which he however never effectuated. In general the journals mainly had a 'technical' character. Other known platforms for exchange were the gentlemen's societies of art, architecture and antiquities.

It lasted until 1872 before the first *photographic* society, the 'Amsterdamsche Photographen-Vereeniging,' was founded with A. Haakman as its president. The society had its own journal, like the first Dutch journal also mentioned *Tijdschrift voor Photographie*. Only 45 photographers joined the club. The members exchanged photographs and technical details and held lectures, as we can read in its minutes in the *Tijdschrift voor Photographie*. In 1887 this rather subdue society was dissembled. Within a year a new society for *amateur* photographers—for 'dilettantes'—under the name of 'Helios,' with a journal with the same name was founded in Amsterdam. Pioneer photographer Asser was one of its active members. In 1889 or 1890 the 'Nederlandsche Fotografen Vereeniging' was founded, which however didn't last long and of which we virtually know nothing.

The Amsterdam society was the first in a long row of local amateur photographer societies which were based in virtually every city, from Groningen to Arnhem, from The Hague to Maastricht. In the 1890s throughout the country a vast amount of international exchange took place by means of international exhibitions of the pictorialists. Foreign publications such as *Die Kunst in der Photographie*, *Camera Work,* and *The Studio* were well known. The work of British, American and German photographers, among them Alfred Stieglitz and Heinrich Kühn was often shown to the Dutch photographers and public. *Lux* (1889–1927) was an important monthly photography journal. Little known—only two numbers survive—was the journal *Lumen*, 'Magazine for Photography, Projection and Cycling,' founded by the Amsterdam photography firm Ivens & Co in 1897. The beginning of the 20th century saw the founding of two long lasting and important societies Nederlandse Fotografen Kunstkring (NFK) in 1902 as a real trade union and the Nederlandse Club voor Foto-Kunst (NCvFK) in 1907.

MATTIE BOOM

See also: Asser, Eduard Isaac; Baldus, Edouard; Kühn, Heinrich; LeGray, Gustave; Le Secq, Henri; Lyte, Farnham Maxwell; Marville, Charles; Montizon, Count de; Nadar; Nègre, Charles; Niepce de St. Victor, Claude Félix Abel; Stieglitz, Alfred; and Turner, Benjamin Brecknell.

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SOCIETIES, GROUPS, INSTITUTIONS, AND EXHIBITIONS IN THE UNITED KINGDOM

The material infrastructure of nineteenth-century British photography has received remarkably little attention, yet exhibitions, societies and journals provided the framework for practice and theory. For a period, the social organisation of photography in Britain revolved around gentlemen amateurs. However, the category of the amateur requires scrutiny. Historians of photography have seen amateurs as synonymous with landed aristocrats, engaged in the disinterested pursuit of knowledge: Talbot is the paradigmatic example. An oversimplified distinction is often made between landed gents and middle-class industrialists: in reality, no strong barrier separated these class fractions. However, a drift towards the professionalisation of photography is discernable during the period.

At the outset, photography was organised through bodies associated with the 'men of science': William Henry Fox Talbot exhibited his photogenic drawings at the Royal Society and at a meeting of the British Association for the Advancement of Science. These organisations provided 'men of science' with social networks and models of authority. Typically, early papers appeared in the *Proceedings of the Royal Society* or in the journals of the bourgeois public sphere: *Edinburgh Review*, *North British Review*, *Athenaeum*, *Art Journal*, *Notes & Queries*—even *Household Words* was a generalist magazine. By the 1860s, the *Athenaeum* showed little interest in photography and *Notes & Queries* had been supplanted by the 'Notes and Queries' section of the *Photographic News*. As in everything else, the capitalist division of labour produced increased specialisation in photography.

The earliest recorded organisation dedicated to photography was the Edinburgh Calotype Club, possibly in operation as early as 1841. This amateur organisation had a small membership (mainly legal men) who met over dinner to look at calotypes and socialise. Similar organisations soon sprouted in England: the Photographic Club (sometimes called the Calotype Society), existed by 1847. As a contributor to the *Athenaeum* noted, the Photographic Club consisted of 'a dozen gentlemen amateurs associated together for the purpose of pursuing their experiments in this *art-science*.' The model for these groupings was based on networks of print connoisseurs. Members were to play a prominent role in British photography; among them were artists such as Sir William Newton, and 'men of science' like Robert Hunt. (P. Roberts, 212).

The Great Exhibition of 1851 initiated a transformation in the structure of British photography. An extensive collection of British photographs, and related equipment, were shown; reviews appeared and medals were awarded. However, it was the foreign photographic displays (particularly the French) that drew praise. Many commentators claimed that French photographers outstripped their British counterparts. This argument needs to be treated with caution, because an established discourse suggested that British manufacturers—particularly in the luxury trades—had slipped behind their French competitors. The account of photography circulating around the exhibition meshed with this argument and was, in part, the product of self-serving tastemongers. Nevertheless, combined with the simultaneous foundation of the French *Société héliographique* in 1851 the exhibition provided an impetus to the formation of British photographic societies.

The earliest British photographic society was established in Leeds in 1852. Crucially, in 1853 the London based Photographic Society came into being. The members of the Photographic Club played a significant role in creating this body, with Roger Fenton playing a leading role. The inaugural meeting took place, in 1853, at the Society of Arts—a venue that suggests the Society was modelled on the learned societies. The first Council was made up of twenty-four prominent gentlemen. By June of 1853 Queen Victoria and Prince Albert had agreed to act as patrons (though, it was not until 1894 that it assumed the title of Royal Photographic Society).

During the preparations for the Society, Joseph Cundall proposed an exhibition. Described by Pam Roberts as the first purely photographic exhibition, it opened at the Society of Arts on December 22nd 1852 and ran until January 29th 1853 (Roberts, 215). The first official exhibition of the Society took place in 1854. Thereafter, the Society's exhibition was an important annual event (with the exception of 1862, when it was suspended in favour of participation in the International Exhibition, and 1866). Held at a number of venues over the years, the entrance fee was set at one shilling, though on certain evenings—designated for the 'working classes'—it was reduced to 3d. The pictures were selected by jury and the display mimicked exhibitions of watercolours or prints—photographs in elaborate frames were stacked on the wall; a catalogue was published and extensive reviews appeared in both the national and the photographic press. These reviews provide important sources for judgements on particular images and assumptions about photography.

At least three amateur organisations existed during the

1850s: the 'Photographic Exchange Club' and two groups inside the Photographic Society: the 'Photographic Society Club,' founded in 1856, and the 'Exchange Club of the Photographic Society' (sometimes called the 'Photographic Club'). These organisations existed to facilitate exchanges of images and information between members, but they also provided networks of allegiance and identity. Founded 'to promote friendly feeling amongst members of the Photographic Society,' the Photographic Society Club was restricted to twenty-one members and met five times a year. (Seiberbling, 9–10) In a period when the Society mushroomed, this inner caucus provided the 'amateur' elite with a base for their hegemony. Grace Seiberling has estimated that only forty or so individuals were involved in these clubs. Membership overlapped and those involved were friends and acquaintances; some were relatives. A few of these people were engaged in photography on a professional basis, but these were amateur organisations imitating learned societies and dining clubs (where gentlemen socialised over a meal). According to Seiberling, the rules of the Photographic Exchange Club stipulated two photographic exchanges a year, but only four exchanges took place between 1855 and 1858. (Seiberling, 12) The Exchange Club of the Photographic Society issued two bound albums of members' photographs. The subjects of these pictures—antiquarian images of ancient buildings and monuments, picturesque views, landscapes, and so forth—typify the social vision of the gentleman amateur (Seiberling, 11).

From the outset tensions existed in the Photographic Society between amateurs and professionals. Talbot stressed the organisation should be founded on 'respectable' principles, unsullied by commerce. However, Fenton included professional or 'practical' photography in his vision for the Society. At the first anniversary meeting a motion advocated excluding those who practiced photography for profit. This proposition fell because it would have applied (among others) to Fenton who was Honorary Secretary ('Anniversary Meeting,' 165–66). According to Seiberling this tussle for control continued until 1858 (Seiberling, 73).

Nevertheless, a change was underway. The number of professional photographers in the Society increased substantively as did the range of commercial firms participating in the annual exhibitions. By the middle of the 1860s those involved in the exchange clubs had died or were no longer active in photography. This is not to suggest that there were ever rigid barriers demarcating amateur from commercial work: Talbot patented his inventions and attempted various commercial ventures; in 1853 early amateurs, including Philipe Delamotte and Cundall, instigated the 'Photographic Institution,' which charged for lessons, and sold equipment and prints; in 1856 Fenton, along with others from the Exchange Club, left the Council of the Society to found the commercial 'Photographic Association,' when it flopped he returned to the Society and again played an active role as Vice President. Some early amateurs made the transition to professional photography; others tried to do so but failed.

Shortly after the foundation of the Photographic Society regional groupings appeared. The Liverpool Photographic Society was founded in 1853; the Manchester Society in 1855. Men professionally engaged with photography played a significant role in instigating these organisations in these industrial and commercial cities. But, even in these Northern bastions of capitalism, the key representative roles were filled by local notables. This should come as no surprise: this representative structure mirrors the British state and its colonial extensions. Some societies were short lived (In each case dates are for foundation of the society.): Devon and Cornwall (1854), Norwich (1854), Brighton and Sussex (1855), Birmingham (1856) reformed in 1885, Chorlton (1857), Blackheath (1857), Greenwich (1857) and Macclesfield (1858). The North London Society (1857) and the South London Society (1859) were more stable; as were the Nottingham (1858) and Bradford Societies (1860)**.** With the rise of regionally active groups—the 'parent society'—became known as the Photographic Society of London; then the Photographic Society of Great Britain in 1874.

Special mention must be made of 'British' Societies situated beyond England's borders. Preceded by the Glasgow Photographic Society (1854), the Photographic Society of Scotland was formed in Edinburgh in 1856. Sir David Brewster was elected President; George Moir, previously involved with the Edinburgh Calotype Club was elected a Vice President (though, he stepped down the following year), as was Horatio Ross, a keen amateur and former M.P. for Aberdeen. Prince Albert agreed to act as Patron a month after foundation. The Society held regular meetings at which photographs and items of equipment were displayed and lectures presented; some papers along with the minutes of proceedings appeared in the *Journal of the Photographic Society*. The first annual exhibition was held in December 1856: 1,050 photographs were seen by 8,000 people. The Scottish Society's exhibition was to become a significant annual event. At the second AGM in 1858, membership stood at 151 and was said to include all prominent amateur and professional photographers in Scotland. However, following the establishment of the Edinburgh Photographic Society in 1861, the Photographic Society of Scotland declined, finally folding in 1873. Other Scottish societies included the short-lived Dumfries and Galloway Society (1856) and the Paisley Society (1857). The Glasgow Society became the Glasgow and West of Scotland Photographic Society in 1860.

In Ireland—at this time a part of the British state—

two societies emerged during the 1850s: the Dublin Photographic Society, founded at the premises of the Royal Dublin Society in 1854, and the Belfast Photographic Society, founded 1857, but probably defunct by 1860. The participants in the Dublin Society resemble the figures that made up the London Society: unsurprisingly, many of these people were part of the Anglo-Irish establishment. In a significant move, it changed its name to the Photographic Society of Ireland in 1858. In an empire over which the 'sun never set,' photographic societies were also active in Bombay (1855), Calcutta and Madras (both 1856). Journals were published by the first two societies, but appear not to have survived; the latter published proceedings in the *Madras Journal of Literature and Science* and also held some exhibitions. The social role of these organisations and the images produced by their members were inevitably shaped by this colonial context.

As the South London Society's Honorary Secretary A.H. Wall put it, the range of subjects discussed at meetings:

> are such as, until the introduction of photography, were seldom associated together. The rules of art, the laws of chemistry, the principles of optics, and the secrets of certain mechanical crafts, seem in the non-photographic mind to possess so little in common, that strangers wonder when they hear each, or all, of these dissimilar subjects blending in a discussion following some paper on one or other of the processes of photography. (Wall, 'A Few Thoughts about Photographic Societies,' 487)

Although some of the smaller societies were referred to as 'Gossiping Clubs,' the South London Photographic Society was extremely active and gives an indication of proceedings. Less formal than the London Society, 25 to 30 members gathered to discuss papers or matters of interest. A 'Question Box' allowed issues to be raised 'without writing a paper.' It was suggested that papers should be submitted in advance to the committee in order to prevent presentations that were 'foolish,' 'unsuitable' or in bad taste ('Photographic Societies, Papers, and Discussions,' 147). Evidently, some effort had to be exerted to establish norms of middle-class decorum.

What we know about the societies comes, in large part, from the journals, which carried the minutes of their proceedings and published papers. From the 1850s, numerous photographic journals appeared, often with a short life span. Three stand out: *The Journal of the Photographic Society of London* founded in 1853 (subsequently *The Photographic Journal* from 1859); *The British Journal of Photography* established 1860, but emerged from journals issued in the North West from 1854; and *The Photographic News* (1858–1908). *The Photographic News* was independent (though it was closely allied to the London groupings) and it easily achieved the highest circulation figures. These journals provide indispensable source material, but they need to be read carefully: these are partisan forums for personalities, trends and coteries; all were dedicated to elevating the social status of photographers.

From the outset, photographs were exhibited in a wide range of contexts, including: the British Association for the Advancement of Science, The Society of Arts, The Royal Scottish Academy, The Royal Polytechnic Association, The Photographic Institution, Mechanics Institutes; even the Yeovil Mutual Improvement Society. As we have seen, the Photographic Society and Photographic Society of Scotland mounted annual exhibitions: local photographic societies also held exhibitions on an intermittent basis. Photographs featured in the Great Exhibition of 1851 and in 1857 the Manchester Art Treasures Exhibition included an important collection of photographs selected by Delamotte. Exhibitions of novel subjects began to take place during the 1850s: Fenton's Crimean pictures, for instance, were shown widely around Britain. The 1862 International Exhibition was probably one of the most significant the exhibitions of the period. Following the pattern established in the Great Exhibition of 1851, the commissioners responsible proposed exhibiting photographs and equipment together in the Machinery Court. Photographers were repelled by this suggestion and demanded that their images be exhibited with the Fine Arts. A campaign for reclassification, led by the Photographic Society, was instigated and the national press took note of the argument. As *Punch* observed, the commissioners:

> [h]ave thought fit to pass an insult upon Photographic Art, by classing its productions with railway plant and garden tools, small arms and ship's tackle, big guns, and new omnibuses, donkey carts and corn extractors…. (Silver, 'Fair Play for Photography', 221)

The Society organised a boycott of the exhibition, but eventually accepted the compromise of a 'separate apartment' offered by the commissioners. When the exhibition opened it became apparent that this 'separate room' was a purely notional category in the catalogue; photographs were situated alongside cameras and chemicals amongst an array of educational devices. Despite photographers' evident dismay this exhibition was pivotal, because it pushed photographers to argue on a scale previously unknown that their art was one of the Fine Arts. No doubt, the need to claim invention in copyright law played an important role here, but the existence of networks of professional societies and journals was also significant (in this dispute the *Photographic Journal* received communications from at least nine societies). However, it would be another ten years, before photography was admitted to the category of Fine Art in the International Exhibition of 1872, where it was situated with engraving and lithography.

If the amateur exchange clubs provided one kind of alternative to photographic societies, other organisations also contested for hegemony. Mechanics' Institutes and Literary and Philosophical Societies gave time and attention to photography. During the 1860s James Mudd was a member of both the Manchester Photographic Society and the Manchester Lit and Phil (Photographic Section) were he rubbed shoulders with prominent industrialists and men of science. In 1863 and 1864, responding to the economic crisis in the carte trade, the editor of the *Photographic News*—George Wharton Simpson—advocated the establishment of a 'relief fund' or 'provident society' for photographers ('A Photographers' Relief Fund,' 589). Though little is known of it (probably because historians have been overly preoccupied with the doings of amateur gentlemen) the Solar Club, organised by Simpson, played an important role in the 1860s. Restricted to 25 members, it brought together the '*elite* of the metropolitan photographers' for dinner once a month along with guests from the arts and the press. The model may have been the gentlemanly dining club, but this was no longer an amateur binge. The members of the Solar Club were key figures in professional photography: editors, proprietors of grand studios and writers for the trade journals. At one such meeting the alliance between Alfred Wall and Oscar Rejlander was cemented. There were, of course, also attempts to unionise the industry, though nothing concerted seems to have happened until the early 1890s when Arthur G. Field, Eleanor F. Field and John A. Randall made a determined push for an operatives' organisation.

In his report on the International Exhibition of 1862, published in 1864, Dr Hugh Diamond suggested that there was 'scarce a branch of art, of science, of economics, or indeed of human interest in its widest application, in which the applications of this art have not been made useful.' He offered a list of those who employed photography in their professional pursuits, including: people from medicine, law, architecture and engineering, manufacturers, ethnology, natural history, archeology and antiquarian pursuits. (Diamond, 'Report of Jurors,' 339–46) Lists like this were part of the professional claim to status and shouldn't be taken literally. Nevertheless, photographers increasingly found forms of institutional support by providing the State and private organisations with documents. For example: Fenton, along with the brothers Thurston and Stephen Thompson, worked for the British Museum during the 1850s and 1860s documenting its holdings; penal photography was established during the 1870s and came increasingly to feature as evidence in the law courts; it also came to play an important role in anthropology and colonial administration.

As early as 1859, the need for a permanent collection of photographic portraits was mooted. Lachlan McLaclan took up the idea of a national collection of portraits in 1863. Three years later the Corporation of Manchester adopted his plan and appointed him Honorary Curator. Solicitations for pictures appeared in the photographic press, but, to my knowledge, nothing further happened. In 1882 the South Kensington authorities announced their intention to hold an exhibition surveying the history of photography. The exhibition was to form the basis of a permanent collection at the museum and appeals were again issued in the photographic press soliciting donations of apparatus and pictures. Organised in less than a month and accompanied by a series lectures, this exhibition provided the foundation for the Science Museum collection, and subsequently the nucleus for the National Museum of Photography, Film and Television.

Pictorialism represented both a break and continuity with the established organisations and procedures. The Linked Ring Brotherhood seceded from the Photographic Society in 1892 in order to pursue an untrammelled vision of photographic art. Initially, 28 members were listed on a 'Roll,' rising to 75 at the height of activity. The organisation assembled monthly at a 'Union' for dinner and published *Linked Ring Papers* for circulation amongst the membership. From 1893 it also organised an annual exhibition, or 'Photographic Salon,' which was first held at the Dudley Gallery, Piccadilly, and then at the Pall Mall premises of the Royal Society of Painters in Water Colours. The Linked Ring retained many of the existing organisational forms, but infused them with the imagery and values of the Aesthetic Movement and the Arts and Crafts Guilds. However, Pictorialism was not confined to the elite associated with the Linked Ring: *Amateur Photographer,* a journal peddling a softer version of the Symbolist aesthetic, appeared between 1884 and 1918, and Pictorialism permeated the new amateur hobbyists clubs that developed during the later years of the century. It has been suggested that the number of photographic societies had declined substantially by 1880; in 1885, H. Baden Pritchard listed 17 societies in England and Scotland. (Pritchard, *Photography and Photographers*, 101) By 1900 this figure has risen spectacularly to 256. As Peter James has noted, attention to Pictorialism has largely overshadowed the emergence, around 1890, of the Record and Survey Movement. (James, 'Evolution of the Photographic Record and Survey Movement,' 205). Instigated by Sir Benjamin Stone and W. Jerome Harrison a local survey was initiated to document disappearing monuments, traditions and old buildings in Warwickshire. Other local surveys were undertaken and Harrison attempted to found a national organisation, but he ran foul of the Photographic Society. Stone, by this time Conservative M.P. for Birmingham, established the National Photographic Record Association in 1897, which produced

thousands of images. Despite their divergent aesthetic approaches, Pictorialists and the survey groups pursued a largely anti-urban vision.

STEVE EDWARDS

See also: Talbot, William Henry Fox; *Notes and Queries; Photographic News (1858–1908)*; Edinburgh Calotype Club; Hunt, Robert; Société héliographique; Victoria, Queen and Albert, Prince Consort; Photographic Exchange Club and Photographic Society Club, London; Delamotte, Philip Henry; Rejlander, Oscar Gustav; Royal Photographic Society; Fenton, Roger; Great Exhibition 1851; Cundall, Joseph; Royal Society, London; Brotherhood of the Linked Ring; Photographic Salon, London; Wall, A.H.; South Kensinginton Museum.

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SOCIETIES, GROUPS, INSTITUTIONS, AND EXHIBITIONS IN THE UNITED STATES

The development of photography in the United States has often been described as a "pell-mell rush," to quote Albert Sands Southworth's 1871 evocation of the beginnings of American photography: a spontaneous competition, in which academic institutions and formal organizations played little role. Although this characterization is to some extent true, the organizational history of American photography deserves attention, especially since it reveals, throughout the 19th century, a consistent ambition to elevate the status of photography.

During the 1840s, the development of the daguerreotype was largely autonomous and uncontrolled, as trade organizations did not yet exist and academic institutions played only a limited role. In the United States, the first announcement of Daguerre's invention was not carried by a scholarly publication, but rather by dozens of newspaper reprints of a letter by Samuel F.B. Morse, describing from Paris the "results" of the daguerreotype. The decentralized structure of the United States was

mirrored in the way daguerreotype experiments and then businesses popped up in virtually every settled area, the main economic and cultural centers merely leading the way. For most of the 19th century, and despite some important exceptions, federal departments and especially Congress were quite timid in promoting the use of photography, and were even more so in creating conservation and evaluation instruments. Yet the contrast that some historians have drawn between an "academic" Europe and an "entrepreneurial" America must not be overestimated. No existing American institution in 1839 would have had the power, the authority or the design to influence the course of photography in any way comparable to European policies of protection and promotion. An exception may be made for the U.S. Patent Office, which granted between 1842 and 1862 at least fifty patents concerning mostly minor improvements on the daguerreotype, but whose action was of necessity limited to the realm of technology and even then was often contested or disregarded. Beyond this, however, many academic institutions participated in their own way in the development of the daguerreotype. In many parts of the United States, universities and medical schools served as the first centers for information and experimentation, and this was no less true in the major cities. In Philadelphia—America's old capital —, the Franklin Institute was called upon to evaluate Daguerre's process, and shortly published an "explanation" and then an English translation of Daguerre's manual, while in May 1840 the American Philosophical Society was shown portraits of its members, produced through technical improvements on Daguerre's instructions which, based on experiments by chemists from the University of Pennsylvania, came to be known as the "Philadelphia method." In New York, the leading role that Morse and John W. Draper played in the first months reflected their connections to both New York University and Morse's National Academy of Design, the latter a mutual aid society, rather than a formal tribunal of art. Although other groups existed in New York without any such affiliation, and although the Morse-Draper group was short-lived and mostly informal, it was Morse's authority that drew many apprentices to his studio for lessons in daguerreotypy (among whom were Mathew B. Brady and several other future photographic greats). Finally, associations in the larger cities often held fairs where daguerreotypes were exhibited, the most important of these being the American Institute's fair in New York, which awarded medals for daguerreotype from 1840 on, Mathew Brady receiving his first medal there in 1844 and his first gold medal in 1849.

Between 1850 and 1855, increasing competition, signalled by price wars and various attempts at controlling the market through patents, and compounded by the emergence of the new negative processes, caused a great deal of tension in the profession and led to the formation of "protective" or "mutual" organizations. The most famous of several patents that were awarded, with little or no justification, for secondary improvements on the glass processes was the "bromide patent," covering an accelerating formula for collodion on glass, which was one of three granted in 1854 to James A. Cutting, and which virtually enabled him to control the entire sector of glass photography, causing bitter corporative feuds. Along with the anti-patent and price wars, another concern that initially and durably underlay trade organizations was the desire to "elevate" photography, which meant both to expand its uses and to legitimize it as a form of art. These factors merged in the formation in 1851 of the first two American photographic societies: the New York State Daguerrean Association, which aimed primarily at setting floor prices and creating a "fraternal" spirit in the profession; and the American Daguerre Association, whose first secretary was Samuel D. Humphrey, editor of the world's first specialized periodical, *The Daguerrean Journal* (founded 1850). Humphrey's goal was to promote taste in photography and counter its "humbug" reputation. Neither one of these early photographic societies survived for more than a couple of years, and, by 1852, a third one appeared in New York on a similar platform of mutual aid. In these early efforts to organize the profession and more generally to "elevate" photography's dignity one must also include the photographic competition at the New York Crystal Palace Exhibition in 1853, the first World Fair in the United States, where daguerreotypes still dominated in numbers but were outraced for the top award by photographs on paper.

In the decade between 1859 and 1869, as the daguerreotype was definitively supplanted by glass photography, several more attempts at organization betrayed the same protective impulse. In New York in 1859 the American Photographical Society (APS) was founded; it was later renamed the Photographic Section of the American Institute. Among its founders were some of American photography's pioneers, such as Henry Hunt Snelling, Charles A. Seely, John Johnson and Joseph Dixon, but relatively few active photographers. Indeed, this society aimed at placing American photography "in a position equally as elevated as in Europe," as Seely put it, and therefore it called rather on scientists (such as John W. Draper, Lewis M. Rutherford, Robert Ogden Doremus), and, in William Welling's words, "some of the foremost business, professional and social leaders of the day." The APS discussed technical novelties and scientific discoveries, but also various applications of photography and even photography's past, some members tossing around the idea of a photographic museum in New York. In these various aspects, the APS echoed changes in the social and cultural status

of photography in the United States. This was indeed the period in which, thanks to collodion photography, large organizations, especially federal departments and services, but also railroad conglomerates, museums and academic or scientific bodies, started to devise large-scale undertakings of documentation, archiving, map-making and illustration : hence the role of photography in the Civil War, and especially the connection of the Union's Army of the Potomac with Mathew Brady's staff of war photographers, but also Joseph Henry's precocious organization of photo-ethnographic collections at the Smithsonian Institution, and the systematic inclusion of photographers in federal surveys of the West after 1867. Another trend was the emergence of amateur photographers (or amateurs of photography) and local photographic societies. The most important of these was the Photographic Society of Philadelphia, which was founded in 1862, and which drew amateurs and professionals, including major figures such as Coleman Sellers and Edward L. Wilson, editor from 1864 on of the *Philadelphia Photographer*. This periodical continued the goal of "elevating" photography by promoting serious technical innovation and artistically informed discourse and practices. The strength of the Philadelphia connection was reflected in the Centennial Exhibition of 1876, whose large photographic section displayed in Philadelphia what Robert Taft called "the highwater achievement of the American wet plate photographer," as well as the first large-scale confrontation of American and European photographs in the United States before 1895.

Meanwhile, the protective spirit of the earlier daguerrian societies was far from extinct in the profession itself. The ongoing battle against patents was topmost on the agenda of the Photographers' Protective Union, which convened several times in the 1860. The matter finally came to a head in 1868, when in an effort to fight an application to renew the Cutting patent, a National Photographic Convention was held at the Cooper Institute. At this important event virtually all the great names of professional photography and the photographic industry were gathered (including Mathew Brady, John A. Whipple, Henry T. Anthony, Alexander Hesler, James F. Ryder, John Carbutt, etc.), united in a drive to obtain the repeal of the patent renewal. The patent was indeed revoked, and there ensued a new, "fraternal" organization, the National Photographic Association (NPA), which convened for the first time in 1869 in Boston, inaugurating a period of greater stability in the profession. At this convention a large exhibition displayed the state of the photographic art, including photographs made from retouched negatives, and announcing a trend that might be labeled "professional art photography," and which would characterize NPA exhibitions and American professional photography in general until 1900. In 1870, in the same protective spirit, the NPA defended a copyright for photographers, obtaining a provision in the 1870 law that granted copyright to photographs on the condition that two copies be sent to the Library of Congress (the single most important source of that institution's photographic collection). In the 1870s the NPA became the principal photographic organization; its membership exceeded 1,000 and included such prestigious figures as Samuel Morse, Oliver Wendell Holmes, and Hermann Vogel; it held large annual conventions and exhibitions, and pursued a very eclectic agenda, from patent discussions to artistic retouching to the esthetics of landscape to the historiography of early American photography. Although the NPA came to an early death in 1876 as a result of internal dissent, it was more or less revived in 1880 by the Photographers' Association of America (PAA), which essentially continued the former society in its membership, its "fraternal" ambition to elevate taste and quality and to combat price-cutting—a goal that became vital in the face of growing dry-plate companies and nascent popular photography—and in its genteel commitment to art, which as Sarah Greenough has noted, may have been innovative in theory, but was rather conventional in practice. Thus, it could be argued that from the first daguerrian associations to the PAA's continuing fight for "art photography," the mainstream of American professional photography consistently upheld the same agenda of resisting the more brutal forces of business and industry and promoting photography as art.

After 1880 and even more so after 1890 the structure of American photography changed, in response to the advent of popular photography and perhaps more directly to the growing ranks of self-conscious amateurs, whose clubs and societies numbered over 50 in 1890 and over 150 in 1895. This evolution was also reflected in the increasing number of photographic exhibitions and galleries. A Society of Amateur Photographers of New York held its first annual exhibition in 1885, and in 1887, along with its Boston and Philadelphia counterparts, it started holding Annual Joint Exhibitions that gathered vast amounts of photographs, still with a view to raise standards of taste and quality. In 1896 a photographic salon was held in Washington, D.C., at the Smithsonian Institution, and the following year this was enlarged into a "National Photographic Salon," with the Smithsonian Institution pledging to buy the best photographs. Also in 1897 a large salon was held in Pittsburgh. The National Academy of Design housed its first exhibition of photographs in 1898, and the same year a full-fledged European-style photographic salon was staged at the Philadelphia Academy of Fine Arts, which displayed over 200 photographs by 100 photographers. The Eastman Kodak Company itself created clubs and exhibitions for the promotion of artistic ambition within the

ranks of popular photographers. Thus, when Alfred Stieglitz formed the Photo-Secession in 1902, the institutionalization of fine art photography (and pictorialism) in the U.S. was so advanced that the issue was no longer to "elevate" photography, but rather to strip it of both its professional and amateurish connotations, which over half a century had jointly and consistently amounted to a code of photographic correctness.

François Brunet

See also: Southworth, Albert Sands, and Josiah Johnson Hawes; Daguerreotype; Daguerre, Louis-Jacques-Mandé; Brady, Mathew B.; Cutting, James Ambrose; Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); Snelling, Henry Hunt; Whipple, John Adams; Kodak; and Pictorialism.

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SOMMER, GIORGIO (1834–1914)

Italian photographer

Giorgio Sommer was born at Frankfurt am Main on the 2nd of September 1834. His parents were Georg and Anna Margaretha Gauff. His father had been the proprietor of a famous hostelry since 1826 and was able to give his growing family a certain measure of comfort. Later, however, he lost everything because of gambling and was forced to put his eldest sons to work to support the family. Thus Giorgio Sommer, the ninth of a very large family, served his apprenticeship in the firm of Andreas and Sons in Frankfurt until 1853. Immediately afterwards he started working professionally as a photographer.

In 1857 he went to Italy, first to Rome and then to Naples, where he chose to take up permanent residence. He went back to Rome in 1859 to keep up his acquaintance with his fellow-countryman Edmondo Behles (1841–921), with whom he had formed an association as soon as he had arrived in Rome. This acquaintance lasted until about 1866. Behles was the most brilliant and most qualified cameraman in Sommer's firm, and even today it is difficult to tell his work from that of Sommer's, since the earliest photographs of both do not indicate copyright.

Behles remained in Rome when Sommer set up in Naples, and worked independently until 1878 in Via Mario dei Fiori 28. Both Sommer and Behles in their new premises sold photographs taken in Rome under their own names while they were working together. This made the attribution of the studio's first photographs very difficult. The years spent in Rome were very fruitful ones for Sommer however and it was there that he put his experience to the test and he made contacts that helped him to consolidate and enlarge his own visual capacity. Rome was the meeting place of artists and intellectuals from all over Europe, the goal of a cultured elite of travellers, and the seat of academies and cultural institutes of different countries. There gathered some of the most eminent photographers, such as James Anderson (1813–1877), Angelo (1793–1858) and Giacomo (1819–1891) Luswergh, Robert MacPherson (1811–1872), the calotypists who gathered around Frédéric Flachéron (1813–1883) of the "Roman school of photography." Of these the most famous were Eugène Constant and Giacomo Caneva, who were often to be found at the famous "Caffè Greco" in Via Condotti. Also in Rome at that time there were many other German photographers, such as Wilhelm Osvald Ufer, Gustav Reiger, Michael Mang and Alfredo Noack. In Rome, Sommer and his fellow-countrymen pursued their interest in archaeology and the ancient world, and often met at the Deutscher Künstlerverein or in Palazzo Caffarelli. They loved the beauties of the Italian countryside and of Italian art, thanks to the return of Classicism and its myths, which were much transformed and "revisited" at a symbolic level. Such a passion for antiquity was nourished at the time by the finds at the excavations around Rome and Naples.

Of Sommer's work at Rome there remain several views and his complete set of photographs of the works of art in the Vatican, especially of the ancient statues of Braccio Nuovo, the Museo Chiaramonti, the Museo Pio Clementino, the cabinet of Pope Pius the VIth, the Rooms of the Muses, the Rotonda and the Candelabra. When he was at Rome, his preferrence was for stereoscopic formats and *carte de visite*, which he abandoned after the 1860s, and for "Medium" (21 by 27 cms) and "Large" (28 by 38 cms) photographic apparatus.

At Naples there were many foreign photographers and artists, such as George Conrad, Roberto Rive, Alphonse Bernoud, and Wilhelm Weintraub. Here Sommer set up

his studio most strategically in the centre, although he changed his address several times. Once his association with Behles had come to an end, between 1873 and 1874 he established himself finally in a palazzo in the piazza della Vittoria, where he stayed until he died on the 7th of August 1914. At the end of the sixties his studio was one of the foremost in Naples, which enabled him to live in considerable ease.

Of the photographs he took while at Naples there remain some extraordinary views of ancient ruins, of the excavations at Pompeii and Herculaneum, of the beauties of nature and of monuments, as well as some pictures of Neapolitan dress. Thus he continued to produce the type of work he had experimented with at Rome. He worked for commission, and free lanced at the same time to increase his own individual collection.

In 1862 he abandoned portraiture and began looking at the everyday life of the people of Naples, took photographs of their costumes and of produced genre scenes. From the numerous photographs of trades at Naples which he produced in his studio from the end of the sixties a fine cultural connection can be seen with the tradition of engraving and the eighteenth century Neapolitan tradition of the crib. However, he did not portray the real miseries of man's existence, but by restoring a degree of humanity gave somewhat picturesque view of life and sold his photographs as souvenirs to middle-class and aristocratic tourists who were looking for traditional scenes of a Neapolitan popular character. Indeed, there is no hint of the social conflicts that were typical of the period. In the nineties Sommer began to specialize in instant photography, using the new gelatine silver bromide process. These photographs, which show ordinary people in an everyday context, have an immediacy that reveals the changed priorities of the photographer, and can be seen as the forerunners of social reportage.

Perhaps at the commission of the great archaeologist John Henry Parker he photographed ancient works of art, in particular those at Pompeii and those in the Museo Nazionale at Naples. His views of landscape, both in Italy and in other European countries, are distinguished by their descriptive clarity and precision of detail. Their extremely high quality is due to the use of gold toning, which gives the prints fine gradations of tone from red and purple to violet. His great skill in composition is shown by the fact that, through a slight deviation from frontal and symmetrical shots, his photographs of monuments and architecture are always dynamic and never static.

His studio became very well-known also abroad, thanks to clever distribution and advertising techniques that gave him sales outlets at Vienna, Genoa, Venice, Florence and Palermo. He also had prestigious commissions in the world of art publishing, such that for the work by Domenico Benedetto Gravina published in 1859 *Il Duomo di Monreale illustrato* [*Illustrations of Monreale Cathedral*]. His remarkable entrepreneurial and organizational skills helped him to set up a strong network of collaborators, and his versatility of character and gifts enabled him to interpret successfully the different roles of photographer, printer, publisher, and distributor. Exploiting the growing taste for antiquities, he also started producing objects of art in bronze, terracotta, and marble, copying in particular originals of Pompeii. He won prizes for this, in addition to prizes for photography, at the international exhibitions at London (1862), Paris (1867), Vienna (1873), and Nuremberg (1885). In 1865, together with Behles, he received a signal honour from Vittorio Emanuele II, and from then on his style and title was that of Photographer of His Majesty the King of Italy.

He made many journeys abroad, especially to Switzerland, where, thanks to his reputation, he gained from 1880 to 1890 a commission from the Swiss government to photograph the mountains in connection with the extension of the railway network. Thus his last years were ones of flourishing activity, affluence, and fame also beyond the Alps. However, the extraordinary quality of his photographs mark him out as the photographer who above all definitively captured the life, the monuments, the natural and artistic beauties of Naples, Pompeii, Herculaneum, Amalfi, and all the region of Campania, rich in history, art, and tradition.

Sommer's firm was officially wound up in 1916, two years after his death. The plates were given by a nephew to Bruno La Barbera and were then destroyed.

Today there are many of Sommer's photographs in public and private collections, both in Italy and elsewhere.

SILVIA PAOLI

Biography

Giorgio Sommer was born at Frankfurt am Main on the 2nd of September 1834. His parents were Georg and Anna Margaretha Gauff. He was the ninth of a large family, and had to earn his own living from an early age because of economic difficulties. He was apprenticed to the photographic studio of Andreas and Sons and at the end of his apprenticeship he decided to work professionally. He began to work in Italy in 1857, at first in partnership with Edmund Behles, and from 1866 on his own. His first studio was in Rome, but almost immediately he decided to settle in Naples, where he changed his address several times (Strada di Chiaia 168, Via Monte di Dio 4 and 8, Piazza della Vittoria). He travelled widely in Italy and abroad, either for his own private work or on commission. His main interests were photographing views of archaeological sites and

of the natural and artistic beauties of Naples and its bay, of Pompeii and Herculaneum, and of the Amalfi coast, and taking photographs of Neapolitan costumes. For a short time he did portraits, but stopped in 1862. In 1861 at Naples he married Antonia Schmid, the daughter of a piano maker; they had two children, Edmund and Carolina. Edmund worked in his father's firm and on the 21 of January 1889 became a partner. The firm won prizes at international exhibitions: London (1862), Paris (1867), Vienna (1873), and Nuremberg (1885). In 1865 Sommer was honoured by Vittorio Emanuele II as Photographer Royal. He died on the 7th of August 1914 after having achieved great affluence and European fame. Nothing remains of his archive of plates. Today there are only some of his photographs in public and private collections.

See also: Behles, Edmondo.

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SOUTH KENSINGTON MUSEUM

The museum was actually located in the London district of Brompton, where it opened its doors in 1857. However, its founding director, Henry Cole, thought that the made-up name of 'South Kensington' possessed more social tone. The museum was based on an earlier one which was originally part of the Government School of Design and went by various names in the early 1850s, such as the Museum of Ornamental Art. These earlier manifestations were much enlarged in physical plant and intellectual ambition in the form of the South Kensington Museum. This was created out of the cultural impetus provided by the Great Exhibition of Works of Industry of All Nations, held in London's Hyde Park in 1851. The Commissioners of the Great Exhibition spent some of its enormous profits buying 86 acres of land south of Hyde Park. Prince Albert saw this as the site of a new cultural quarter. Henry Cole (1808–82), a prime mover in organizing the Great Exhibition, took control of the Schools of Design and the newly formed Department of Practical Art at the Board of Trade in 1852. The South Kensington Museum became a model for many other museums around the world. The new institution embraced the arts of everyday life and developed vigorous teaching programmes to improve design, craftsmanship and taste. Cole did several important things for photography. In 1852 he began a collection of documentary photographs representing works of art and architecture. Among the earliest acquisitions was Maxime Du Camp's *Egypte, Nubie, Palestine et Syrie,* bought by instalments from 1853 onwards. Secondly, from 1853, Cole commissioned photographs of the museum's temporary exhibitions, so that a record would be available for study when objects had been returned to their owners. Francis Bedford (1816–94) and Charles Thurston Thompson (1816–68) photographed An Exhibition of Decorative Furniture in 1853. In 1856 Thompson was appointed Superintendant of Photography and, assisted by soldiers seconded from the Royal Engineers, established the world's first museum photographic service. The purpose of the service was to record works of art with the new authenticity provided by photography and to make these photographs available at modest prices to the designers and others who needed them. Photographs were often used to illustrate the Museum's catalogues in the era before accurate photo-mechanical printing. Cole's third innovation was to begin a collection of the art of photography. He saw

the medium as a tool of education and scholarship, but also as a creative medium in its own right. (His enthusiasm for photography led him practise it as an amateur in 1856.) On 22 January 1856 Cole and Thompson visited An Exhibition of Photographs and Daguerreotypes, the third annual exhibition of the Photographic Society of London. Cole bought 22 photographs from the exhibition, thus founding the earliest collection of the art of photography in the world. His selection included examples of the principal subjects of fine art, such as the nude (an "Academic Study" by John Watson), still life ("Christmas Fare" by V.A. Prout and William Lake Price's "The First of September") and landscape (most notably views taken in the Valley of the Mole by Robert Howlett). Cole's fourth initiative was to host a photographic exhibition—the first in any museum—in 1858. This was a combined show involving the Photographic Society of London and its Parisian counterpart, the Societé Française de Photographie. There were almost 1000 exhibits, including contributions from some of the greatest practitioners of the time, such as—on the British side—C.L. Dodgson (Lewis Carroll), Roger Fenton, J.D. Llewelyn, Oscar Gustave Rejlander and Benjamin Brecknell Turner and—from France—Edouard Baldus, Gustave Le Gray, Nadar and Charles Nègre. Queen Victoria and Prince Albert, both keen collectors of the art of photography, attended the private view of the exhibition held on 12 February 1858. The installation of the exhibition was admired by critics and was recorded in a photograph by Thompson. Unfortunately, none of the exhibits were acquired by the museum. However, Cole was to make a significant acquisition in 1865 when he bought 80 photographs from Julia Margaret Cameron (1815–79). He sat for her at Little Holland House on 19 May 1865. Cameron produced a striking portrait of Cole, resembling a Renaissance grandee (a print is in the Royal Society of Arts), and gave the museum 34 more of her photographs. Cole showed a selection of Cameron's works at the museum in autumn 1865. He also provided her with studio space for her portraiture practice at the museum—this was (his fifth innovation) a precursor of the idea of the artist-in-residence. Her marvellous letters to Cole are in the National Art Library at the South Kensington Museum's successor, the Victoria and Albert Museum (which it was renamed by Queen Victoria in 1899, now popularly called the V&A). Cole's sixth innovation was to send Cameron's photographs to regional centres as part of the museum's circulating exhibitions programme. He was the first, and unfortunately the only, museum director to buy and exhibit Cameron's work in her lifetime. The works she gave Cole and his wife personally were given to the museum by their son, Alan S. Cole, in 1913. Thanks to the various photographic initiatives introduced by Cole at South Kensington, his colleagues were sufficiently sensitized to the art of photography to accept the photographic element when the Chauncy Hare Townshend Bequest was offered in 1869. The photographs were kept alongside other kinds of prints in the Art Library—perhaps the earliest 'museum without walls.' The museum's scientific experts also arranged important exhibitions which presented photography from a technical point of view, notably The S.T. Davenport Collection (1869) and the Special Loans Exhibition (1876). These exhibitions displayed an impressive range of photographic processes, print types and equipment such as lenses. Items from the1876 exhibition became part of the Science Museum collections when the South Kensington Museum was divided and renamed in 1899 and are now in the National Museum of Photography, Film and Television.

MARK HAWORTH-BOOTH

See also: Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); Du Camp, Maxime; Thompson, Charles Thurston; Bedford, Francis; Royal Engineers; Societé Française de Photographie; Dodgson, Charles Lutwidge; Fenton, Roger; Llewelyn, John Dillwyn; Rejlander, Oscar Gustav; Turner, Benjamin Brecknell; Baldus, Édouard; Le Gray, Gustave; Nadar; Nègre, Charles; Victoria, Queen and Albert, Prince Consort; Cameron, Julia Margaret; and Cole, Sir Henry.

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SOUTH-EAST ASIA: MALAYA, SINGAPORE, AND PHILIPPINES

Malayasia in 2006 comprises in the west: the southern Malay Peninsula (former Straits Settlements of Penang, Province of Wellesley and Malacca), Singapore and in the east, the states of Sarawak and Sabah on Borneo and the Philippines.

Early photography in the British Straits Settlements was concentrated around Singapore the prosperous port built in 1819 by the English East India Company. Munshi Abdullah in his 1849 narrative *Hikayat Abdullah* reports seeing a daguerreotype view of the city—possibly as early as 1841—made by a doctor aboard a visiting American warship. The first resident photographer in the region was the undistinguished French portrait painter Gaston Dutronquoy (c.1800–c.1857) who set up his 'London Hotel' in Singapore in March 1839, installed a photography studio and in December 1843 advertised his services as 'complete master of the newly invented and late imported Daguerreotype' in the *Singapore Free Press*. His practise may have continued till 1849 but may also have been an occasional activity. French customs expert Jules Itier (1802–1877) did succeed in making daguerreotypes in Asia between 1843–1846 while on a business mission to China. Some plates survive including portraits and views from Singapore, Borneo, and Manila made in 1844–1845. Eliphalet Brown Jr. (1816–1886) official photographer on the U.S .Perry Expedition to Japan, seems also likely to have made plates in Singapore in 1853.

The first generation of photographers in Asia were itinerant and the few established studios lasted only a few years; daguerreotypist H. Husband operated in Singapore in1853 then C. Düben from Batavia who had also visited Hong Kong, Shanghai, Macao and Manila, offered superior improved portraits from 1854 until his return to Batavia in 1857 and in May 1855 daguerreotypist L. Saurman also from Batavia, briefly worked out of the London Hotel. Calotype work popular in British India, is unknown in the Straits and Manila.

In the first decades most photographers in the Asia-Pacific region were European but J. Newman based in Singapore from 1856–57, advertised many refinements and "permanence" for the products of his American Photographic Rooms. He made a side trip to Malacca—the first photographer to work on the Malay mainland.

It seems likely that across the Asia-Pacific hundreds even thousands of daguerreotypes were made even in the 1840s. Englishman J.W. Newland for example, travelled west to east from South America via Australia to India and claimed to have made over 200 daguerreotypes on the way. The number of extant daguerreotypes however, is tiny. This paucity appears to apply equally to the succeeding format of cased ambrotype portraits and views.

By February 1858 Edward A. Edgerton was the first professional to introduce photographs on paper to Singapore but moved on to work as an editor by 1861. He was followed by Thomas Hermitage and O. Regnier offering the new wider range of products; both views and portraits and places. The quest for images to send back to Europe where they would be widely disseminated redrawn as graphic illustrations propelled the growth of the views trade. Stereographs led the way and in 1860 Negretti and Zambra in London pioneered publication of Southeast Asian stereographs. They took the bold step of dispatching Swiss photographer Pierre Rossier to China in 1859 and instructed him to go to Manila where he made images of the Taal volcano. The ease of making multiple prints facilitated the production of albums and panoramas extolling the progress of colonial cities. The earliest panorama in the Straits region was a view of Singapore in ten parts made in 1863 by Sachtler and Co. The firm also made one of the first published albums; *Views and Types of Singapore.* From 1864 the firm was run by August Sachtler and Danish- born Kristen Feilberg (1839–1919) and they built an extensive stock of views from across the region including images from an expedition to Sarawak in 1864. Feilberg, operating alone from 1867, had a feel for picturesque views which he exhibited in the Paris International Exhibition in 1867. J.M. Nauta, operated in Penang and Singapore and had branches in Medan, Achin and Sumatra between 1868–1888. He exhibited Penang scenery at the *Colonial and Indian* exhibition in London in 1886.These shows enabled the public to see large format Asian images first hand.

With improvements in exposure times portraiture continued to grow and Royal courts in Asia were in often enthusiastic and discerning users of photography exchanging images with their foreign counterparts. Views trade work soon merged into reportage and Feilberg also recorded events such as the Penang riots in 1867 and later the visit of the British Duke of Edinburgh in 1869. Other events particularly the increasingly fashionable Royal tours by European and non-European rulers and Vice Regal residents were a stimulus to photography in the Asia-Pacific but more strongly it seems in Hong Kong than in Singapore and Malaya.

The outstanding figure of the period for breadth of coverage in the 1860s and model of the 'travel photographer' was Scot John Thomson who set up a studio in Singapore in 1862 with his brother William but spent most time travelling to Penang as well as Sumatra before departing in 1865 for Thailand and Cambodia. He returned briefly to Singapore in 1867 and published his first book *Cambodian antiquities* before settling in Hong Kong where he illustrated a publication on the Visit of the Duke of Edinburgh in 1869.

John Thomson used Indian assistants on his Straits journeys in 1862 as the Chinese would not go near the processing. Chinese (and a few Japanese) photographers however were among the earliest non-European photographers at work in Southeast Asia mainly, Sun Qua in 1867 and Yuk Lee a portrait painter from Canton, who advertised briefly in Singapore in 1861–1862, and Koon Hin had a studio there in 1880. Hand-colouring

however, a distinctive genre in 19th century India and Japan played only a small role in Southeast Asia.

Photography associated with expeditions and government agents was a factor in the 1870s. Professional photographer and painter Austrian Wilhelm Burger (1844–1920) was part of the Austrian mission in Asia from 1869–1870 and later marketed rather prosaic stereoviews of Borneo, Singapore, Sulu and the Philippines. James W.W. Birch (1826–1875) the first British Resident in Perak in 1873 an amateur photographer, who sent views of his tours in Perak and Selangor to the colonial office in 1874 was murdered in 1875. British Major J.F. A. McNair used illustrations drawn from photographs in his 1878 book on Perak and the Malays. His countryman Civil Servant Leonard Wray (1852–1942) a prolific amateur also documented Perak peoples and places in the 1880s–1890s and was much valued for his efforts. In 1883 J.F. Stiehm in Berlin published their "Marine" series including views of Singapore and the Philippines made by Gustav Riemer the purser on the Austrian S.M.S.*Hertha* expedition of 1880.

Established studios become more common in the late 1870s and expanded their inventory of views and also trained a new generation of professionals. Henry Schuren worked for Woodbury and Page in Batavia before settling in Singapore in 1874 and was soon after appointed official photographer to King of Siam, settling there in 1876. From 1883 August E. Kaulfuss (1861–c.1909) worked for J.M. Nauta studio then became a travelling photographer gathering views from all over and was also official photographer to Sultan of Kedah.

The opening of the Suez Canal in 1869 increased trade and tourism through Asia which benefited firms such as that established by G.R. Lambert 1846–after 1886) a professional from Berlin who advertised his services in Singapore in 1867 but effectively commenced in 1877. During 1879–1880 Lambert was in Bangkok taking over Henry Schuren's stock and his position as official photographer to the King of Siam. Lambert left the business operations by around 1886 and the work was continued under Alexander Koch who recorded such ceremonies as the Kuala Kangsar durbar in 1897 to mark the creation of the Federated States of Malaya.

GR Lambert and Company built the most extensive inventory of views of the Malay Peninsula, Borneo and Sumatra including making the earliest images of Kuala Lumpur and covering all major Malayan ceremonies and events and also kept up with new developments in instantaneous and dry-plate photography. The dominance of such large and mass production studios in Asia as elsewhere was checked by the emergence of the snapshot family photographers including the amateur photographic societies of the 1880s–1890s (Singapore Photographic Society was established in 1887) but compensated for in the new century by the profitable postcard craze.

Images of the Philippines were regularly reproduced in British and French magazines such as *The Illustrated London News* from the 1860s but relatively little is known of the earliest photographers. A Spanish Government agent Sinibaldo de Mas took up portrait work in 1841 to earn extra income. Jules Itier was in the Philippines from December 1844–January 1845 (where he surprisingly records buying 25 new plates in Manila) then in Mindanao, Sulu and Basilan until March. A daguerreotype of the Intramuros is the earliest extant Philippine view. Daguerreotypist C. Düben is known to have been in Manila before 1853.

The GBR museum at Cavite holds a daguerreotype portrait of William W. Wood an American who worked in China as a clerk and newspaper editor from 1827–33 before relocating to Philippines in 1833 where he later operated a photography studio in Manila by the 1870s. His own work in daguerreotypy is unclear. The earliest surviving Philippine images on paper include a cdv of two Indio musicians in La Union by Pedro Picon circa 1860; a group of stereographs from an *Oceanie* series with French captions of the Tinguian people of Northern Luzon made in 1860 and a later group of stereos by an unknown photographer of the 1863 earthquake. Swiss born Pierre Rossier was sent to Manila by Negretti and Zambra to photograph the volcano but would have taken other subjects. T.W Bennett also marketed an early stereograph series of views under the Spanish title *vistas filipinas.*

Studios were established in the 1860s benefiting from the increased commercial activity in the region. From the mid 60s until his death in Manila in 1874 the British photographer Albert Honiss sold a wide range of well-composed views to magazine publishers in Europe; any connection to W.H. Honiss in Singapore in 1862 is unclear. The Dutch photographer Francisco Van Kamp who had exhibited in Amsterdam, took over the Honiss studio in 1874 and later produced a set of views of the 1880 earthquake.

Ethnographic subjects were a staple for resident and visiting photographers. The photographers aboard the British Challenger Expedition of 1872–1876 made or gathered a number of photographs of ethnographic and scenic photographs in Manila and the archipelago in 1875. William Wood made ethnographic cdvs and examples with similar backgrounds appear in Belgian author Jean de Man's 1875 photographically illustrated book *Souvenirs d'un voyage aux Iles Philippines.* In 1881 French ethnologist Alfred Marche (1844–1898) photographed Negritos on his Philippines expedition of 1879–1885 and the photographs were used for illustrations in the journal *Tour du Monde* in 1886. One of the most extensive ethnographic records was

undertaken by German A. B. Meyer (1840–1911) on his own and by use of other photographers work. His *Album von Philippinen-Typen* of 1885 included Luzon and Mindanao people in a mixture of studio set ups and natural settings.

The turbulent revolutionary years at the close of the century also inspired the growth of reportage. Spaniard Manuel Arias y Rodriguez (1850–1924) took up photography in 1892 and ran the Agencia Editorial bookshop at Escolta with his brother Vincente. The firm sold a wide range of photographs of urban and landscape views of the regions but was quietly subversive selling under the counter banned books by nationalist Dr Jose Rizal whose execution in 1896 Manuel photographed. Afterwards Arias took on the role of war correspondent of the Philippine Revolution against Spain 1896–1897 and supplied images to the Barcelona journal *La Ilustración Artística* from 1897–1900. Arias ended up as Spanish ambassador to Tokyo and died there in 1924. Documenting war proved perilous for Francisco Chofré y Olea and Augusto Norris y Olea who were killed in 1896 while photographing during the Philippine Revolution. Their portraits and their photographs were included in two albums on the war *Tristes Recuerdos1896* and *1897* published posthumously by their firm Chofre and Co. in Manila.

The Spanish-American war resulted in American rule in the Philippines from 1898 prompted a flood of illustrated publications including, F. Tennyson Neely's *Fighting in the Philippines: authentic original photographs* 1899, many stereograph series and distinctive solder-portraits wearing their scout-style outfits and striking poses reminiscent of the Old West. James Ricalton (1844–1929) an American teacher who photographed for Underwood and Underwood recorded grisly images of the 1899 casualties (the greater death toll of locals from starvation and disease however, going largely unrecorded).

GAEL NEWTON

See also: Woodbury, Walter Bentley; Itier, Jules; Castro Ordóñez, Rafael; Lambert & Co., G.R.; and South-East Asia: Thailand, Burma and Indochina (Cambodia, Vietnam, Laos).

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SOUTH-EAST ASIA: THAILAND, BURMA, AND INDOCHINA (CAMBODIA, VIETNAM, LAOS)

In his memoirs French trade negotiator Jules Itier (1802–1877) describes making two daguerreotypes at the French military fort at Tourane (Da Nang), South Vietnam, in 1845 while on a trade mission to China. Activity by other daguerreotypists in Burma or Indochina is as yet unknown. The response to photography in Thailand (Siam) was however, precocious due to the enthusiasm for the medium in the Royal Court.

In Bangkok in July 1845 French Bishop Jean-Baptiste Pallegoix (1841–1862) received an apparatus he had ordered from France and he and his confreres became adept enough to take Royal portraits and train others. With no tradition of Royal portraiture in the late 1840s and 1850s King Mongkut (Rama IV) had many photographs of himself and court made to mirror European portrait photographs received as gifts and which he returned in-kind. A practise continued even more assiduously by his son Rama V, King Chulalongkorn. Locals and members of the court also acquired photography skills (details are in various Thai histories as yet not available in English). Luang Wisut Yothamat (Mot Amatyakun) the Director of the Siam Mint, made portraits of the Royal couple using a daguerreotype camera sent by Queen Victoria to the King in 1856.

Access to the Thai Royals was granted to foreign photographers including Swiss Pierre Rossier (on assignment in Asia for Negretti and Zambra of London) who was in Bangkok in 1861 and made ethnographic studies and a Royal portrait for Firmin Bocourt a French zoologist and illustrator in Thailand on a naturalist expedition.

Bishop Pallegoix or French priests probably trained the Thai-Christian Khun Sunthonsathitlak (1830–1891) who began photography in the late 1850s, worked for the technologically-minded dual monarch Phra Pinklao, before opening his own studio in 1863 under the name

'Francis Chit & Co' (later *& Sons*). He was skilled in wet-collodion work and made numerous portraits, views and records of events including a large panorama of Bangkok in 1864. In early 1862 Isidore van Kinsbergen (1821–1905) the official photographer accompanying a Dutch delegation visiting from Batavia, made a range of views, portraits and studies of antiquities. Wilhelm Burger (1844–1920) a professional photographer attached to the Austrian diplomatic and trade mission was briefly in Bangkok in May 1869. He later marketed stereoviews of his travels to Vietnam and Japan. Francis Chit & Co photographs were regularly bought by visitors but most ended up uncredited when shown or reproduced in Europe.

A number of ambitious artists also went to Southeast Asia;. John Thompson (1837– 1921) after his first few years as a photographer based in Singapore in 1861–1864, transformed into a freelance 'travel' photographer and set off for Bangkok where in 1865 he photographed King Mongkut and his court as well as other subjects before travelling to his real goal—the fabled Angkor Wat temple complex in Cambodia in early 1866.

Chit and Co outlasted foreign competitors attracted to Bangkok such as Henry Schuren who visited from Singapore in 1874 and gained a Royal 'Appointment' (it was never an exclusive honour) then set up in Bangkok in 1876 but was replaced in 1879 by G.R. Lambert from the flourishing Singapore firm, who made a lengthy visit to Bangkok that year. British photographer William K. Loftus worked in Bangkok from 1887–1891 but his work was rather dull.

Increasingly from the 1860s illustrated magazines used photographs as the basis for illustrations and received images and stories from 'world tours' undertaken by a broader range of travellers facilitated by the improved travel routes and methods, modelled in some cases on the new 'Royal tours' undertaken by European and Asian kings and courtiers. Populist illustrated traveller's tales also flourished. The buoyant young French attaché Ludovic, Comte de Beauvoir for example, collected photographs assiduously in 1865–1867 on a tour with a French Royal, and used these as the basis for illustrations in his best selling books which began in 1869, with *Java, Siam, Canton : voyage autour du monde*.

Burma [Myanmar]

After three Anglo-Burmese Wars beginning in 1824, from 1886 north and south Burma were conquered and administered as part of British India. The last Burmese Kings, Mindon and Thebaw (prior to his exile in 1886) were photographed and later had court photographers but no daguerreotypes are known and the earliest extant photography in Burma is connected to British military expeditions. In 1853 East India Company Surgeon John MacCosh (1805–1885) an experienced amateur photographer, made views and ethnographic portraits while on duty in Burma during the Second Anglo-Burmese War but his work had limited circulation. By contrast, in 1855 Captain Linnaeus Tripe (1822–1902) posted from Madras as the official photographer to the well equipped Indian Government diplomatic mission to King Mindon's remote northern court at Ava. Tripe executed some 200 large paper negatives which concentrating on structures and topography, have an eerie empty stillness and were used as the basis for illustrations in the official *Narrative* of the expedition of 1858. More impressive and influential were the massive 120 image portfolios of original prints published under Tripe's authority in 1858 by the Madras Government. Major Williams an engineer and amateur photographer, accompanied the Edward Bosc Sladen expedition through Burma to China in 1868.

Military training in photography was also the path to a new vocation for J. Jackson (with fellow Private Bentley) who established a long running and prolific studio in Rangoon in 1865. Not all newcomers were British. The German professional photographer Philip Klier (1845–1911) began work in 1871 in Moulmein, lower Burma then at Rangoon where he was in partnership with J. Jackson in 1885–1890. His output was high in quality and extensive and represents the consolidation of the mass-market views trade over the 1880s–1890s—a world wide trend.

Lieutenant-Colonel Willoughby Wallace Hooper (1837–1912) on the British Expeditionary Force during the Third Burmese War produced a set of one hundred images in 1887 which he declared 'were taken entirely for his own amusement and from love of the art' as did Colonel Robert Graham (1838–1918) with his photographically illustrated book on the War released in 1887. Captain-Surgeon Arthur George Newland (1857–1924) published his *The image of war, or Service on the Chin Hills* with fine gravures in 1894.

Perhaps the earlier Burmese War publications scotched the plans of the Italian born Felice Beato (1825–1907) who arrived in Rangoon in 1886. He had made a name in war photography in India in 1858 and China in 1860 and for his prolific Japanese scenes and types over his long years there in the 1860s–1870s. Beato stayed on and set up a studio in Mandalay producing some war related scenes and studio tableaux of Burmese Beauties. He also travelled into the inner region and produced a substantial but now lesser-known body of work. By 1895, Beato had expanded into a quite large photography, furniture and artefacts manufacturing and postcard business. He employed a number of local photographers including in particular H.N. Samuels who wife and daughter apparently modelled local costumes in the Beato studio portraits of local 'types.'

The boom in Burma induced regional studios to set up branches; Frederick Skeen of Skeen and Co in Ceylon (Sri Lanka) arrived in 1887 to set up a branch and worked as Watts and Skeen. The work of the 1880s generation benefited from the introduction of the faster and more convenient dry-plate which allowed for more varied and lively subjects and atmosphere. The firm may have sold Beato material in Ceylon and their inventory seems to have been taken over by Beato after Skeen returned to Ceylon in 1903. Studios based in India also sent representatives including the well-known firm of Bourne and Shepherd.

Anthropology a new science also became codified and politicised in the 1860s and a number of uncredited photographers provided ethnographic images from Burma to the multi-volume *Peoples of India* publication of 1868–1875. Guidelines for scientific anthropometric studies were developed in the late 1860s following strict guidelines but these were rarely implemented. Some ethnographic studies were in fact more like early forms of pin-up girls and the fine-looking Burmese women in their restrained elegant costume proved especially appealing to European taste. A more sympathetic eye and ethnographic interest came from Sir George Scott who took up photography in 1888 and published a set of volumes on the Shan States.

Cambodia

The great abandoned temples of Cambodia, at times under Siamese control, were to become the 'pyramids' of Asia. John Thomson was inspired to visit Cambodia after reading the 1864 English edition of French explorer Henri Mouthot's *Travels in the Central Parts of Indo-China (Siam), Cambodia, and Laos, during the Years 1858, 1859, and 1860* which popularised the ruins. Illustrations after photographs in that (posthumous) book and the *Tour du monde* accounts of Muhout's travels 1868 were not by Mouhot but local photographers including Francis Chit. Thomson was not the first photographer at Angkor; his companion in 1867 British consular officer W.G. Kennedy had visited and taken photographs in 1856, but none are known to survive. Thomson was the first skilled technician and superior camera artist to make images there. His lively accessible prose ensured the success of his own first book of 1867 *Antiquities in Cambodia* illustrated with 16 original prints. His later publications were more widely disseminated as they had photomechanical illustration. The Cambodian work was also Thomson's entrée to the learned societies of his homeland. Thomson returned to Saigon and photographed the Royal family there before returning to Britain.

Soon after Thomson's work at Angkor French military trained photographer Émile Gsell (1838–1879) was at work there in late 1866 with the French Mekong Exploring Expedition initiated and later led by Francis Garnier**.**

Typical of the many French military come civil servants and administrators who became passionate advocates for Asian culture was naval officer Louis Delaporte (1842–1925) on the French Government Mekong expedition which visited Angkor in 1866. He sought help from Thomson and Gsell and perfected his own photography for his later 1873–1874 expedition to Cambodia with F.C. Faraut, seeking constant improvement in architectural work through use of aplanar lenses and gelatin processes. He exhibited at the 1878 Exposition Universelle in Paris His interest came from his passion for archaeology and Khymer culture for which he helped found a Musée Indochinois du Trocadéro .

The French tradition of the centralised grand scale cultural and scientific 'mission' meticulous and methodical was exemplified in the Mission Pavie teams of photographers.Delaporte sent Louis Fourneau on expeditions 1886–88 in which Captain Malgraive and Riviere also where made plates successfully at Angkor. The remarkable Jean Marc Bel and his wife an engineer made many voyages 1893.

International and local exhibitions formed a significant platform in the later 19th century to promote the colonial endeavours and as self promotion for photographers.

Vietnam and Laos

The French had a presence from the 1840s in Vietnam then known as Cochin China in the south and Tonkin in the north, and, as with the British in Burma, their control extended from the mid-1860s through various conflicts until effective control of Tonkin as well as the south came in 1885. Not surprisingly, French photographers were first to appear in Saigon (Ho Chi Minh City): Charles Parant in 1864–1867 and Clément Gillet in 1865–1866. After his Mekon Expedition work, Emile Gsell went private and set up a studio in Saigon in 1866 becoming first long-term commercial photographer in Vietnam. Gsell however, also left Saigon in 1873 to join Louis Delaporte's expedition in Cambodia revisiting Angkor Wat. Gsell Angkor Wat pictures and panoramas earned him a medal at the Vienna International exhibition of 1874 where he also Cambodian and Vietnamese ethnographic studies. In 1876–1877 Gsell was also able to travel in north adding images of Tonkin to his stock which passed to other studios in Saigon after his early death in Saigon in 1879.

John Thomson returned to Asia in 1867 spending some months in Saigon and surrounds even trying to capture clouds without montage suggesting he may have been using a new process. He sent articles to *The China Magazine* but his Saigon work was not included

in his 1875 book covering his *The Straits of Malacca, Indo-China and China, or, Ten years' travels, adventures and residence abroad*.

As elsewhere in Southeast Asia, photographers migrated to new markets opned up by colonisation. M. Martin from Singapore was noted for fine landscape views in the 1880s. The Chinese diaspora reshaped many communities in Southeast Asia; Pun-Ky marketed cdv portraits of Annamite (Vietnam) types probably from the 1870s as did Pun-Lun who had worked in Hong Kong had a studio in Saigon (opposite that of Gsell) from 1869–1872. A rare Vietnamese name appears; Dang Huy Tru, a retired Mandarin who learnt photography while in China, had a studio in Hanoi from 1869 until the French occupation of 1873. He is claimed to have attracted Vietnamese clientele and developed a style of pose based on ancestor portraits but such posing was common to costume portraits and types across Southeast Asia. Other Vietnamese names do not appear although in 1896 Cam Ly was in business in Hanoi. By the 1880s Chinese-born photographers were at work in most regions chiefly in portrait work. Few of their archives are identifiable but some more substantial commissions survive such as the photographs of the French railway constructed from 1889–1897 between Hanoi and Lang Son which executed by Tong Sing. Yu Chong had a studio in Hanoi in 1893–1900.

A number of Europeans in service in Asia became interested in not only the culture of the past but had a feeling for the life of the contemporary peoples. Like so many men attached to the military abroad, Doctor Charles-Édouard Hocquard (1855–1911), who was on service in Tonkin in 1884–1885 in the Franco-Chinese War, published his photographs officially and privately. His field report on the war illustrated with Woodbury types was subtitled '*customs and beliefs of the Vietnamese*, and was, serialised as 'Trente mois au Tonkin,' in *Le tour du monde,* 1889–1891. Aurélian Pestel (1855–1897) took up photography in Saigon in 1892 having arrivied in Vietnam in 1883. He was also noted for showing the customs of the country beyond studio enactments.

The new generation rising in the late 19th century but coming most to the fore after 1900 in the early decades of the 20th century, looked beyond hard objects to lifestyle and customs, including Sub Lieutenant Étienne Francoise Aymonier (1844–1929) in the French Marine infantry in Saigon who learned the Cambodian and Vietnamese languages.

The image of Southeast Asia was shaped and defined by early photographers and the legacy inherited revolved around a nostalgia as well as scholarly pursuit of antiquities. Photomechanical reproduction in photogravure, carbon, and woodburytpe created a new industry at the turn of the century of which a former soldier sent to Hanoi in 1885, Pierre M. Dieufils of Saigon, is one of the best knownt. His distinctive landscape folio publications were typical of the late 19th and early 20th century mass-produced works.

GAEL NEWTON

See also: Burger, Wilhelm Joseph; Chit, Francis; Itier, Jules; Thomson, John; and Expedition Photography.

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SOUTHWORTH, ALBERT SANDS (1811–1894) AND HAWES, JOSIAH JOHNSON (1808–1901)

In 1840, the daguerreotype exploded onto the American social scene. Thousands took up the business and even more the sitter's chair. Yet with primitive technology, erratic rewards and intense competition, professional survival was difficult. Albert Sands Southworth and Josiah Johnson Hawes epitomized the talents needed to succeed in the chaotic early years of photography. Coupling ingenuity and expertise with great patience and hard work, their partnership was exemplary. Their studio was among the most distinguished and influential in America and their achievement ranks among the most important in nineteenth-century photography. Southworth was a natural promoter and salesman whose restless nature and financial cupidity drove him

to improvement and invention. By contrast, Hawes was a proven artist whose mastery of light, composition, mood and expression was unparalleled. Together, their technological innovations considerably improved the adaptability, application and clarity of the new medium. Likewise, their commitment to art enhanced the standing of the profession and significantly advanced the aesthetics of portraiture and the realism of documentary. Given the daguerreotype's fragile and singular nature, the partnership's legacy is equally remarkable, comprising over 1,500 existent images.

Albert Southworth was born in West Fairlee, Vermont, on 12 March 1811. After attending the Phillips Academy in Andover, Massachusetts, he tried teaching before establishing a drugstore in Cabotville, Massachusetts in 1839. Unhappy with his trade, he attended a lecture early in 1840 on the principles and practice of the daguerreotype. Delivered by François Gourand, a pupil of Louis-Jacques-Mandé Daguerre, the lecture stimulated Southworth and persuaded him to contacted Joseph Pennell, his friend and former roommate at Phillips. Pennell was, at the time, assisting Samuel Morse with his early photographic research and he invited Southworth to New York to participate. Southworth's first-hand experience of Morse's experiments convinced him of the value of the new medium. Displaying the restless enthusiasm and financial ambition that would mark his career, he wrote his sister Nancy late in May:

> You have read of the daguerreotype, an apparatus for taking views of buildings, streets, yards, and so forth. I had an invitation to join Mr. Pennell and in getting one, and partly to gratify my curiosity, and partly with the hope of making it profitable, I met Mr. Pennell and I cannot in a letter describe all the wonders of this apparatus. Suffice it to say, that I can now make a perfect picture in one hour's time, that would take a painter weeks to draw.
>
> (Robert Sobieszek, and Odette M. Appel, *The Daguerreotypes of Southworth and Hawes*, New York: Dover, 1980 (1976): xi)

Barely four months later, Southworth and Pennell opened a daguerreotype studio in Cabotville. Utilizing Alexander Wolcott's patented wooden-box camera, they produced commercial portraits while developing and perfecting the daguerrean process. Although their experiments proved successful—"we have very far surpassed anybody in this country, and probably in the world, in making miniatures"—Southworth and Pennell floundered financially. By the spring of 1841, the partnership was in serious debt and Southworth decided to relocate to Boston. With its prominent families, commercial wealth and large population, Boston seemed to Southworth the solution to the partnership's main financial difficulty: balancing commercial income with the rising costs of invention.

By June 1841, the Southworth and Pennell studio—now operating under the name of A. S. Southworth and Co.—was ensconced atop Scollay's building in Boston. In addition to portrait work, the company sold equipment, provided instruction and contracted for the manufacture of cameras, lenses, plates and cases. They prospered temporarily in their new environment and by 1842 had moved into a more permanent location on Tremont Row, the heart of Boston's artistic community. Yet despite these small gains, the new industry's financial landscape remained fickle. In 1843, Pennell left the company to take up a teaching position at a private school in the South. His place in the partnership was filled shortly afterwards when Southworth made the acquaintance of Josiah Hawes.

Josiah Hawes was born in East Sudbury, Massachusetts on 20 February 1808. After working on his family's farm, he apprenticed as a carpenter. In 1829 took up painting:

> Happening one day to come across an ordinary oil painting which I was admiring, a friend of mine asked me to close one eye and look at the picture through my hand with the other eye. The surpassing change which took place, from its being an ordinary flat canvas to a realistic copy of nature with all its aerial perspective and beauty so affected me, that from that time I was ambitious to become an artist. ("Stray Leaves from the Diary of the Oldest Professional Photographer in the World," *Photo-Era*, 16 (1906): 104–107)

For the next twenty years, he traveled New England as an itinerant portrait painter. Quite by chance, Hawes was in Boston in 1840 and attended the same Gourand lectures as his future partner. Unlike Southworth, Hawes was cautious. Unwilling to give up the steady income he received on his travels, Hawes continued to paint until 1841, when he became an itinerant daguerreotypist. In November 1843, Hawes was invited to join A. S. Southworth and Co. (whose name was changed to Southworth and Hawes in 1845). His financial prudence and artistic bent would perfectly complement Southworth's eye for the main chance.

While failing to shake its precarious financial state, the studio continued to achieve great artistic and social success. They attracted such luminaries as Charles Dickens (who, unfortunately, did not sit for a portrait), Ralph Waldo Emerson, Edward Everett, Charles Goodyear, Oliver Wendell Holmes, Henry Wadsworth Longfellow, Lola Montez, Lemuel Shaw, Harriet Beecher Stowe, Zachary Taylor and Daniel Webster. In addition, they produced important visual documents of such locations as the Boston Athenaeum, Niagara Falls, the operating room of the Massachusetts General Hospital, Mount Auburn Cemetery, the Boston Navy Yard and Docks, the Boston Common and the Emerson School for Girls. Unlike their Boston contemporary John Plumbe Jr., neither Southworth nor Hawes saw their studio as a potential

Southworth & Hawes. Portrait of a Young Girl.
The J. Paul Getty Museum, Los Angeles
© The J. Paul Getty Museum.

franchise. They utilized only the best equipment, did not hire outside journeymen and refused to lower their prices in the face of stiff competition. They shunned the conventions of standardized portraiture and sought to communicate a simple yet resonant representation of the sitter's personality:

> What is to be done is obliged to be done quickly. The whole character of the sitter is to be read at first sight; the whole likeness, as it shall appear when finished, is to be seen at first, in each and all its details, and in their unity and combinations and in the result there is to be no departure from truth in the delineation and representation of beauty, and expression, and character. (Albert Sands Southworth, "An Address to the National Photographic Association of the United States," *The Philadelphia Photographer*, 8 (1871): 315–323)

Dissatisfied with the meager income he derived from the studio, Southworth caught the Gold Rush fever and departed for California in 1849. He spent twenty-two months prospecting, yet his returns were minimal and he returned in poor health. The more practical Hawes stayed in Boston, and the studio continued in business. Southworth returned in 1851, and began to focus his attention on the invention and patenting of technical equipment. In 1853, the firm's "Grand Parlor Stereoscope" won a gold medal at the Fair of the Massachusetts Charitable Mechanics Association. Significantly larger and more complex than any previous stereoscope, the device was put on show in the studio and patented in 1854. The first image presented was the Greek statue *Laocoön*: admission was 25¢, a season ticket 50¢ and for those wishing to buy the stereoscope itself, the price was an enormous $1,160. Commenting on the technical marvel, *To-day* magazine found "the illusion and absolute and the effect of the *Laocoön* in this stereoscope is really finer than one often gains in looking at the statue" (Beaumont Newhall, *The Daguerreotype in America*, third revised edition, New York: Dover, 1976 (1961): 46). Further patents followed, most notably for a "plate-holder for cameras" which many thought evidenced no significant technological advance over those currently in use. In 1854, the studio ceased the production of daguerreotypes and took up the collodion glass plate process.

After twenty-one years of financial struggle, Southworth's exasperation reached its limit and he dissolved the partnership in 1862. He returned to the family farm in West Fairlee to settle his late father's estate and stayed to run it with his brother. He continued to practice photography, write for leading journals and address the National Photographic Association of the United States. In later life he became a handwriting expert and died in 1894. Hawes continued to run the Tremont Row studio for a further thirty-nine years and his late nineteenth century images of Boston are regarded as some of the finest documents of life in the city at that time. In the post-Civil War period, Hawes occasionally returned to his earlier itinerant career hawking Stereoscopic views of Boston around the New England countryside in a traveling wagon. Still active in the profession, Hawes died while on vacation in 1901. In tribute, *Photo-Era* magazine praised the achievement of "the oldest living professional photographer in the world": "he was the last link in the long chain connecting the past and the present of photography and he sat at the cradle of photography and helped to rock it into life" ("Stray Leaves from the Diary of the Oldest Professional Photographer in the World," *Photo-Era*, 16 (1906): 104–107).

RICHARD HAW

Biographies

Albert Sands Southworth was born in West Fairlee, Vermont, on 12 March 1811. Attended lecture on daguerreotypy by François Gourand in Boston, 1840; established the A. S. Southworth and Co. daguerreotype studio with Joseph Pennell, 1841; traveled in California prospecting for gold, 1849–1851; developed the Grand Parlor Stereoscope, 1853; left the firm of Southworth and Hawes, 1862. Gave keynote address to the National Photographic Association of the United States, 1871. Died Charlestown, Massachusetts 3 March 1894.

Josiah Johnson Hawes was born in East Sudbury, Massachusetts, on 20 February 1808. Attended lecture on daguerreotypy by François Gourand in Boston, 1840; joined A. S. Southworth and Co., 1843; developed photographic back-lighting and perfected the use of studio skylights, 1843–1845; married Nancy Southworth, 1847; continued to operate out of the Tremont Row studio as an independent photographer, 1862–1901. Died Crawford Notch, New Hampshire 7 August 1901. The Hawes daguerreotype collection distributed to the Metropolitan Museum of Art, New York, the Boston Museum of Fine Art and independent collectors, 1934.

See also: Daguerreotype; Daguerre, Louis-Jacques-Mandé; and Wet Collodion Negative.

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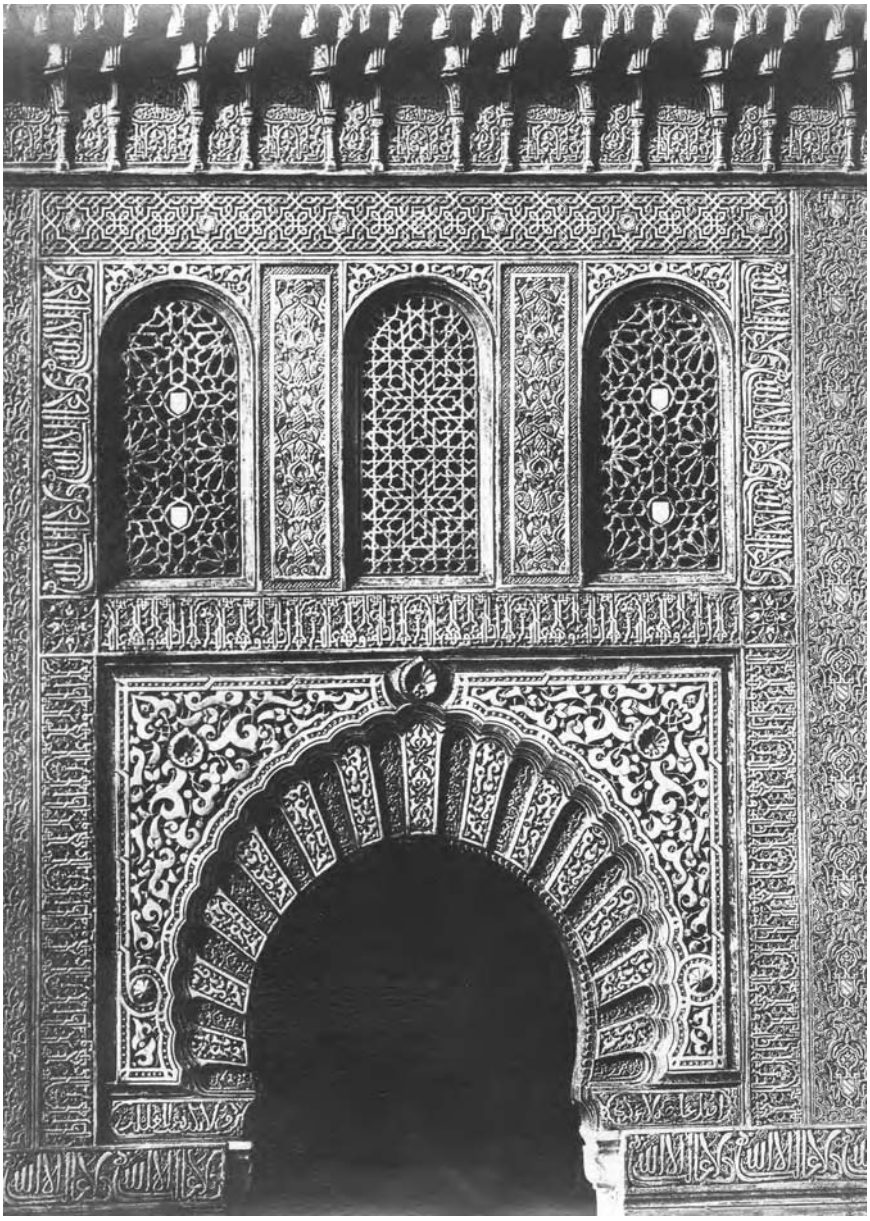
SPAIN

When François Arago publicly announced the invention of the daguerreotype at the Académie des Sciences (Academy of Sciences) in Paris on 7 January 1839, Spain was immersed in a dynastic conflict between Carlists and Liberals that was to determine whether absolutism would continue or give way to allow the consolidation of a constitutional monarchy. In the first third of the 19th century, Spanish society was still primarily agrarian and anchored in the structures of the past. The new photographic technology, however, was to illustrate how the most progressive intellectual and scientific circles committed to modernising Spain immediately learned about and became involved in the initial development of this invention, in spite of their country's economically and socially underdeveloped context. This fact, the lack of government support and the absence of any commercial backing or stimulus characterise the introduction of photography in Spain.

The main figures involved in the earliest introduction of photography into Spain all belonged to the same progressive cultural and scientific elite. Many of them were doctors associated with Barcelona's Academia de Artes y Ciencias (Academy of Arts and Sciences),



Clifford, Charles. The Alhambra, Granad. One of 58 prints in an album entitled: Eighteen architectural studies & city views of Spain by Charles Clifford plus other veiws of Spain and Canada by others.
The J. Paul Getty Museum, Los Angeles

and several happened to be in Paris during the first weeks of 1839 (Pedro Monlau, Joaquín Hysern, Pedro Mata, Ramón Alabern) and were among the privileged few to see the first daguerreotypes and even Daguerre himself at work. Pedro Monlau was to act as the Paris correspondent for the Barcelona Academy. Shortly after the invention was announced, he issued a very detailed report, which was later published by the magazine *El Museo de Familias*. Once back in Barcelona, an enthusiastic Monlau introduced the daguerreotype process to his fellow academicians at a session held on 6 November 1839 and presented the view of the church of the Madeleine that Alabern had taken in Paris. He suggested that the Academy purchase Alabern's equipment at cost price. This was agreed, and the Academy then decided to convene the citizens of Barcelona so that they could witness a demonstration of the process in what was to be the first known recorded use of the daguerreotype in Spain. This public presentation of the daguerreotype took place on Sunday 10 November, as announced by the *El Constitucional* newspaper and the *Diario de Barcelona* in its entertainment section. The exterior view of the Lonja building was the subject of this first, no longer extant, daguerreotype, again produced by Alabern after a 22-minute exposure.

The origins of photography in Madrid were also linked to Barcelona's Academia de Ciencias (Academy of Sciences) through a group of liberal scientists who worked in the capital and were also members of Madrid's Liceo (Lycée). A few days after the event

in Barcelona, on 18 November 1839, professors Juan María Pou y Camps, Mariano de la Paz Graells and José Camps y Camps, still unaware of the Catalan experiment, made their first daguerreotype—the second made in Spanish territory—which required a longer exposure (60 minutes) due to poor light conditions. This time the subject, a view of the Royal Palace from the right bank of the Manzanares River, was probably related to the interest shown by the Queen-Regent María Cristina [Maria Christina], who agreed to watch the demonstration.

The role played by the aforesaid liberal circles in developing the new invention is also demonstrated by the translation into Spanish and publication, in that very same year, 1839, of up to five different versions, varying in scope, of Daguerre's manual. One interesting example was prepared by Joaquín Hysern and Juan María Pou y Camps and titled *Exposición histórica y descripción de los procedimientos del daguerrotipo y del diorama*. This version includes a preface on photography and its relationships to the arts and sciences, with notes on the authors' own experiences. It offered two innovative theoretical photometry methods, which were surely the first of their kind in the field of photography, but they did not have the recognition they deserved outside Spain. *El daguerrotipo. Manual para aprender por sí solo tan precioso arte y manejar los aparatos necesarios* by E. de L. (Eduardo de León y Rico), published in 1846, stands out amid the second generation of publications on the invention, which appeared from that year onward.

With no apparent contact among cities, this type of non-professional circle continued to practice and disseminate the first advances in this new technology until well into 1841, with no financial backing from any institution and supported only exceptionally by private investors. The press played a very active role in spreading news of the invention and from the outset reported the major international developments in this field.

The year 1842 undoubtedly marks the start of a new era in photography in Spain, characterised by very different objectives and new key players. In a less confrontational political context characterised by greater economic development, the foundations were laid for photography to be launched as a business and for its professionalisation, in much the same way and at about the same time as in the rest of the Western world. Now the protagonists were travelling foreign daguerreotypists who came mainly from France (Mr. Constant, Etienne Martin, Mr. Anatole, Rousson, Jean Gairoard); Great Britain (Charles Clifford); Germany (Taylor and Lowe, Joseph Widen, Madame Fritz); Switzerland (Woelker, Schmidt); and Poland (Count of Lippa). These photographers, most of whom had been unable to cultivate a steady clientele in their own countries, came to Spain to exploit a totally virgin market. Their commercial strategy was to boast artistic or academic credentials, or claim links with Daguerre's circle or dubious aristocratic titles. They usually travelled over wide areas of the peninsula, promoting themselves by placing advertisements in the local press upon arriving at each new town. They often had to combine their trade with other activities such as selling photographic products and teaching the new techniques. Their didactic efforts were indeed crucial to the development and definitive implantation of photography in Spain, because they provided technical knowledge to future Spanish daguerreotypists, who at first were also itinerant and mainly anonymous. From the 1850s onward, some of these itinerants would become fairground photographers, who followed specific routes and worked in standard settings in a profession that survived little changed until the latter part of the 20th century. The majority, however, began to set up professional studios. Mauricio Sagristá opened his establishment in Barcelona in 1842, only a year after the first studios were inaugurated in Philadelphia and London; José Beltrán opened one in 1843 in Madrid, and Francisco de Leygonier started his in Seville in 1845. From 1846 onward, photographic studios were established in numerous urban centres.

Very soon, certain figures began to stand out, including the French photographers Eugenio Lorichon and Franck (François-Alexandre Gobinet de Villecholles) as well as the Spaniards José Albiñana, who successfully took part in the Paris Exposition Universelle of 1855, and Napoleón (Fernando and Anaïs Fernández Napoleón, the latter one of Spain's first professional women photographers). By mid-century hundreds of portrait photographers were already plying this new trade, mainly in the major cities, although they simply recorded their subjects and seem to have had little in the way of aesthetic pretensions, as elsewhere. The most popular daguerreotype formats were 1/4 (10.8 × 6.3 cm.) or 1/6 (8 × 7 cm.) of a plate. Their high prices, although lower than those for paintings, still limited sales to members of the affluent classes. Few daguerreotypes were made of streets or monuments, and those that have survived are usually of major attractions such as Granada, for which there was a ready market among travelleres. In fact daguerreotypes were not used for long. In the 1850s they coexisted with the new photographic techniques that began to appear on the market, such as paper and glass negatives, and in the 1860s they began to be definitively replaced by the new processes.

Long before the invention of photography, southern Spain was a must for foreign travellers, literati and draughtsmen, who were attracted by the exoticism of its Moorish past, still visible in its monuments, and by the local colour of its inhabitants. The late onset of industrial development allowed Spain to continue to provide inspiration for the romantic, orientalist spirit that was a

prevailing characteristic of Western culture at the time. Photography immediately became a tool for this tradition and fulfilled its original goal of obtaining images of the world's most beautiful monuments and places. To cite an early example, in 1840 the writer Théophile Gautier and Eugène Piot travelled with daguerreotype equipment to record mementos of their trip through the Iberian peninsula. But above all, the large European publishers of illustrated publications began to send their own employees to obtain images on which to base engravings. This was true of the series on Spain made by Edmond François Jomard for the famous *Excursions daguerriennes* by Noël-Marie Lerebours, which included two views of Granada (the Patio de los Leones and the Albaicín) and one of Seville (the Alcázar). This series is particularly important as an iconographic reference for the numerous photographs made of the country from then on. Initiatives similar to these foreign publications also began to appear in Spain itself, such as *Recuerdos y Bellezas de España* (1839–1865), published by Francisco Javier Parcerissa y Boada.

The development of calotypes, with their ability to be reproduced, definitively spurred the foundation of the first photographic publishing houses. Starting in 1845 with Nicolaas Henneman's contributions to the *Talbotype Illustrations to the Annals of the Artists of Spain*, many travellers, mainly British and French, arrived in Spain, often on their way to the Middle East, and took photographs that were later marketed in their own countries. These travellers included: Louis-Auguste and Auguste-Rosalie Bisson (c.1848), Claudius Galen Wheelhouse (1849), Louis-Alphonse Davanne (c.1850), the Mayer brothers (c.1850), Vicomte Joseph Vigier (1850, 1851, 1853), Hugo Owen (1851), August F. Oppenheim (1852), Edward King Tenison (c.1853), John C. Grace (c.1854–56), Charles Piazzi-Smyth (1858), aided by his wife Jessie Duncan, Gustave de Beaucorps (1858), Jakob August Lorent (1858), Francis Frith (c.1856–59), Warren de la Rue (1860), Claude-Marie Ferrier (1861), R. P. Napper (c.1863), Louis de Clercq (c.1863), Charles Thurston Thompson (1868), George Washington Wilson (c.1889), and Paul Nadar (c.1895). Likewise, some of the foreigners settled in Spain began to use calotypes, including Clifford, Franck and Leygonier (who opened Seville's first studio and sold calotypes), as did Spaniards such as Pascual Pérez y Rodríguez in Valencia.

Most of these photographers busied themselves producing images—views and popular characters—of typical locales, such as Madrid (El Escorial, the Royal Palace and the Puerta de Alcalá) and Andalusia, the places visited frequently by the romantic travellers who were also devotees of calotype prints.

The presence in Seville of a figure such as Antonio María Felipe Luis d'Orléans, Duke of Montpensier, who was a patron and collector of photography, surely attracted some of these travellers too. In general, there was a certain thematic homogeneity, although some photographers, who were usually anonymous, recorded scenes of everyday life for local sale. Images of Spain's colonies overseas, taken by Mouton y Villar and Juan Buil, among others, also departed from this idealised repertory.

But the true counterpoint to this romantic representation of an idealised Spain came from another series of images: industrial photographs linked to the technical and scientific modernisation process carried out during the liberal monarchy of Isabel II (1843–1868). On another level, however, they could also be understood as an exaltation of what was sublime within the technological landscape and therefore as a continuation of a certain romantic aesthetic. During this period, the Crown used this new form of representation both as a symbol of technological modernity and to legitimise and promote a different view of the country more in line with the development of the industrial revolution. Major public works, such as the bridges and railways that were radically transforming Spanish territory, were documented. Two of the best in this field were Charles Clifford, and the Frenchman Jean Laurent, who were undoubtedly the most important foreign photographers in 19th-century Spain. Clifford was Isabel II's court photographer from 1858 onwards, and accompanied her on royal visits; much of his work was used as a powerful political propaganda tool favouring the monarchy and the progress it promoted. Apart from his more picturesque series, Clifford documented the construction of the Canal de Isabel II (1855–56 and 1858), which has continued to provide water to Madrid ever since. He also documented one of the era's great urban renovations, that performed in Madrid's Puerta del Sol (1856–1862), a square conceived by liberals as a new monumental and central public space. These photographs of the Puerta del Sol recall Marville's work on Paris during Haussman's remodelling. At the time photography in Spain was clearly in the service of government institutions, as was confirmed in Spain's capital city by the Royal Order of 8 May 1869 requiring all public works to be photographed and copies sent to the main institutions.

J. Laurent, who had lived in Spain since 1843 and who began to take photographs in 1857, created the 19th-century's most important commercial enterprise and photographic archive of Spain (Laurent y Cia.), which employed hundreds of professionals. Its Paris branch distributed work throughout Europe for over 50 years. Laurent's company documented all sorts of subjects, ranging from cities, monuments and reproductions of masterpieces of Spanish painting to celebrities and popular characters. His photographs of railways left and invaluable record, like those he made in collaboration

with José Martínez Sánchez of public works in 1866–67, a group of photos that was chosen for the Paris Exposition of 1867, together with Clifford's views of the Canal de Isabel II.

Topographical photography documenting industrial architecture gave way to some of the most interesting pictures from a compositional viewpoint due to their adoption of innovative spatial concepts and a new iconography devoted to modern buildings and the landscapes resulting from human interaction with nature. This was made easier because photography had finally overcome the greatest technical disadvantages limiting outdoor images. Works by José Rodrigo, Pau Audouard, William Atkinson and Pérez y Rodríguez should be added to those mentioned previously. Train images by J. Laurent, José Spreáfico, Auguste Muriel and Martínez Sánchez documented the birth of the many railway lines that, together with new roads, began to cover the peninsula. This increase in transport facilities was spectacular and a boon to photographers because it reduced distances and stimulated the penetration and dissemination of new ideas.

With new advances in photomechanical printing and the spread of the use of collodion and albumen paper, the 1850s also brought the initiation of a Spanish photographic industry. These factors enabled the marketing and mass production of large catalogues, albums and the popular "Photographic Museums," which offered all kinds of images for sale, most of them produced by stereoscopy. In addition to all the Spanish producers of stereoscopic views, at this time large foreign companies, such as the London Stereoscopic Company or Frith & Co., also sent their photographers to capture the country's most typical images.

In the Spanish market it was in the 1860s that the preponderance of foreign photographers was finally reversed in favour of Spaniards. This decade inaugurated the era of large studios and of *carte-de-visite* portraiture, which spread by means of the family album. In Spain, as in the rest of the world, the introduction of *carte-de-visite* meant a certain democratisation of photography, since they were within reach of a much wider public due to their being priced much lower than daguerreotypes. This development created a domestic market and a national photography that was able to fulfil the aspirations of the liberal bourgeoisie, who after the revolution of 1868 needed a way to reflect its growing power and associate itself with a technology that symbolised modernity. Consequently, large galleries of celebrities, consisting of portraits of all sorts of famous people, became the rage and were displayed in the show-windows of studios, usually located in the nerve centres of cities such as Madrid's Puerta del Sol. The most prestigious studios during this period belonged to Pau Audouard, Moliné y Albareda, A. Espulgas and Napoleón in Barcelona; Laurent, José Albiñana, José Martínez Sánchez, Eusebio Juliá, Julián Martínez de Hebert, Alonso Martínez, Edgardo and Fernando Debas, Manuel Compañy, Christian Franzen and Bois-Guillot in Madrid; Antonio Cosmes and Antonio García Peris in Valencia; Xasajús, Leygonier, Lorichon, Enrique Godínez, Julio and Emilio Beauchy, and Barthe-Boyer in Seville; H. Otero and M. Aguirre in San Sebastián; José García Ayola in Granada; Spreáfico in Malaga; and Francisco Zagala in Pontevedra. As elsewhere, many painters and miniaturists decided to adopt the new medium and became photographers, retouchers or lighting technicians, using their artistic skills to win new clients and improve photographic craftsmanship.

If scientists played a vital role in the initial dissemination of photography in Spain, photography, in turn, was to become an indispensable tool for science as technology continued to develop. It was applied in myriad fields, from taxonomy to the analysis of animals, plants and insects, etc. By 1862, Rafael Castro y Ordóñez, a member of the Comisión Científica del Pacífico (Scientific Commission of the Pacific), was already making a photographic record of the Commission's expedition to South America. In astronomy, José Monterrey and Warren de la Rue shot a solar eclipse in 1860, and a decade later in Cadiz, John Spiller and William Crooks recorded the transit of Venus. Photography entered the medical world in 1874, when some doctors in Barcelona were authorised to photograph their patients or use images of patients for teaching purposes. From the mid-1860s onward, photography was also employed as a new tool for social control to document delinquents or condemned prisoners. One extant example of this practice is the series of photographs of bandits that the police commissioned from J. H. de Tejada in 1870.

The relationship between photography and the press in Spain dates from the 1850s, when the first newspapers and illustrated magazines began to use photographic images as the basis for their engravings. From the 1860s onwards, with the improvement of printing techniques, they were able to include photographs directly. The introduction of wet collodion, which enabled shorter exposure times, was a key event in this field, although photography had to wait for the silver bromide gelatine era to achieve real instantaneity. From 1858 noteworthy photographers, including Clifford and Laurent, were asked to contribute regularly to magazines like *El Museo Universal* and *La Crónica* respectively. *La Ilustración Española y Americana*, the most popular illustrated magazine in the 1880s, enlarged its staff with a wide network of regional photographer-correspondents, among whom Juan Comba García, considered one of the founders of Spanish photojournalism, stood out. Nonetheless, the full integration of photography into the press did not occur until the 1890s, when modern illustrated journals

such as *Blanco y Negro* (1891) appeared, and marked the birth of the 20th century. One of the regular contributors to *Blanco y Negro* was the Danish diplomat Christian Franzen, the other great figure in photojournalism and official photographer for Madrid's high society. Franzen also introduced the use of magnesium in Spain, which made it possible to photograph in poorly lit areas. This new market, which provided reporters with an outlet for their work, encouraged photographic testimonies of current events and wars. For instance, Carlist prisoners in Valencia were photographed by Antonio García Peris in 1869, and the bombing of Durango and San Sebastián was recorded by H. Otero and M. Aguirre in 1873. Photographs of the Moroccan War of 1859 taken by painter Mariano Fortuny y Madrazo, among others, and commissioned by General O'Donnell, were clear examples of reportage requested by political authorities for propaganda purposes. The work of Alfonso (Alfonso Sánchez García) should also be mentioned, as he was probably the most important Spanish photojournalist of the generation that started to work at the end of the century documenting a poor and depressed Spain after the crisis of 1898, when the country lost its last colonies overseas.

Apart from the importance of these press reports, Spain also had a series of photographers, often amateurs, whose work constituted a valuable anthropological record, as shown in the Mallorca photographs taken by Tomás Montserrat, those of Holy Week in Lorca by José Rodrigo, the Museo fotográfico (Photographic Museum) and Toledo series by Casiano Alguacil Blázquez, the views of Valladolid taken by Bernardo Maeso, and even the photographic records of Ramón y Cajal's trips to the United States and Antoni Amatller i Costa's journey throughout Northern Africa and the Near East.

At the end of the 1880s, the evolution in photographic reproduction methods and a new demand for print jobs caused the expansion and transformation of many studios into phototype workshops and establishments, and a range of specialised photographic trades appeared. This enabled more flexible ways for professional photographers to market their images and turned the sale of albums, limited editions of scenic views, collectible series, postcards and posters into a lucrative business. These images covered everything, from aerial views of Barcelona to public executions (Isidro Montpart), sports themes (the Debas brothers), to popular views of Madrid (Hauser y Menet). These photographers, and Laurent himself, were just some of many who set up this type of workshop.

As regards photographic products (plates, cameras, paper, etc.), at the end of the century the industry remained almost completely dominated by foreign companies, with the sole exception of Manufactura General Española de Productos Fotográficos S.A., a company founded in Murcia in 1893 to manufacture the *Victoria* bromide gelatine plates and aristotype (citrate) paper. Because of this dependence on foreign sources, important establishments opened in Spain and joined other shops like pharmacies as distribution centres, selling all kinds of photographic materials and systematically advertising their wares in the press. There are very few Spanish contributions to the development of photographic techniques, with exceptions like the leptographic paper patented by Laurent and Martínez Sánchez and research on colour photography, a matter of interest for many amateurs and scientists, including Nobel Prize winner Santiago Ramón y Cajal.

Professional studios reached their height of popularity during the last third of the 19th century, in the era of the Restoration of the Monarchy. This was due to the widespread acceptance of stereoscopy and to the introduction of new portrait formats (*Cabinet, Victoria, Promenade, Boudoir, Imperial*), now added to the already well-established *carte-de-visite*. In terms of photographic processes, the ambrotype was not very successful in Spain, but ferrotypes became quite popular from 1880 onwards; at about the same time both bromide gelatine dry plates and hydroquinone developers first began to be used.

The phenomenon of the expansion of these studios is also marked, however, by an increase in clients that paralleled the epoch's rapid demographic growth, particularly in large cities, which had doubled and tripled their population and had become poles of attraction for the rural exodus. Every urban centre of importance had its photographic studio, and by 1900 there were 439 legally registered establishments concentrated in major cities. Nevertheless, this proliferation took place at the cost of portrait quality, which progressively declined due to the limited technical expertise and low cultural level of photographers who began to work during this period.

The end of the golden age of photographic studios coincided with the turn of the century, marked by the serious economic crisis of 1898, which had repercussions in all financial and industrial sectors and forced a crucial change in the photographic industry. But the seeds of this deep transformation in Spanish photography had been sown previously by the great technical strides represented by bromide gelatine dry plates and the introduction of the first Kodak box cameras in 1888. The number of amateur photographers rapidly grew, reaching more than a thousand in Madrid and almost three thousand in Barcelona. It was now mainly these amateurs, not the studios, who sought and achieved better quality in their photographs. The market soon focused on them, for example with the first specialised magazines, which responded to their interests and technical needs, and organised activities, contests and prizes.

The first photographic societies, clubs and associations also grew up around these magazines. In general, members of such groups still came from the more prosperous social classes. The pioneer magazine was *La Fotografía*, founded in Barcelona in 1886. Figures as vital for the future development of Spanish photography as Luis de Ocharán, Antoni Amatller i Costa and Antonio Cánovas began to stand out among these enthusiasts. Cánovas, known as Kaulak, was one of the instigators of the photographic section in Madrid's Círculo de Bellas Artes (Circle of Fine Arts) (30 December 1899), which a year later became the Sociedad Fotográfica de Madrid (Madrid Photographic Society). This group, as well as other new societies and associations, very soon became the stronghold for the new form of Pictorialism that would develop in Spain after being imported from Europe at a very late date, and which was to continue well into the 20th century.

Diana Saldaña

See also: Pou and Camps, Juan Maria Franck (François-Marie-Louis-Alexandre Gobinet de Villecholles); Piot, Eugène; Noël-Marie Lemercier, Lerebours & Bareswill; Henneman, Nicolaas; Bisson, Louis-Auguste and Auguste-Rosalie; Wheelhouse, Claudius Galen; Davanne, Louis-Alphonse; Vigier, Vicomte Joseph; Owen, Hugh; Oppenheim, August F; Tenison, Edward King; Piazzi Smyth, Charles; Lorent, Jakob August; de La Rue, Warren; Leon, Moyse & Levy, Issac, Ferrier, Claude-Marie, and Charles Soulier; de Clercq, Louis; Thompson, Charles Thurston; Wilson, George Washington; Calotype and Talbotype; London Stereoscopic Company; and Frith & Co.

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SPARLING, MARCUS (1826–1860)
Irish photographer

Marcus Fitzell Sparling was born in Ireland, and at age 20, enlisted in the 4th Light Dragoon Guards on March 17th 1846. After five years of service he was awarded a 'Good Conduct Chevron.' He was discharged from the army on September 6, 1853, and left with the honorary rank of corporal.

By then he was already a member of the recently formed Photographic Society of London, participating in the Society's second meeting, where he introduced a variation on Major Halkett's folding field camera. Reports of the meeting by Sir William Newton referred to him as 'Corporal Spalding,' to which he took exception, fearing that the attribution of a rank to which he was not entitled would earn him the disrespect of his regimental colleagues. His protest was published in the Society's Journal as being from M. N. Sparling.

Also present at the meeting was Roger Fenton with whom Sparling developed a lasting professional relationship. Indeed, he was living at Fenton's address by the end of 1853, giving his occupation as 'chemist,' and presumably already employed as his assistant.

He accompanied Fenton on his autumn photographic journey to Yorkshire, and in 1855 he worked as his assistant in the Crimea.

In 1856 he published his manual *Theory and Practice of the Photographic Art*, 'drawn from the author's daily practice,' this time identifying himself as 'W. Sparling, assistant to Mr Fenton in the Crimea.'

He was just 34 years old when he died in Liverpool on August 19, 1860, of hepatitis.

JOHN HANNAVY

SPENCER, WALTER BALDWIN (1860–1929)

British-born Professor of Biology at the University of Melbourne, he is better remembered as an anthropologist. Following formative work amongst the Arrernte people during the 1894 Horn Expedition to central Australia, he made other field trips to remote areas of central and northern Australia. With his collaborator, Frank Gillen (d. 1912), he made many hundreds of photographs and also pioneered the use of film in anthropological fieldwork. Their collaboration was so close that it is not always possible to attribute authorship to individual images. They developed and printed much of their own work and wrote to each other constantly on matters photographic. Spencer was also friendly with the distinguished Australian photographer J.W. Lindt who advised him on occasion. Whilst the photographs were made with scientific intent, many are both culturally engaged and aesthetically aware. The photographs were broadly disseminated. Not only were many of them published in Spencer's ethnographic monographs, such as *The Native Tribes of Central Australia* (1899), but he gave popular lantern lectures on aboriginal culture to packed halls throughout his career. His photographs are now in Museum Victoria, Melbourne, where they are curated with careful attention to the needs of the descendants of the indigenous communities with whom Spencer worked.

ELIZABETH EDWARDS

SPILLER, JOHN (1833–1921)
Chemist

Spiller was born on 20 June 1833, the son of an architect, and attended the City of London School where he showed a particular aptitude for science. He continued his studies at the private Royal College of Chemistry, (RCC), joining in 1849. The RCC had been founded by public subscription in 1845 with the purpose of training chemists to help the economic growth of the country. The training was practical and laboratory based. After two years the best students could become research assistants. Spiller was following this route until the RCC ran into financial difficulties and in 1853 merged with the Royal School of Mines, (RSM), whose Head was Dr Percy, a distinguished metallurgist and a photographer. Spiller transferred to the RSM, where, under Dr Percy's tutelage, he and two colleagues completed an important and comprehensive series of chemical analyses of British iron ores.

The state of photography at the time was such that although many basic principles had been established, there were real problems with the reliability of processes

and the reproducibility of results. This was an ideal and fertile ground for a chemist to delve into. Spiller was one such chemist, and a year ahead of him at the RCC was another, William Crookes, with whom Spiller was to forge a deep friendship. They both appear to have devoted much of the summer of 1852 experimenting at home with the waxed paper process. In 1853 Spiller's emphasis switched to the wet collodion process, and he had his first "Letter to the Editor" published in the *Journal of the Photographic Society* (*JPS*). It concerned the use of the pronitrate of iron for developing collodion images.

In May 1854, Spiller and Crookes published a paper in the *Philosophical Magazine* (*Phil Mag*), which really brought Spiller's name before the photographic community. It was on a method for extending the "life" of wet collodion plates well beyond the normal few hours. This necessitated the retention of a moist surface, which they achieved by putting the sensitised plate into a bath of fused zinc nitrate for about five minutes and then drying. The plate showed no sign of deterioration in sensitivity after a week. They had searched for a deliquescent material that would maintain the plate in its "pappy" state. It seemed a neat chemical solution to the problem. The method attracted much attention but had limited success. A few months later another paper in the *JPS* and the *Phil Mag* proposed using fused nitrate of magnesia. Further experimentation was promised and was revealed, in 1856, in a third paper in the *Phil Mag* (see Further Reading). The possibility of using glycerine was raised in the first article. Now they claimed priority for the suggestion, and developed a workable process. They also looked into other deliquescent materials, but still recommended glycerine. This was fine work by the two young chemists, but it was overtaken by the invention of the dry collodion plate.

During 1856 Dr. Percy invited Spiller on a photographic holiday in Devon. Percy was an active photographer who participated in the Exchange within the Photographic Society of London, (PSL), which produced the Photographic Albums for 1854 and 1857. The latter Album contains the photograph entitled "The New Mill near Lynton North Devon" by Percy and Spiller, taken, (not surprisingly), on collodion, September 1856. It is the only known published photograph by Spiller.

It was in 1856 that Spiller left the RSM and joined Woolwich Arsenal as an assistant chemist. In 1861 Spiller founded the Photographic Department there and lectured on photography at the Royal Artillery Institute and the Royal Military Repository. He continued to produce an impressive stream of articles on the chemistry of photography, and became well known as a knowledgable practitioner, particularly on collodion. He also devised Spiller's Reducer, using copper chloride to thin down negatives. Some of the articles owed their existence to his continuing close friendship with Crookes. Crookes was successively editor of three photographic journals, and at times he was glad to have a friend he could turn to for an article to publish. In 1860 Spiller and Crookes were able to join forces to photograph the partial solar eclipse of the sun, using the telescope at Woolwich. They produced a good set of photographs, of which Spiller was especially proud. Spiller also took pride in being something of a champion of the Woodburytype process. He had been at the first demonstration of the process in London in 1865. At a British Association meeting in Dundee in 1867, he devoted most of a paper about new processes in photography to the Woodburytype.

In 1868, at the invitation of his brother, Spiller left Woolwich and joined the firm of Brooke, Simpson and Spiller as Chief Chemist. They were manufacturers of synthetic dyes, and Spiller was to remain with them for the next twenty years. Spiller's interest in photography remained undiminished, as the flow of articles, mainly on the chemistry of photography, testifies. Of particular significance was a paper, "On the action of chloride of gold upon certain salts of silver" in 1869. This has been regarded as the true invention of the self-toning principle. Spiller himself acknowledged that, although he proposed the idea independently, he was not the first. Surprisingly, he did not join the PSL until 1867, but eventually he occupied, at various times, every office. He was President in 1874–75 at a time of great crisis, when a separate Society might well have been formed. Spiller played a great part in holding the PSL together. Alas, the friendship with Crookes did not hold together. Crookes had become interested in spiritualism and Spiller attended a séance with him. They had different versions of events, which led to a spectacular row in the press in 1871 and the end of their friendship. However, Spiller attended the Golden Wedding celebrations of Sir William and Lady Crookes in 1906, having been their "best man." Spiller remained a member of the, by then, Royal Photographic Society, until his death in 1921, aged 88.

JOHN SAWKILL

Biography

John Spiller was born in London on 20 June 1833, the son of an architect. He attended the City of London School and then moved to the Royal College of Chemistry in 1849. He transferred to the Royal School of Mines in 1853 and analysed British iron ores. He then became an assistant chemist at Woolwich Arsenal in 1856, setting up the Photographic Department there. After twelve years at Woolwich, and at the invitation of his brother, Spiller joined the firm of Brooke, Simpson and Spiller as Chief Chemist. They manufactured colour dyes and Spiller was to stay with them for twenty years. In 1859

Spiller was elected a Fellow of the Chemical Society. He joined the Photographic Society of London in 1867, occupied every office and was President in 1874/75. He married twice, first to Caroline Ada Pritchard and then to Emma Davenport. He died in London on November 8, 1921.

See also: Crookes, Sir William; Percy, John, Wet Collodion Negative; Wet Collodion Positive Processes (Ambrotype, Pannotype, Relievotypes); Waxed Paper Negative Processes; and Woodburytype, Woodburygravure.

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SPIRIT, GHOST, AND PSYCHIC PHOTOGRAPHY

The nineteenth century saw the science and rationalism of the previous century emerge as an even stronger force of change further empowered by the mercantile thinking of a growing middle class. There was an almost frenetic quest for knowledge that rode on the surge of the industrial revolution. The growth of evolutionary and progressive science such as for example Charles Darwin's theory of evolution were perceived to challenge ideas of established belief systems particularly undermining the fundamentalist structure of 19th century Christianity. That the origin of mankind may have been a slow selective development from primates as opposed to a divine creationist intervention was considered both blasphemous and, as the argument developed, increasingly calamitous.

With these changes in perception a battle emerged between the desire or need to continue to believe in the numinous—and as its antithesis an increasingly empirical, materialist vision of creation. The middle ground was indeed growing treacherous underfoot. In his poem *Dover Beach*, the 19th century poet Mathew Arnold described how faith, like the tide, was retreating;

> But now I only hear, Its melancholy, long, withdrawing roar" revealing the, "naked shingles of the world. (Trilling, p.594)

The process of photography is a familiar presence in contemporary life. The photograph has become our ubiquitous shadow and like a shadow is with us in many forms everyday of our lives. Yet when Louis Jacques Mandé Daguerre's process of photography was announced to the world in January 1839 those who examined the new image making process saw the medium not only as a scientific marvel but also as a miraculous aid to drawing that would revolutionise recording and effect an irreversible change in human perception. The photograph has not only altered the way in which we interpret the world around us, it has also affected the manner in which we perceive ourselves (Webster,1).

As a form of representation of external reality the photograph played a powerful role in helping to establish concepts of order and interpretations of a shrinking world. As images were constructed subjectively they were (often it seems unwittingly) used to confirm what was already understood rather than as a cipher of new knowledge.

The apparent veracity of the photographic image lent it an unprecedented (and often unquestioned) credibility. The camera's ability to accurately reproduce the world on a two-dimensional surface stood as proof that the manner in which a subject was recorded was definitive and unquestionable. The photograph was held in a position of unparalleled importance as a piece of factual evidence.

As a device of moralising and comparison the photograph was unsurpassed—for as it was so closely linked to reality belief followed.

When discussing Roland Barthe's posthumously published text *Camera Lucida* John Tagg highlighted these points:

> The camera is an instrument of evidence. Beyond any encoding of the photograph, there is an existential connection between the 'necessarily real thing which has been placed before the lens' and the photographic image': every photograph is somehow co-natural with its referent.' What the photograph asserts is the overwhelming truth that 'the thing has been there': this was a reality which once existed, though it is a reality one can no longer touch. (Tagg, 1)

In the nineteenth century the photograph seemed to affirm that science could transcend the confines of raw nature and that through man's ingenuity science would be the medium that allowed nature to record itself.

One extreme example of this was the case recorded in *The Photographic Times* of 1863 where a murder victim's iris was photographed, the negative enlarged and when viewed under the magnifying glass the

outlines of a human face (the murderer's imprint) could be made out.

> So exaggerated then was the efficacy of the all-seeing mechanical eye and so readily was its recorded image acceptable that those present had no difficulty in seeing the details of the face of the murderer. They saw what they wanted to see: long nose, prominent cheekbones, black moustache and other sinister distinguishing features. (Nickell, 146)

The revolution of photography democratised vision in the same way that the printing press revolutionised the dissemination of learning and knowledge. Although photography did in itself create a window on a smaller shrunken world, its effect was one of enlarging the life experience of the huge mass of avid viewers. And still the perception remained that the camera could not lie—its basis was in optics and chemistry.

It may seem slightly ironic then that the camera and the process of photography—very much a result of a time of innovation and upheaval—should become the tool for those whom wished to prove the existence of an incorporeal afterlife. Yet the belief in the camera's veracity as objective machine of record would ultimately lend credence to the claims of proof when photographic evidence was produced of supernormal phenomena.

When we view a photograph from the early period of portraiture there is an inherently poignant quality about these images. These are the shades of the dead, their actual reflection in silver, recorded as the light was reflected from the skin in darkening silver. Perhaps the irony of these early images of the then living is that they serve to confirm mortality rather than ensuring immortality.

For the Victorians it surely was secure the shadow ere the shadow fade. In industrial centres there were swiftly changing demographics and high mortality rates. The child mortality rate in cities, stable in the smaller decentralised centres, rose alarmingly. Death became a more pronounced cultural aspect of society.

This nineteenth century involvement with mortality, its possible antecedent the afterlife, and new questions of belief, resulted in an intricate relationship with photography, where families celebrated death in albums that included photographs of clocks recording the time of death as well as the post-mortem photographs themselves.

So where rationalism and Darwinian theory challenged belief, the photograph provided at least one place of seeming permanence and an afterlife. Where belief was accentuated the rise of new spiritual movements and spirit photography provided another.

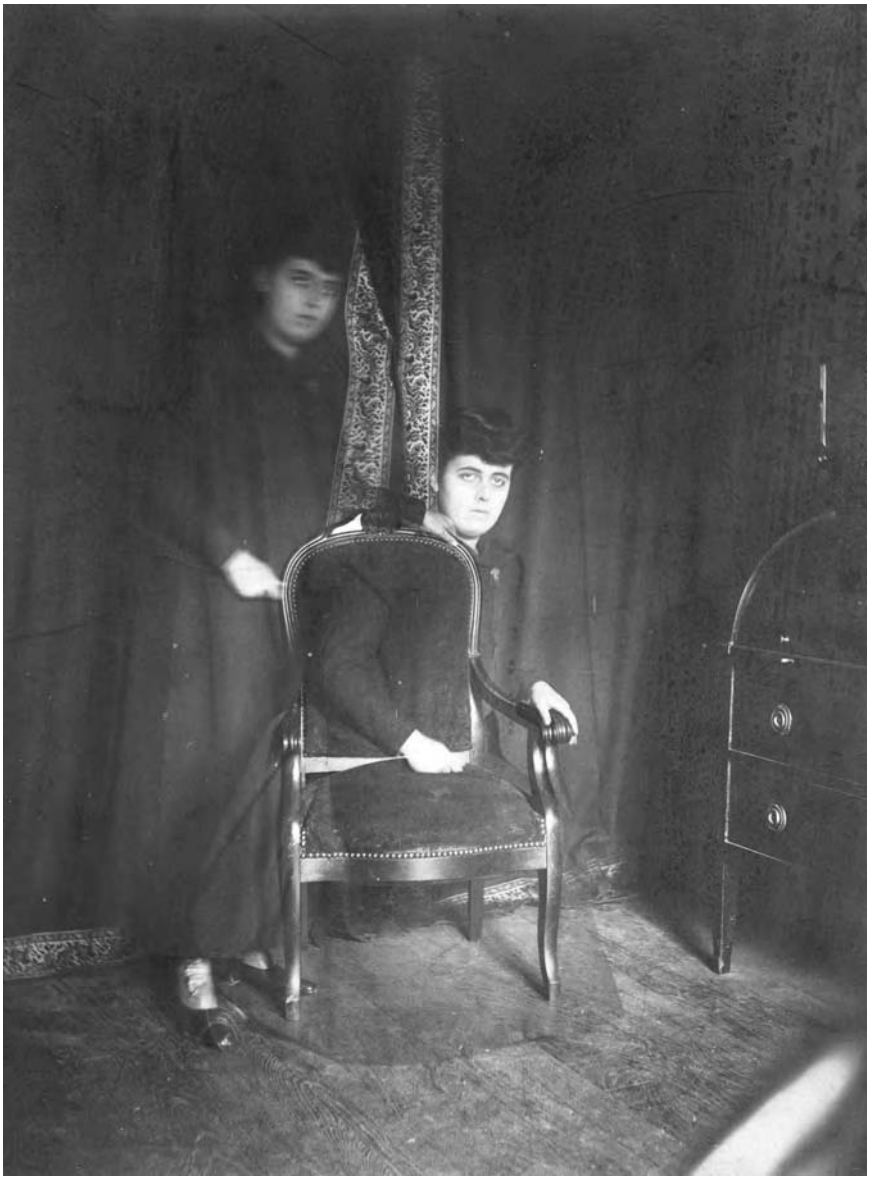
Communication with the dead was not a new phenomenon that arose in the medium's parlour of the nineteenth century. However this occult practice gained new momentum through the growing desire for assurance that there was indeed an afterlife.

Spiritualism itself began as a movement in the United States in 1848 with the séance activity of Margaretta and Katie Fox, sisters from a family in the village of Hydesville, Wayne County, New York. Not only could these sisters apparently communicate through rapping's with the spirit world but also the ability could be passed on. The experiments spread widely from the eastern seaboard of the United States to Britain.

This movement drew its strength in effect from the reactionary beliefs of the 18th century where figures such as the Swedish philosopher Emanuel Swedenborg had begun his counter revolution of belief in a time of scientific rationalism and religious latitudinarianism. Although Swedenborg was influential he had a limited following in the United States. It was another movement, Mesmerism, which, having been far more popular in this country, provided the major basis from which Spiritualism had its origins. Mesmerism was primarily the creation of Franz Anton Mesmer, a German healer who used therapeutic hypnotism and the laying on of hands as part of his healing processes. It was the visions of the so-called spirit world that many of Mesmer's patients or *somnambules* experienced which generated a widespread fascination with Mesmerism. Spiritualism grew from the seeds of such occult attempts at re-enchanting spiritual activity. Within twelve years of the advent of Spiritualism the first photograph claimed to depict a spirit was produced in New Jersey (Guiley, p. 568).

It was the New Jersey commercial photographer W. Campb**ell** who produced the first recorded case of a spirit photograph apparently without his intervention in 1860. He showed his remarkable photograph to the American Photographic Society at their twentieth annual meeting. The image was a test photograph of a chair in which the trace picture of a small boy had mysteriously appeared. Campbell was at a loss to explain the appearance and was never able to reproduce such images again (Permutt,12). This would suggest that the appearance of the boy was not a staged effect. Curiously the rational answer should have been apparent to any practising photographer of the time. This was the period of the wet plate process where glass plates were coated with a photographic emulsion and exposed in the camera whilst still wet. As glass was not inexpensive plates were often cleaned and reused. The result might be the residue of a non-actinic (i.e. yellowish) image that though faint would produce a ghostly image if the plate were re-exposed. But according to Campbell the boy was unknown to him (Nickell, 148).

Far more famous a personality as spirit photographer was the Boston photographer William H. Mumler. Mumler was an engraver by training who worked for the jewellers Bigelow Brothers and Kennard. He appar-



Henry Mathouillot ArchivePartial Dematerialization of Medium M. Buettinger.
The Metropolitan Museum of Art, Gilman Collection, Gift of The Howard Gilman Foundation, 2005 (2005.100.383.4) Image © The Metropolitan Museum of Art.

ently discovered photographic extras on some amateur photographs he had taken of a fellow workman. This together with the popularity of Spiritualism seemingly provided Mumler with the impetus for exploring the idea of making such spirit photographs as a lucrative business venture. His Psychic self-portrait of 1862 as he accounted:

> was taken by myself, on a Sunday, when there was not a living soul in the room beside me, so to speak. The form on my right I recognise as my cousin who passed away about twelve years hence. (Nickell, 149)

Mumler's business venture thrived and he regularly obtained ghostly extras on the photographs he took of his customers in Boston. At the height of his career he could charge up to $10 per sitting. Nor did his popularity end when a Boston Spiritualist, a doctor Gardner, recognised some of the extras as living Bostonians. Although it damaged business Mumler was able to continue. On one occasion around 1865 Mumler even produced a manifestation of Abraham Lincoln. Mumler maintained that the woman who sat for him retained her veil until the moment of exposure when she removed it for the photograph. He did not he said, realise that she was in fact Lincoln's widow Mary Todd Lincoln (Permutt, 13).

The practice of spirit photography attracted its critics as well as those who were believers. Gradually a realisation that fakery was quite possible in the apparently immutable photographic image crept in. In 1869 Mumler was working in New York where he survived an accusation of fraud through lack of evidence. The accusations however were public notice that belief did not naturally follow the production of a plate. Despite producing a likeness of Beethoven in 1871 Mumler eventually died in obscurity around 1884 (Nickell, 149).

English spirit photographer Frederick Hudson on the other hand convinced his critics with his ability to produce spirit-extras with his own daughter as a medium. Publishing in the British Journal of Photography, July 11, 1873, one investigator John Beattie stated;

> If the figures standing by me in the pictures were not produced as I have suggested [i.e. real spirits appearing through the medium's presence], I do not know how they were there; but I must state a few ways by which they were *not* made. They were not made by double exposure, nor by figures being projected in space in anyway; they were not the result of mirrors; they were not produced by any machinery in the background, behind it, above it, or below it, nor by any contrivance connected with the bath, the camera or the camera inside. (Permut, 17–18)

As convinced as Beattie was, it is interesting to note that Beattie himself had successfully experimented with spirit photography prior to his investigation of Hudson,

Whatever the merits of each individual case what is truly fascinating is not the argument whether or not the works were fakes—most of them almost certainly were, but rather that there was such a huge desire to have this link with the deceased even when the evidence would indicate that the images provided no such thing. The sitters wanted the images to be real and the desire was enough to remove overwhelming doubt. When viewing the images themselves this becomes apparent.

Sometimes fuzzy, of varying scale, technical skill and unconvincingly dressed in shrouds it would seem almost impossible to believe that anyone could accept these images. However it would be wrong to project our own more sophisticated media scrutiny back upon these sitters. The photograph represented the real; there upon the plate where nothing had been before was a trace, a certainty of life beyond life. It was this photographic veracity this machine's verdict, that helped convince his sitters that this was a scientifically recorded truth.

The report of the fraud inquiry into Mumler's work suggested:

> A number of good recognitions were claimed from time to time by sitters, and these can only be accounted for in the light of subsequent events by the long arm of coincidence, and the will to believe that lies in all of us." (Nickell, 149). Especially, it might be added, when the evidence of a machine reinforces the will.

Importantly there was again the encounter between the Victorian understanding of the truth, i.e. the photograph, and the challenge of the unreal, "As visual spectacles and entertainment, such manifestations opened the way for the enjoyment of appearances whose very fascination came from their apparent impossibility, their apparent severance from the laws of nature" (Petro, 68). This type of photograph now offers clues not to the evidence of the afterlife but rather an insight into the Victorian mind and the complex puzzles of representation and implicit belief that the act of making a photograph evokes. As photographic knowledge progressed people were more and more convinced of the ability of the photographic 'medium' to access visual realms the eye could not see. The invention of the X-Ray by Karl Wilhelm Röntgen in 1895, understandings about the visible and invisible spectrum such as infra-red photography and the development of spectroscopy, reinforced such beliefs.

Sir Arthur Conan Doyle, Spiritualist and believer, defended the growth of this belief in paranormal activity. Doyle was himself convinced by the evidence he had seen over the course of his investigations.

> Victorian science would have left the world hard and clean and bare, like a landscape in the moon; but this science is in truth light in the darkness, and outside that limited circle of definite knowledge we see the loom and shadow of gigantic and fantastic possibilities around us, throwing themselves continually across our consciousness in such ways that it is difficult to ignore them. (Doyle, 13)

CHRIS WEBSTER

See also: Daguerre, Louis-Jacques-Mandé; and Mumler, William H.

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SQUIER, EPHRAIM GEORGE (1821–1888)

American poet, engineer, archaeologist, and photographer

Born June 17, 1821 in Bethlehem, New York, to Joel Squier, an itinerant Methodist minister, and Katherine Kilmer Squier, Ephraim George gained two half brothers—Charles Wesley and Frank— when his father mar-

ried Maria Kilmer, Squier's own mother's sister after Katherine's death when Ephraim was twelve.

As a young man he wrote poetry and edited several poetry journals. His literary interests switched from poetry to social issues when he became involved with a publication, *The New York State Mechanic*, which supported "...the interests, rights, and social advancement of the laboring classes of America," according to his biographer, Terry Barnhart. Squier went on to obtain an M.A. and a degree in Civil Engineering.

Squier's interest in archaeology began in 1845 with his writings about the Indian mounds in Chillicothe, Ohio, and culminated in one of his most important works *Peru: Incidents of Travel and Exploration in the Land of the Incas,* published in 1877. This extensive record includes 295 engravings based on drawings and photographs—using the wet-plate process—made under Squier's supervision by the Lima based photographer Augustus Le Plongeon, who also probably taught Squier basic photography, a photographer named only as "P," and even Squier himself. His use of photography served him well because the renderings of architectural plans and monuments remain accurate even today.

Some of Squier's other significant works include *Nicaragua: Its People, Scenery, Monuments, and the proposed Inter-Oceanic Canal*, published in 1852, and *Observations on the Uses of the Mounds of the West, With an Attempt at their Classification,* published in 1847.

Ephraim George Squier died April 17, 1888 in Brooklyn, New York. The Library of Congress, the New York Historical Society, the Indiana Histroical Society, and the Latin American Library of Tulane University, are some of the institutions that hold Squire materials and photographs.

MICHELE M. PENHALL

STAHL, THÉOPHILE AUGUSTE (1828–1877)

Born in Bergamo, Italy, on May 23, 1828, Théophile Auguste (Augusto) Stahl came from an Alsatian family. His father was a Lutheran pastor. Stahl arrived in Pernambuco, Brazil in 1853, and in 1862 moved to Rio, where he and Germano Wahnschaffe became Photographers of the Imperial House. A renowned landscape photographer who sold multiple copies of his prints, he portrayed remote parts of Pernambuco, documented the Recife and São Francisco Railway works and recorded Emperor Pedro II's visit to Recife in 1859. The resulting album, "Memorandum Pittoresco de Pernambuco," is considered a pioneering example of photojournalism. Stahl also produced anthropological and anthropometric pictures of "Brazilian types" for the Agassiz expedition (1865–1866), published in *Journey in Brazil,* by Louis and Elizabeth Agassiz (1868). He participated in the First and Second National Exhibitions in Rio (1861 and 1866), the Great London Exposition (1862) and the Exposition Universelle, Paris (1867). He died in Alsace on October 30, 1877.

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SABRINA GLEDHILL

See also: Exposition Universelle, Paris; and Expedition and Survey Photography.

STANHOPE

A Stanhope, sometimes called a peep, is a microphotographic image on glass attached to its own small magnifying lens. The construction allows a person to see the image clearly. Stanhopes were produced from the 1860s to the 1970s, primarily in France. They can be found in a variety of decorative, souvenir, and utilitarian objects that were manufactured and distributed around the world.

Microphotography is nearly as old as photography. In 1839 John Benjamin Dancer produced some of the first microphotographs on slides. After collodion came into use in the 1850s, microscope slides became more popular, but people needed an easier way to see the images. Sir David Brewster used the more portable Coddington lens, invented about 1820, but suggested microphotographs could somehow be mounted into jewelry. René Prudent Patrice Dagron was issued a French patent in 1859 involving the use of microfilms and lenses to be placed in novelty items. He produced Stanhopes as we know them today, referring to them as microscopic jewels. He also used the term "Stanhope."

Stanhope is named for Charles, Third Earl of Stanhope (1753–1816), an inventor who lived prior to the era of photography. He did not invent the Stanhope, but he had developed a hand-held lens on which the Stanhope is based. Charles Stanhope's lens had two rounded ends, but Dagron made one end flat so that he could attach the image directly to it. In this way he was able to place the units into holes in novelties so that people could carry them in a fashionable manner.

The images were produced by using a camera with microscope lenses. Although the first cameras had one lens, the later ones had as many as twenty-five. Through these lenses photographic images were made onto a microscope slide by using the collodion on glass process.

By moving the lenses horizontally and vertically it was possible to produce 450 images on one slide. These were then cut into individual square parts with a diamond tool creating images about 1/30 inch square. Onto each image was glued a tiny lens, 1/4 to 1/3 inch in length, and then the corners of the glass unit were ground off making the unit cylindrical. The glue used was Canada balsam which was clear when it dried. The finished piece is usually about 1/10 inch by 1/3 inch, though some Stanhopes were made in larger sizes.

The focal length of the lens equals the length of the lens, so to be in focus, the image must be in direct contact with the flat end of the lens. To view the image, it is necessary to hold the curved end very close to your eye and direct the flat side of the lens toward a light source. Sometimes this is best with direct light, but in other instances diffused light or light reflected off a white surface is best. Since the Stanhope contains its own magnifying lens, most people find it easier to view without the aid of eyeglasses. Often many scenes will appear in a Stanhope, but if there is a single lens it is still only a single Stanhope image. In a real multiple Stanhope item there will be different lenses for each Stanhope.

Today the term refers to both the images and the items containing them. Images can be souvenir sights, religious locations or prayers, political personalities, advertising information or nudes. Certain types of items tend to be from specific geographic regions. Satin spar barrels or similar objects have Niagara Falls images. Items of bog oak come from Ireland. Hoof or horn objects come from Austria or Switzerland and have mountain scenes. The age of many Stanhopes can be determined because the images commemorate datable events. These include celebrations, famous exhibitions and world's fairs. Political Stanhopes also can be dated by establishing election years for the people pictured.

Stanhopes appear in a great variety of articles. Most abundant are crosses, which always have some type of religious image. Common, too, are dip pens and letter openers made of carved wood or bone. The images included are usually locations since these were travel souvenirs. Miniature bone binoculars and telescopes, with nearly every type of image, also are frequently found. Less common are sewing and needlework implements, smoking items, jewelry, writing instruments, bookmarks, grooming tools, knives and assorted other trinkets. Canes, beer steins, and violin bows are among the larger items one can find with Stanhopes. Although some museums have a few Stanhopes, none permits viewing the images. It is possible to do this only in private collections.

The largest and most valuable Stanhopes are dolls. Fewer than twelve are known to exist, all in museums or private doll collections. These dolls are all attributed to Antoine Edmond Rochard, who gained a French patent for them in 1867. They were produced through the 1870s. Most of them have multiple Stanhopes which appear in the bisque bodice. Some of the Stanhope lenses in these dolls are larger than those usually found. The known dolls are all different, varying in looks, height and necklace design. The number of Stanhopes in the dolls ranges from a single one to the thirty in Miss Jewel, owned by the Margaret Woodbury Strong Museum in Rochester, New York.

Several problems can occur in Stanhopes. The lenses sometimes fall out of their housings or the plate with the collodion image separates from the lens. This can be due to the deterioration of the Canada balsam which can dry out. If an item is washed the image will usually be lost because of separation. Sometimes the Canada balsam darkens. At other times bubbles appear in the image, but this probably happened in the production of the unit.

Stanhopes are no longer made, partly because the entire process was labor intensive. The last known Stanhope lens factory, in France, closed in 1972. For awhile they were produced in parts of Eastern Europe. In the twenty-first century people are fabricating images that they call Stanhopes, but they are not traditional Stanhopes.

BOBBI LONDON

See also: Brewster, Sir David; Dancer, John Benjamin; Photographic Jewelry; and Microphotography.

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STEICHEN, EDWARD (1879–1973)

Edward Steichen, born Eduard Jean, Luxembourg, immigrated to the United States in 1881. At 16 he took up photography in 1895 while studying painting at the

Milwaukee Art Students League and on his apprenticeship in lithography, first exhibiting photographs in 1899 at the Second Philadelphia Salon. While few have achieved so many different careers in photography, he seems no longer to be accorded the status he had in his lifetime. The accusation that he kept changing horses for financial reasons may have stuck to his reputation: it is indeed hard to image that his fashion and advertising photography of 1923 onwards for Condé Nast is the same person as the painter and photographer protégé of Alfred Steiglitz, as the man who persuaded Steiglitz to open the 291 gallery in New York; the same photographer (more and more esteemed today) of those Whistler diffused images when he was a member of the Linked Ring (1901) and the Photo-Session (founder member 1902); the exclusive aesthetic interpreter of Rodin, one of the first photographers involved with colour, using autochromes as early as 1904. Pictorialist Steichen, still a painter then, also depicted brooding landscapes. These early Steichen's, essentially developed out of 19th century aesthetics, may well turn out to be his golden period rather than his conversion to 'Straight,' then to 'commercial art,' or that he became curator at the Museum of Modern Art in New York (1947–62), and of the most successful photography exhibition ever held: *The Family of Man* (1955). He was also a successful breeder of delphiniums, an equal art, he would have maintained.

ALISTAIR CRAWFORD

STEINHEIL, RUDOLPH (1865–1930)

Lens craftsman

Rudolph, the son of Adolph Steinheil, was the third and last member of the famous dynasty of lens makers. An accomplished lens designer in his own right, he took over the management of the business in 1893, when he was just twenty-eight, following his father's sudden death.

Rudolph became responsible for the scientific direction of the firm at a time when photographic optics were undergoing enormous changes following the introduction of new optical glasses such as those produced by Schott and Abbe at Jena. He designed a new anastigmat lens and two different types of orthostigmat lens, followed by a number of other lenses, including the Unofocal in 1901. Perhaps his greatest achievement was in the design of lenses for astronomy. He constructed several large telescopes for observatories in Germany and other parts of the world. In 1910, he collaborated with Carl Goerz in setting up the Sendlinger Glassworks in Berlin.

COLIN HARDING

STELZNER, CARL FERDINAND (1805–1894)

Carl Ferdinand Stelzner was born in 1805 in Flensburg and adopted by Carl Gottlob Stelzner in Flensburg. He married this man's daughter Caroline Stelzner in 1834. Both were successfully working in Hamburg since 1830 as miniaturists and portrait painters. In 1842 he opened a photographic studio together with Hermann Biow but the partnership was dissolved in 1843. When the city of Hamburg burnt down in 1842, the studio of Biow & Stelzner produced a series of photographs showing the ruins. Carl Ferdinand Stelzner's fame was for being the first and, for a long time, the best photographic portraitist in Hamburg. A noted miniaturist before taking up photography he knew how to find the moment of expression in his clients' faces, and even today his portraits are a lot more vivid than those of his contemporaries, Hermann Biow included.

His specialities included group pictures which he managed to arrange in very lively settings. For the 15 years Carl Ferdinand Stelzner practised photography he was virtually unsurpassed as a portraitist in the German countries; even as a blind man he remained a well heard spokesman in Hamburg's photography. Due to being blind since 1854, Stelzner's studio was sold in 1858 to Oskar Fielitz from Braunschweig, a year later to Heinrich Gustav Siemsen. Carl Ferdinand Stelzner died on October 23, 1894.

ROLF SACHSSE

STEREOGRAPHIC SOCIETIES

The history of any society or organization is also a history of the people and times within which it exists. Stereographic societies make particularly interesting reading, as their members have proved to be amongst the most active and multi talented of all photographic groups.

The Stereoscopic Club, formed in 1891, was the earliest stereographic group in the world. It was founded by Mr W.I. Chadwick, and it survived until 1905. Its remaining members then moved into The Stereoscopic Society, originally formed in 1893 as The Stereoscopic Postal Exchange Club.

This society offered a wider variety of opportunities and activities, such as meetings and distributing folios of stereo view cards, by post. In 1896, it changed its name to The Stereoscopic Society so as to better represent its members overall interests in Stereoscopic imaging. Its Founder/Secretary was Mr Charles Berti DiVeri. Its first President was Mr W.A. Whiston, followed by the illustrious Dr W.W. Stainforth.

Today, The Stereoscopic Society thus remains as the

oldest extant stereographic society in the world, with a thriving international membership.

In 1894, it became affiliated to The Photographic Society of Great Britain, later called The Royal Photographic Society, and over the next 100 years, they organised many exhibitions and published many articles.

No other independent stereographic societies existed until 1903, when the 'Stereo Club Francais' (SCF) was formed by Monsieur Benjamin Lihou. The club still exists.

Various stereo view card manufacturers, such as Underwood and Underwood, The Keystone View Company- and later ViewMaster- also had enthusiast stereographic groups within their own manufacturing organisations, but were little known outside their own companies.

Meanwhile, The Stereoscopic Society, based in England, encouraged international membership, and so, in 1919, The American branch of The Stereoscopic Society was the first overseas branch to be created, with Mr W.S. Cotton as secretary. Formation of the Australian branch (Secretary H.A. Tregallas), and New Zealand branch followed in 1924/5.

Other overseas branches followed, with autonomous international, national and local and independent societies, growing along the way. Some major national photographic organisations included stereographic groups within their edict. These included The Royal Photographic Society, and the Stereo Division (founded 1951, Chairman Dr Frank Rice) within the Photographic Society of America. Famous local stereographic societies included The Beverly Hills (California) Stereo Club (founded Sept. 1952), which had many Hollywood film star members.

Meanwhile, independent but countrywide stereographic groups formed, often in demand to a local need. These included The Third Dimension Society (founded 1963, Chairman James Milnes), The National Stereoscopic Association (1974). Also, The International Stereoscopic Union (1975) which encompasses many other societies as its members.

The Stereoscopic Society remains typical of the societies, with 15 specialist groups distributing folios of stereo view cards, slides and information to its members. Over a century since its formation, it runs regular meetings, projection sessions, training sessions, conventions, library service and advice.

DAVID BURDER

See also: Royal Photographic Society.

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STEREOSCOPY

A stereoscope is an optical device used for viewing images in three-dimensional depth.

Two photographs are taken of the same scene but from a slightly different angle. This recreates the illusion of depth in the same way as the human eye. Our eyes are set about 2.5 inches (6.5cm) apart. Each eye sees a slightly different field of vision. When these views are combined an affect of binocular vision is created, giving depth height and distance to our view. If the lenses of a camera are set 2.5 inches (6.5cm) apart when taking two photographs, the same illusion can be created when these images are placed 2.5 inches (6.5cm) apart, and viewed simultaneously through a combination of lenses and prisms called a stereoscope.

It may come as a surprise that stereoscopy pre-empted the invention of photography. The concept for the stereoscope was first discovered by Sir Charles Wheatstone (1802–75). Wheatstone was a physicist and professor of experimental philosophy. Among other things, he discovered how to send the electric telegraph and helped create the modern dynamo. He started his career working as a musical instrument maker. It was in 1832 that he first invented the Stereoscope and presented these findings in 1838, a year previous to Daguerre's photographic discovery of the daguerreotype. Describing his instrument he said:

> I propose that it be called a stereoscope, to indicate its property of representing solid figures.

Wheatstones's, *Reflecting Stereoscope* is demonstrated in the diagram. Two pictures were fixed vertically at the end of a bar facing mirrors at right angle to each other. The images were usually of a large size and one could view the images simultaneously with each eye seeing one image. The instrument was successful in showing geometric drawings but not in showing portraits, landscapes and architecture. This original stereoscope remains at the Science museum, London. In c. 1841, Wheatstone approached the early photographers of the time Richard Beard, Henry Collen, Antoine Claudet and H.Fizeau in Paris and requested that they use his apparatus to view daguerreotype photographs. This was unsuccessful as the metal surface created too many reflections. Calyotypes were more successful especially with pictures of large objects. Good large examples were taken by Fox Talbot, Dr Percy, BB Turner, Alfred Rosling and Roger Fenton, some examples of which were on sale in 1846 in the shop of James Newman, Soho Square, London. Wheatstone's process was both expensive and time consuming. In March 1849, Sir David Brewster (1781–1868), presented his invention of the Lenticular Stereoscope to the Royal Society of Edinburgh. This was a modification of the second stereoscope plan by Wheatstone. Two images were viewed in a box

through a pair of prisms, which magnified the binocular image. The height of the images was usually limited to three inches. Brewster exhibited the first model made by Andrew Ross at the British Association Meeting in 1849, and suggested it should be applied to photography. It was slow to catch on at first and he struggled in vain to attract several English opticians to manufacture the instrument. In 1850, Brewster took his stereoscope to Paris where, the author Abbe Moigno was very impressed by the idea and presented it to Jules Dubosq, an optician who suggested producing transparent pictures on glass and replacing the solid bottom with a glass screen. At the Great Exhibition, The Crystal Palace, 1851, a number of stereoscopes made by Dubosq were shown as well as a set of stereo daguerreotype. The effective illusion of the instrument caught the attention of Queen Victoria. This prompted Dubosq to make an elaborate stereoscope for the Queen.

The fascination with this novel instrument soon spread to the general public. Dubosq had many orders and opticians in England started to manufacture stereoscopes. Among the photographers who worked with stereo daguerreotypes were Claudet, Beard, Mayall, Kilburn and Williams. They all took pictures of the Crystal Palace and its exhibits. One of the figures most responsible for the popularity of the stereoscope and for its scientific improvement was A. Claudet (1797–1867. Claudet showed a collection of stereo daguerreotypes at the Great Exhibition, which greatly impressed the Queen. In 1852, Claudet published his first paper on the subject: *On the Stereoscopometer and on a Manifold Binocular Camera* (British Association for the Advancement of Science reports 23 no.1 1852,. 6). The stereoscopometer was an instrument used to measure the position of the two cameras, relative to the subject, in order to achieve a good stereo effect. The *binocular camera* was a special camera for taking stereo daguerreotypes, which had two lenses. Unlike many others photographers Claudet adapted stereo daguerreotypes to portraits and even groups with great success and achieved a very a life like quality. Claudet's portraits were taken with painted backdrops, as this was thought to give the stereoscope a more dramatic three-dimensional affect.

An example of Claudets portrait stereos is *The Geography lesson c 1853* which was referred to in the *Illustrated News* as a charming part of the Gernsheim Collection. The complex composition is made up of a group of figures at differing heights, around a globe in the centre. There is a balance of all elements of the composition. The figures are lower in the foreground and raised in the background. Claudet used this formula for many of his elaborate stereo group portraits, which he called his 'conversationals.' The depth of such a complex portrait can only be fully appreciated when seen through a stereoscope, where the characters are brought to life and given three-dimensional form. Before the invention of the binocular camera, Claudet produced his stereos by setting up two cameras side by side, which accounts for the exaggerated roundness of the figures.

In 1852 J.F. Mascher from Philadelphia invented a miniature case which had on one side the folding stereoscope and on the other a stereo image. In 1853 Claudet gave a lecture at the Society of Arts entitled 'The History of the Sterescope and its photographic Applications.' For the promotion of this area of photography he received the Society medal from the President Prince Albert.

In March 1853 claudet patented a folding pocket stereoscope, in which one stereoscopic daguerreotype was fitted in a case with two lenses. When opened it formed a stereoscope.

A drawback of Brewster's and Dubosq's design was that eye pieces were not adaptable to different eye widths or to different sight. In 1855 Claudet patented an instrument where the lens was set in adjustable tubes. This patent also covered a *large revolving stereoscope*, where one hundred slides could be rotated on a band.

In 1858 Claudet presented his *stereomonoscope* to the *Royal Society*. The instrument combined stereo images on a large glass screen which allowed several viewers to watch at a time, pre-empting cinema.

Before the invention of moving image, at the beginning of the nineteenth century, stereoscopy provided a new and exciting way of seeing the world. This was an ideal medium for travellers to present scenes of places that most people had never seen and to re-create a visual illusion of such scenes. The stereoscope was as common in American homes as the TV is today. People who had never been able to travel could escape to far away places. Stereoscopic pictures were used as travel guides and educators. People could sit in their own homes whilst touring the world with views of the countryside, ancient Egypt, sights from New York or San Francisco. Great events were brought into peoples living rooms. Natural desasters such as the Johnstown flood or the San Franscisco earthquake could be recorded for the first time. Both the Chicago Worlds Fair in 1892, and the St Louis Worlds fair in 1904, could be enjoyed by those who were not even there. A. Claudet described the stereo daguerreotype:

> The general panorama of the world. It introduces to us scenes known only from the imperfect relations of travellers, it leads us to the ruins of antique architecture, illustrating the historical records of former and lost civilisations; the genious, taste and power of past ages with which we have become as familiarised as if we had visited them. ('Photography in its Relation to the Fine Arts,' *The Photographic Journal*, vol. Vi, 15 June 1860)

The invention of the stereoscope marked an important step towards the invention of moving image and for many years Dubosq, Claudet and other pioneers worked

to combine the stereoscope with the zoetrope to create 'moving photographic figures.' Claudet created an instrument where a slide was adapted to the eye piece of the stereoscope. This moved backwards and forwards opening and closing each eye piece. One view shows a man with a cigarette in his hand and the other with the cigarette in his mouth. Moving the slide backwards and forwards across the eye piece, gives the impression that the sitter, A.Claudet, is smoking. Claudet explained this as 'an uninterrupted perception of an object in motion.' This experiment was based on the understanding of how the eye works. Arthur Gill described this as the first photographic device specifically giving an illusion of movement. Arthur Gill 'Antoine Claudet Photographer,' M*odern Camera Magazine,* Nov. 1961 462. Said:

> together with Dubosq his is the honour of having laid an important foundation stone on the edifice of motion pictures.

Claudet knew that the retina retained some of the previous image after viewing. The eyes were able to supply the in between images by the persistence of vision. Claudet elaborated on this idea, showing an arrangement of a series of pictures on blades on a rotating band. This gave an illusion of movement when looked at through the stereoscope. He applied this idea to Plateau's Phenakistoscope in 1865, but failed to achieve a smooth illusion of moving image.

In America daguerreotype photography and stereo daguerreotypes experienced a long duration of success. By the 1850s a town called Dagurreville had appeared in America around a factory which produced three million daguerreotype plates a year. In fact, there were more studios in New York than in the whole of Europe this was due to the more relaxed licensing laws. 'Southworth and Hawes were a successful American studios who produced many stereo daguerreotypes. In an article by the Philadelphian daguerreotypist Marcus A.Root, August 1855 for the *Photographic and Fine Art Journal,* 'A trip to Boston—Boston Artists,' he wrote that:

> Mr Southworth explained the wonders of the stereoscope very clearly, and he takes his pictures of this class without distortion or exaggeration. I think his principle correct, for his specimens were stereoscopically beautiful, and exempt form the many faults witnessed in those of others…They have also invented and patented a beautiful instrument, by which 24 or 48, or even more (stereoscopic) pictures-taken either upon plate, or paper, or glass,- are exhibited stereoscopically; and so perfect is the illusion, as to impress the beholder with the belief, that the picture is nature itself!

Many stereos were sold in sets, and most were of buildings and scenery. The size varies but the most common viewers were 7 × 3.5 inches (18 cm x 9 cm), the images were both about 3inches square (7.6cm square). Stereoscopy became the first in a line of photographic crazes. Within the first three months after Albert and Victoria had taken a shine to the new phenomena, a quarter of a million stereo viewers were bought in London and Paris. The stereoscope experienced its peak of popularity in the 1850s and 1860s. It was estimated that by the mid-1850s over a million homes had one. By 1860 almost every Victorian family of the middle classes had a stereoscope and a collection of photographs to go with it. Many beautiful stereo daguerreotypes were produced in the 1850s but the metal plate was fragile and heavy and not suited to the medium. The plates were expensive to make and the reflections on the surface often interfered with the three-dimensional effect. Once the collodian photographic process was established sterescopic photography received a boost in popularity. Paper prints could be mass produced and were much cheaper than their daguerreotype predecessors.

The most common process for making stereos was the stereocards with the Albumen process. The number of stereo daguerreotypes produced was relatively rare. In 1854 George Swann Nottage set up the London Stereoscopic Company, manufacturing sterescopes and binocular pictures and was one of the largest manufacturers in England. He had 10.000 stereocards on offer in 1854. By 1858 he had increased this to a stock of 100,000 stereos of places of interest in both England and abroad. Within two years they had already sold half a million instruments. His ambition was for there to be no home in England without a stereoscope. With his fortune George Nottage became the mayor of London. Magazines were started up which had stereo images and clubs were formed where people got together and showed swapped and collected stereos. The stereoscope was to Victorians what the television is to us today. Stereo cards were the cheapest type sold at half a crown for three. By the late 1850s there was a trend for dioramas where thin paper could transmit light. Even mundane objects fascinated people by the the apparent reality viewed through the lens. Stereos could be sold of all sorts of subjects, ghost pictures freaks and risque nudes. Paris was one of the biggest exporter of stereos in this genre. Most were taken by photographer who kept their identity anonymous. Due to the strict moral climate in England and America at this time such photographs were considered pornography and were not thought of as acceptable as nude painting.

Soon a variety of viewers became available. The cabinet viewer could store up to 50 positives. Eventually one of the widest used stereoscopes was that invented by American writer Oliver Wendell Holmes designed in 1860. It was cheap to produce and easy to use. The structure which was like a mask, was held in front of the eyes by a handle below, like a lorgnette. There was a piece going across on a runner to support the cards.

This could be moved up and down until the picture was in focus. More elaborate models were mounted on a stand. This type of stereoscope continued to be used into the twentieth century. By the 1920s the stereoscope lost its charm and went out of favour as the most popular form of entertainment. Stereoscopes were eventually eclipsed by the introduction of *carteomania*, the craze for the c*arte de visite*, small portraits on cards 2.25 × 3.5 inches, an invention which had been developed by the French photographer Andre Disderi in 1854. Despite this stereoscopy continued to have revivals in popularity well into the twentieth century. Present day stereo cameras can be bought and modern stereoscopes consist of a plastic box with two viewing holes. *The Sterescopic Society* was formed in 1893 and continues to promote stereo photography today. Stereoscopy is still used for aerial surveys to map out land elevations and for astronomers to view small planets.

LAURA CLAUDET

See also: Wheatstone, Charles; *Illustrated News*; and Daguerreotype.

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STEWART, JOHN (1800–1887)

John Stewart lived and worked for many years in Pau in the Pyrenees from 1847 and for a time in the 1850s, was associated with an informal grouping of photographers who referred to themselves as the 'ecole de Pau.' That group included Stewart's frequent photographic companion Maxwell Lyte.

The group produced impressive and often romantic landscapes, sometimes placing people strategically within the frame to counter the spectacular mountain scenery.

He was one of the exhibitors at the 1852 photographic exhibition at the Royal Society of Arts in London, and an early member of both the Photographic Society of London, and the Societé française de photographie. Stewart was brother-in-law to Sir John Herschel, and Herschel wrote about his work in the 'Atheneum' in 1852, alongside Stewart's own account of his experiences.

He exhibited work at the Photographic Societt of London's 1855 exhibition, but with one exception, he thereafter appears to have exhibited only in France. That date coincides with him joining the Societé Française. The exception was a portrait of his brother-in-law exhibited at the 1857 Manchester Art Treasures Exhibition.

In 1853 and 1854 he published accounts of a 'new photographic process,' and it was examples of his 'wet paper process' which he exhibited in 1855.

JOHN HANNAVY

STIEGLITZ, ALFRED (1864–1946)

American photographer, creator and editor of* Camera Notes*, and founder of the 291 Gallery

Alfred Stieglitz is remembered through his remarkable photographic work, his involvement in the photo secessionist movement, and his pivotal involvement in the fostering of an academicization of photography in America. His work made great strides to promote the symbolic in American art and elevate the position of photographer to that of fine artist, as opposed to a skilled craftsman who is merely technically proficient.

Stieglitz, the first son of four children, including two male twins, was born in Hoboken, New Jersey, on 1 January 1864 to hard-working Jewish parents. Alfred's mother, Ann Werner, who moved to the United States in 1852 and married Edward Stieglitz, Alfred's father, on 21 December 1862, was an educated woman fond of literature and the arts. Alfred's father made it a point

not to mix home life with business life; he preferred to have his home filled discussions of the arts. As a result, Alfred enjoyed a home environment full of discussions of literature and the arts as well as meetings with well-known artistic and literary figures.

Alfred grew up next to the Elysian Fields in Central Park, home to the invention of modern baseball and inspiration for a lifelong love of the game. Stieglitz identified with his subject, a notion that traced back to his childhood experience of bringing food to an organ grinder because Stieglitz identified with the organ grinder. During the 1870s, Alfred saved money and brought a sandwich to an Italian organ-grinder and his monkey, who played outside Stieglitz's house every Saturday. Years later, Stieglitz confessed to his mother that "I was the organ-grinder." Stieglitz often affirmed that whenever he took a photograph he was photographing himself—regardless of its ostensible subject—so that all his photographs were, in effect, self-portraits that conveyed symbolic representations of his and the symbolic representations of his feelings. Alfred would cultivate intense jealousy of the twin boys.

For a good part of the beginning of his career, Stieglitz believed in what is called "straight photography," as opposed to unusual visual effects achieved, among other means, by the manipulation of negatives and chemicals. This later proved seemingly ironic as Stieglitz became one to rely heavily on manipulation of photographic images. However, at the heart of his photographic creations, Stieglitz never wavered from sticking to the fundamental emulsion, lens, and camera qualities. Throughout his career, Stieglitz photographed primarily in the open air.

Lake George, near the Finger Lakes in upstate New York, was a favorite haunt of both Stieglitz and his family, where they often spent their summers, and also the site of many of his photographic images. New York City was an equally important focus of Stieglitz's work. Works such as "Winter on Fifth Avenue" (alternately referred to as "Fifth Avenue, Winter") and "Spring Showers" captured the atmospheric environment of the inner city in a way that previous mediums had been (lacking)/wont to do/capture. Other works, such as "Spiritual America," depicting a gelded or castrated horse captured the spiritual void being created by modern American commercialism and manifested in a crisis in American masculinity. Stieglitz's work, "The Steerage" (1907), on the other hand, dealt alternately with geometric forms constructed in spatial planes within a photographic frame and issues of social class and gender differences.

In 1905, Stieglitz established the famous gallery 291 named for its location at 291 Fifth Avenue in New York City. The gallery was designed to be a location for the exhibition of photography as a fine art in America. Yet, soon after opening, the gallery broadened its scope to include the works of the modern French movement and introduced to the United States the work of Cezanne, Picasso, Braque, Brancusi, and many others. It also made known the work of such American artists as John Marin, Charles Demuth, Max Weber, and Geogia O'Keeffe, whom Stieglitz married in 1924.

Stieglitz moved freely from these works into his photographs of his second wife, painter Georgia O'Keeffe. The nude photographs Stieglitz composed of O'Keeffe's hands, face, chest, and body were the content of a one-man show at his 291 gallery. Ironically, these photographs of O'Keeffe's body, not her body of work, are what brought her attention.

With the demolition of the building 291 occupied, the Photo-Secession ended in 1917. However, the most of its members had already effectively left the group either as a result of personal conflicts with Stieglitz or new ideas about where the movement should be headed.

Never one to tolerate a seeming imperfection in his past, Stieglitz, who maintained a near-obsessive passion for his body of photographic work, attempted to destroy all of the material he produced for Camera Work. However, after Stieglitz happened to communicate with the director of the Metropolitan Museum of Art, the MET decided to collect all of Stieglitz's remaining works from the Camera Work era. This collection would later be incorporated into a separate library within the MET.

Retouching portraits had been common in the collodion era, but after 1917, new art critics were calling for a "straight photography." Straight photography came to refer to art critics desire for an art that relied on the photographer's eye, instinct, knowledge of composition and inherent good taste as opposed to special effects such as retouching. While retouching was necessary procedure for the majority of daguerreotype images as they were fragile, it was not a requisite for modern photography that could now be produced on sturdy papers and could withstand less cautious handling.

Stieglitz sought to produce an art free from the pressures of rampant commercialism. He felt that, unlike in Walt Whitman's era, the then-current day presented a world where advertising and commercials took the place of American imagination. Throughout his life, He tried to spread the idea that art is not property and should be accessible to all.

In 1922, Stieglitz began a series of abstract photographs entitled "Equivalents," or abstract works composed primarily of clouds, atmosphere, and light, in which cloud formations create various moods and textures. He referred to them as his attempt to "put down my philosophy of life—to show that photographs were not due to subject matter" (Newhall, 171). Stieglitz always saw these photographs as a reflection of himself in some way.

Stieglitz's circle, a group of artists who all had exhibited at 291 before the gallery's demolition, combined the Whitmanian notion of nature as health-giving and unifying with an aesthetic philosophy taken from the socialism of William Morris and the Arts and Crafts movement. Stieglitz's determination for high-quality art photography to reach an international audience was proven in his correspondence with Lewis Mumford, the editor of the international art journal with a socialist slant, the *Dial*. Stieglitz desired to have photographs entered into the *Dial* and thereby have well-produced photographs reach an international audience.

From 1917 until approximately 1925, Stiegliz produced some of his best known works including the extraordinary portraits of O'Keeffe, studies of New York, and the "Equivalents," or great cloud series. From 1925 until 1930, he operated the Intimate Gallery (1925–1930) and An American Place (1930–1946), which both sought to further the conceptual advance gained by the exhibitions that occurred with the photo secessionists with 291.

SARAH B. WHEELER

See also: Art photography and aesthetics; Daguerreotype; Frank, Eugene; Kasebier, Gertrude; Photography as a profession; Portraiture; Printing and contact printing; Sky and cloud photography; Steichen, Edward J.

Biography

Alfred Stieglitz was born on 1 January 1864 in New York City. He took up photography in the early 1880s while living in Berlin, Germany. In 1901, he founded a society of American pictorial photographers, the Photo-Secession, based firmly in New York, and he created the journal *Camera Work* in which to display the work of the Photo-Secessionists. Stieglitz was one of the founders of the pictorial movement and an advocate of straight photography, or photography that strove not to alter the photographic image after the image was captured. Stieglitz, who first displayed works of Brancusi, Braque, Rodin, and Matisse in his 291 gallery, is credited with awakening the American public and critics to modern European movements in the visual arts. Often claiming that truth was his obsession, Stieglitz sought not to alter the image after it was captured by the camera. He began a series of photographs of Georgia O'Keeffe, American painter and feminist, who would later become his wife, and launched a one-man show in his 29' gallery entirely of portraits of O'Keeffe. After the closing of 291 and the termination of *Camera Work*, Stieglitz opened the Intimate Gallery, consisting of rooms "at the Anderson Galleries to promote the work of a circle of American modernists in painting and photography that comprised, besides himself, Arthur Dove, Marsden Hartley, John Marin, O'Keeffe, and Strand" and ran the space from 1917 and 1925. Beginning in 1913, he made a series of abstract photographs entitled "Equivalents," the majority of which focused on clouds and atmosphere, to illustrate what he felt were nature's equivalents to his philosophy of life. A number of these "Equivalents" were photographed at Lake George—a site of interest to the Hudson River School painters such as Thomas Cole, Albert Bierstadt, Frederic Edwin Church, and Thomas Moran—where Stieglitz summered. His work in this later period includes portraits, hundreds of studies of Georgia O'Keeffe, photographs of Lake George, clouds, and New York City views. Stieglitz ran *An American Place*, in which he exhibited principally painting, sculpture, and graphic work, and occasionally photography, from 1929 until his death on 13 July 1946.

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STILL LIFES

Still life was a popular theme for photographers during the nineteenth century for a number of reasons. Technologically, the long exposure times required to capture an image on a light-sensitive surface meant that moving subjects were impossible to register until at least the 1860s. Still lifes, however, allowed photographers the greatest degree of control over their subject. In the

early years of the medium, the emerging photographer could experiment with lighting, timing, tonal qualities, texture and subject arrangement without interruption or complaint from a live subject.

The natural world was also of great interest to nineteenth-century photographers. One of the principal inventors of photography, William Henry Fox Talbot had a scientific interest in nature and natural phenomena, including botany. For Talbot, photography was a physical manifestation of the wonders of nature, a working tool, a unique recording system and an art. In his first book of photographs, *The Pencil of Nature* (1844), he hoped to show how nature might 'draw' or 'fix' itself on paper. The term 'photography,' literally means 'light drawing' or 'light writing' and in *The Pencil of Nature* Talbot gives an account of photography in relation to painting and its traditions.

Talbot hoped that photography would be an aid to scientists and to artists in their attempts to represent the world. From this time, the extent to which photography continued to be understood in relation to the arts was hotly debated. During the second half of the century, painting exhibitions were often reviewed and discussed in photography publications. Photography's role was frequently a central focus of photographic societies' meetings and discussion centred on what constituted acceptable themes for photographers in order to legitimise their work as Art. In the earliest years after the medium's invention, the acknowledged topics included landscapes, cityscapes, portraiture and still lifes.

Historically, still life is an ancient genre, traditionally associated with the medium of oil painting. By definition, still lifes are an arrangement of inanimate artefacts, often food (especially fruit and dead game), plants and textiles, for example. The composition of still lifes can range from highly elaborate displays to simple arrangements, posed within a domestic setting. While still lifes are most often a subject of painting, throughout history other media have been used, including mosaics, watercolour, collage and, of course, photography. Some of the earliest known images that can be described as still lifes have been found in ancient Egyptian funerary painting.

Despite the existence of still lifes in Greek, Roman and Renaissance art, the form emerged as an independent subject in the West only in the sixteenth century. The genre was highly regarded by artists such as Carravaggio, who elevated still life to a status that was more than merely decorative. Still lifes flourished in seventeenth century Dutch painting where sumptuous arrangements of food, flowers and objects celebrated nature as well as Christian, philosophical and metaphysical ideas. The flora and fauna of exotic places was also a popular still life subject. As historians such as John Berger note, still lifes embody a moment in the history of art where merchandise becomes subject matter in itself.

Frenchman Jean-Baptiste-Siméon Chardin is celebrated as the most notable early still life painter during the peak of the genre's popularity in Europe, in the eighteen century. Still lifes were especially popular in France, Spain and Italy at this time and were often included in *tromp l'oeil* paintings. By the early nineteenth century in Europe there was little demand for still life painting. However, it received a boost in the region through the still lifes of much-famed artists such as Gustave Courbet, Francisco de Goya and the Impressionist Paul Cézanne who pushed the field toward non-representational art. The term 'still life' became accepted in the seventeenth century but there remained a diverse vocabulary for this type of imagery up until then including, *nature morte* in French and *vanitas* in the Netherlands, for example.

Little has changed in style or iconography in still life photography from these prototypes in painting. Nineteenth century photographic still lifes are most often tabletop arrangements of materials traditionally found in still life precursors: fruit, crockery, flowers, shells, statues and dead game. This type of image making attracted a number of photographers, notably the inventors of photography, Louis Jacques Mande Daguerre and Talbot. Other photographers, like Adolphe Braun and Jules Dubosco, also used props such as skulls to make visual connections with painting and its capacity for symbolism, which was also a High Victorian interest and widely understood.

In a letter to his short term partner Daguerre, photography pioneer Nicéphore Niépce refers to two Heliographs, only one of which has been identified. The image, known as *La table servie*, shows a set table, laid with a tablecloth for a meal with bowls, cutlery and a goblet. The date of the image has been disputed, but historians suggest it was taken somewhere between 1823 and 1829, with most dating it around 1827. Produced years before the medium had even been officially invented, Niépce's image is considered the first still life photograph.

Daguerre's first successful daguerreotype was also a still-life, taken in 1837, in a window sill. Entitled *Still life*, it shows a group of plaster casts, a framed print and a wicker wrapped bottle. Daguerre's interests reflect both the technological limitations of the earliest daguerreotypes and the nineteenth-century desire to collate and categorize, as seen in the establishment of museums and their impulse to catalogue the world around us. His famous *Shells and Fossils* of 1839, is also suggestive of this interest in classification and evokes painterly still lifes devoted to meticulously reflecting earthly existence. This tradition continues throughout the history of nineteenth-century still life photography by photographers such as Adolphe Bilordeaux, who created teeming, allegorical compositions that refer-

Bailey, Henry. Trout Roach etc.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

ence a cabinet of curiosities. Other key early examples include Hippolyte Bayard's compositions of garden implements, domestic objects and plaster casts, such as *In the Garden* of 1842 and Talbot's image of fruit published in *The Pencil of Nature*.

The best-known photographers to produce still lifes are Roger Fenton and Adolphe Braun. Both created still lifes during the genre's peak in the 1850s and 1860s. Fenton's photographs are some of the most opulent still lifes made in Britain at the time and joined a vogue for this genre already proliferating Paris (Frenchman Henri Le Secq had produced a successful series of still lifes known as *Fantasies* around 1855). Fenton's photographs, such as *Fruit*, 1860, have a great sense of texture and light, drawing on Flemish and French pictorial traditions. Photography historians Helmut and Alison Gernsheim suggested that the painter George Lance used Fenton's photographs as studies for his paintings, even though Fenton was the one accused of plagiarism at the time. Fenton's still lifes are indeed painterly in their formal qualities and reflect the highly privileged lifestyle of those to whom such exotic foods and flowers were available. His compositions regularly include either shot game or exotic fruits and sometimes mirrors and rich fabrics. His subjects are highly symbolic and explore themes such as Christian faith and the transience of earthly life.

Frenchman Adolphe Braun had worked in Paris as a textile designer, and after discovering an interest in photography, set up a large commercial studio, creating images such as *Flower study*, 1854. He later exhibited images of flowers and flower arrangements at the Exposition Universale in Paris in 1855. Braun's work was enthusiastically received and he won a gold medal for the sensuality of texture, softness of tone and the play of reflections in his images. So influential were these photographs and so great was the demand for them, that he and his many assistants produced a collection of studies intended for artists using flowers in decorative motifs. The set consisted of 300 plates of floral arrangements and natural flowers to serve as 'designs' for painters but Braun's principal market were the fabric designers employed by the local mills. In 1864, another French photographer, Charles Aubry, who also worked as a designer, formed a Paris-based company to manufacture plaster casts and photographs of plants and flowers, such as *Leaves*, 1864. Although unsuccessful in his business, he continued to sell the photographs to drawing schools throughout the 1870s.

Braun's still life images that incorporate shot game and hunting equipment, like *Still life with Deer and Wildfowl,* c. 1865, can be seen as modern versions of the work composed by the painters of Northern Europe. Scenes capturing the 'bounty of the hunt' were extremely popular with still life photographers, as they had been during the eighteenth century with painters. Photographers including Fenton, Charles Phillipe Auguste Carey, Dr. Hugh Welch Diamond, Louise Laffon, William Lake Price and Victor Albert Prout all created still lifes on this theme.

Still lifes could sometimes be treated unconventionally, as in Dresden photographer, Hermann Krone's

Still life of the Washerwoman, 1853. Krone's image does not depict a woman at all and instead uses the visual signs of her trade: washing tubs, buckets, pitchers and cloths positioned in a studio setting. Krone was celebrated for his daguerreotype still lifes of scientific instruments and equipment, amongst other subjects, and his stated ambition was 'to make photography useful to all areas of science.' Henri-Victor Régnault also created a number of still lifes with a scientific outlook. His *Laboratory Equipment, Collège de France, Paris*, c. 1852, shows a tabletop arrangement of test-tubes, measuring equipment and other devices, literally reflecting photography's bonds with science.

Similarly, Scottish photographer and writer John Thomson included images of flowers and fruit to an ethnographic end in his *Illustrations of China and its people* (1873–74). Thompson's images draw on the tradition established by European painters who recreated the bounty of the worlds outside England and America in luscious settings. Unlike some still lifes which visually describe such cornucopia as a feast for the senses, Thompson illustrated his subjects in even greater detail by including their botanical classification and descriptions of their texture and taste; intensifying the viewer's experience. He preferred the wet collodion process, a then cumbersome method, and produced large-format negatives and stereographs that are noted for their clarity of detail and richness of tone, securing their 'scientific' status.

The market for still life photography during the nineteenth century was both commercial and domestic. It was a time of art patronage by the fashion-conscious bourgeois when relations between photography and painting were as close as they would ever be and both photographers and painters aimed to service the same picture collectors. Nineteenth century still lifes are now seen in a category of photography that includes genre scenes, allegories and composite images as each attempted to speak the language of 'high art.' One of the first museums to collect photography, the South Kensington Museum (later the Victoria and Albert Museum) included still lifes by Prout and Lake Price in their first purchase of art photographs for the collection in 1857.

Nineteenth century still life photography can be understood through terms of reference drawn from painting, where everyday objects assume a particular monumentality through their meticulous description and often dramatic lighting. The imaging of objects is part of a tradition of probing the external world through its close depiction. Lavish displays of affluence and abundance can also be found at the heart of the still life tradition. It is perhaps photography's ability to radically transform everyday objects, through its peculiar temporal qualities, however, which anticipates the experimental work of the best known still life photographers of the twentieth century, namely Irving Penn and Paul Outerbridge. The tradition of still life scrutinizes everyday existence around the table where simple objects symbolise the decay and mortality associated with life. Still lifes exalt the banality of the subjects they depict through technical virtuosity and they offer a sharp reminder of the materiality of our existence.

KATE RHODES

See also: Talbot, William Henry Fox; *The Pencil of Nature;* Courbet, Gustave; Daguerre, Louis-Jacques-Mandé; Braun, Adolphe; Niépce, Joseph Nicéphore; Bayard, Hippolyte; Le Secq, Henri; Diamond, Hugh Welch; Price, William Lake; Prout, Victor Albert; and Régnault, Henri-Victor.

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STILLMAN, WILLIAM JAMES (1828–1901)

American photographer, painter, journalist

William James Stillman was born in Schenectady, New York in 1828. Despite his strong passion for an artistic career, his family sent young William to the Union College of his birthplace from where he graduated in 1848. His ambition, however, to become a notable painter, dominated his early life. He took lessons and made the acquaintance of well-known artists including William Page and Edward Ruggles. He travelled to England and France where he met J. M. W. Turner, John Ruskin and Dante Gabriel Rossetti. Stillman's career as a landscape painter did not last long despite his recognised work for which he earned the title of the 'American Pre-Raphaelite.' Soon the necessity for a more profitable occupation led him to the practice of journalism. The absence of an American periodical devoted to art prompted him to establish an art journal entitled *The Crayon: A Journal Devoted to the Graphic Arts, and the Literature Related to Them* in 1855. The journal was very successful but the long working hours that the editorial work required soon exhausted him and led to his resignation in 1861.

Stillman, William J.. Relief of Nike from the Temple of Athena Nike, Athens. Figure of Victory, fromt eh Temple of Victory-High Relief. One of 26 prints ina book entitled: "The Acropolis of Athens."
The J. Paul Getty Museum, Los Angeles

During the American Civil War, Stillman volunteered to join the Massachusetts troops. His poor health, however, was an obstacle and he was offered the position of the American Consul in Rome. Three years later, in 1865, he was transferred to Crete which at the time was excluded from the new Greek state and was still part of the Ottoman Empire. During the three years of his stay on the island, Stillman and his family (he had married Laura Mack in 1860 and had two children) experienced the Cretan Insurrection. Their personal safety was at risk, so Stillman was advised to leave Crete for Athens where a few months later his wife committed suicide. His son Russie was suffering from a fatal disease which forced Stillman to return to England where he became engaged in journalistic and literary pursuits for the rest of his life. In 1871 he married the daughter of the Greek consul in England, Marie Spartali, with whom he appeared to have lived happily until his death on the 6th of July 1901.

Stillman was introduced to the medium in 1857. As he mentions in his autobiography '[he had] bought a photographic apparatus, and learned photography as it was practised [at that time], a rude, inefficient, and cumbersome apparatus and process for fieldwork, of which few amateurs nowadays can conceive in inconvenience.' At first Stillman took up photography as 'a means to bring back records of vegetation.' Two years later he published his first photographic album entitled *Photographic Studies by W. J. Stillman, Part 1. The Forest, Adirondack Woods.* The existence of Stillman's late 1850s Italian views testify that he took up photography once again whilst appointed consul in Rome, since his official duties left him plenty of time. However, his serious involvement with the medium came when he was transferred to Crete. During his stay, Stillman photographed even the most remote parts of the island and conducted a number of experiments on the chemical development of images and photographic equipment.

The latter resulted in the construction of an apparatus that he called the 'universal camera' and which was an improvement on his 8 × 10 Kinnear camera.

Stillman's most significant contribution to the history of photography is a body of work of the antiquities of Athens. These photographs were taken in 1869 when he was forced to leave the island of Crete and advised to stay in the capital of the Greek State. The series of images taken that year resulted in the publication of an illustrated album entitled *Acropolis of Athens, Illustrated Picturesquely and Architecturally in photography* published privately by F. S. Ellis, in 1870. This large format album is bound with a red maroon leather cover and contains a total of twenty-six carbon prints. The photographs are mounted separately on individual sheets of card and most of them are numbered, signed and dated. Each image is accompanied by a descriptive text, printed on the opposite page, identifying the site of the precise geographic orientation. Copies of Stillman's Acropolis album can be found at the British Library, the J. Paul Getty Museum and the Gennadius Library of Athens.

Stillman's 1869 photographs of the Grecian antiquities are characterised by sharp detail and extreme depth of field made possible by the sharpness of the Dallmeyer lens used. They demonstrate the choice of an original viewpoint, which reveals the architectural structure of Classical temples with precision and the sculptural details with accuracy. Furthermore, Stillman's originality of visual expression is favoured by his extended knowledge of the technical aspects of photography. The excellent use of his technical skills, in the domains of choosing his photographic equipment and processing techniques, result in a unique clarity within a wide range of focus. Additionally, the realistic representation of ancient ruins reflects Stillman's influence from his artistic background and contemporary aesthetic tendencies.

As the years went by, his involvement with photography became even more diverse. He continuously experimented and improved upon photographic processes. In 1874, he published a handbook entitled *The Amateur's Photographic Guide-Book, Being a Complete Resume of the Most Useful Dry and Wet Collodion Processes* dealing with the problems of working with early processes, especially in difficult terrains and climates. Additionally, Stillman published, in various journals such as *The Nation, The Photographic Times* and *The Photographic News*, a number of articles dealing with technical issues, commenting on the use of particular lenses and giving examples of contemporary photographic works which met his criteria for good practice.

In 1876, during a visit to the United States, Stillman published another photographic album entitled *Poetic Localities of Cambridge*. The album is illustrated with heliotypes depicting the houses of Henry W. Longfellow and Olivier W. Holmes, Harvard College and Washington E.L.M.. The images are accompanied by a text written by Holmes and poems by Longfellow and Lowel. Original copies of this volume can be found at the Union College Library at Schenectady along with Stillman's personal correspondence.

Stillman never considered himself a gifted painter, nor a talented photographer. His introduction to the medium was almost an accident and there is evidence to suggest that his photographic work was a financial necessity. This aspect of his career never seemed to be of importance to him since it went almost unmentioned in his autobiography, which he compiled just before his death. His involvement, however, with photography was not restricted to simple topographical documentation. Stillman's significant contribution to the medium consisted of experiments with chemical processes, improvements to standard photographic equipment and the publication of articles in photographic journals of the period on a variety of subjects from the analysis of technical processes to the theoretical aspects of the medium.

ALIKI TSIRGIALOU

Biography

William James Stillman was born in 1828 in Schenectady, New York. A naturalist, a painter attracted to the Pre-Raphaelite circle, a diplomat and a journalist (he published numerous articles and books covering a wide range of subjects such as archaeology, photography and art criticism), he took up photography in 1857. From 1855 to 1861 he published the art journal *The Crayon: A Journal Devoted to the Graphic Arts, and the Literature Related to them.* During the American Civil War he was offered the position of American Council in Rome and three years later he was transferred to Crete. His involvement with photography was not restricted to simple topographical documentation. Stillman's significant contribution to the medium consisted of experiments with chemical processes, improvements to standard photographic equipment and the publication of articles in photographic journals of the period on a variety of subjects from the analysis of technical processes to the theoretical aspects of the medium. In 1859 Stillman published his first photographic album entitled *Photographic Studies by W. J. Stillman, Part 1. The Forest, Adirondack Woods.* However, Stillman's most significant contribution to the history of photography is the publication of an illustrated album entitled *The Acropolis of Athens, Illustrated Picturesquely and Architecturally in photography (*F. S. Ellis, 1870). Stillman died in England on the 6th of July 1901.

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STIRN, RUDOLPH AND CARL (active 1880s–1890s)

The Stirn brothers were manufacturers and retailers of cameras and photographic equipment with their best known camera being the Concealed Vest camera which was patented in the United States, Germany and Britain in 1886.

Stirn's camera was based on a design by the American R. D. Gray which he showed in December 1885 and had refined by May 1886. It was patented in July 1886. C. P. Stirn of the American firm Stirn & Lyons purchased the rights to the camera from Gray and with his brother Rudolph in Germany began manufacturing the camera and selling it in October 1886. The camera made six exposures on a round plate and was hidden behind a vest or waistcoat with the lens peeking through a buttonhole. The camera was an immediate success with 18,000 sold by December 1890. A second model was made larger to hold more exposures and that appeared in 1888. The cameras were sold under several different names.

In 1889 Rudolph Stirn made a 360-degree panoramic camera called the Wonder Panoramic camera designed by an American J. R. Connon, and patented in that year. Rudolph Stirn also patented and sold a range of other camera designs none of which saw the success of the Concealed Vest camera.

MICHAEL PRITCHARD

STODDARD, SENECA RAY (1843–1917)

American photographer, guidebook writer, and lecturer

Stoddard was born 13 May 1843, to Julia Ray Stoddard and Charles Stoddard of Wilton, New York, nine miles north of Saratoga Springs. In the late nineteenth century he was recognized as an outstanding photographer of the Adirondacks in northern New York State, and late 20th century critics have compared him to famous early photographers of the American West.

A job from 1862–1864 with the Eaton and Gilbert Car Works near Troy, New York, taught him landscape painting in decorating rail cars. From there he moved to Glens Falls, strategically located between the fashionable tourist spots of Lake George and Saratoga Springs. He learned *wet plate collodion* photography from a Glens Falls photographer, and soon began photographing the Adirondack scenery and selling *stereographs* and large mounted *albumen prints* to tourists.

Complementing his photography were his various guide books about the Adirondack region. *The Adirondacks: Illustrated* first appeared in 1874, and went through various editions until 1914. Wood engravings based on his photographs were included along with his own maps. Later editions incorporated photo engraving. His first wife. Augusta Potter Stoddard, managed the studio with the help of female relatives, while his brother-in-law Charles Oblinis accompanied Stoddard as an assistant.

Hotels and transportation companies, including the Delaware & Hudson 'Railroad and the New York & Canadian Railroad, used Stoddard's photographs for promotion. In 1878, he headed the Photographic Division of Verplanck Colvin's State Survey of the Adirondacks. Travel involved stage coach, steamboat, railroad, and sailing canoe. He hiked trails and climbed mountains to make thousands of photographs of what became the Adirondack Park in 1892. His slide lecture using oxygen-hydrogen projectors at the New York Assembly in Albany on 25 February 1892, was a lobbying effort to securing legislative backing for the park.

In *Adirondacks Illustrated,* 1874, Stoddard wrote of his own stereographs on sale at Ausable Chasm: "The kind universally acknowledged best are known as the 'Crystal,' and sold at $2.50 per dozen..." There was justification in such a claim, for the E. & H. T. Anthony & Company of New York distributed these images widely.

Stoddard generally used cameras ranging from 5 × 8 inches to 16 × 20 inches, and in the 1880s he turned to the more convenient dry plate process. He was particularly adept at arranging people within a landscape or architectural setting, and his images form a visual history of middle and upper class vacations. With some ability in drawing and painting, expert photographic technique, along with an awareness of art and literature, he revealed the natural setting with careful framing, sensitivity to light, form, and detail.

Historians, including Weston Naef and John Wilmerding, have linked Stoddard's work to the category of

Luminism. The term Luminism was coined to define landscape painting from around 1850 to 1875 or later. The characteristics apply to photography: small scale, depiction of crystalline light, often the inclusion of a small figure, a feeling of silence and the suggestion of a transcendent nature. Many of Stoddard's views of Adirondack lakes and streams fulfill such a 'definition, but it should be noted that the small aperture and long exposures required for overall sharpness tended to render water as a smooth, glassy surface.

Other Stoddard photographs do not fit the luminist category. This would be true of some of his fine architectural photographs of hotels like the Fort William Henry at Lake George or night photographs of tourists around a campfire. The night photographs required magnesium flash powder and with this dangerous substance, Stoddard proved himself a master with a noteworthy photograph of the Statue of Liberty in New York harbor. He used magnesium flash to illuminate the vast spaces of Howe Caverns near Albany, New York, and published an illustrated article, "Photographing Bats" for *The American Annual* of *Photography and Photographic Times Almanac,* 1889.

Photographs for William West Durant, developer of the "Great Camps" in the western Adirondacks provide an impressive record of those rustic estates in the wilderness. Stoddard produced an elephant folio album of silver prints showing Durant's Sagamore and Camp Pine Knot on Raquette Lake.

This Adirondack photographer turned his camera on other aspects of this region which included photographs of lumbering and of large, conical kilns for making charcoal for the tanning industry. Both industries showed little concern for the environment, and this led Stoddard to publish a short-lived periodical, *Stoddard's Northern Monthly,* (1906–1908) in which he took on the lumber interests which were denuding large swaths of forests.

While thought of primarily for his Adirondack photographs, Stoddard photographed in many other areas. In 1892, he traveled to the West Coast via Canadian railroad. He photographed indigenous people as well as scenery and continued his journey to Alaska, where he made photographs that would be used successfully as lantern slide lectures. A mammoth panoramic camera for negatives 20 × 49½ inches, especially made for this excursion, failed to function.

In 1895, he was a ship's photographer covering a Mediterranean cruise. Here, he used a roll film camera to illustrate his text for the self-published *In Mediterranean Lands: The Cruise* of *the Fries/and,* 1896. On June 26,1897, he sailed as ship's photographer for a cruise to northern countries including Russia. Surreptitious snapshots taken with his "kovered kodak"-a Kodak # 4 taking 4 x 5 inch negatives- were a departure from luminist images and glass plate photography. The resulting self-published book for the passengers on the northern European cruise appeared in 1901, as *The Midnight Sun: Being the Story* of *the Cruise* of *the Ohio.*

In the early 1900s, Stoddard experimented with new textured printing papers, cyanotype, and soft focus effects suggestive of the Photo-Secession. Most of his late activity involved writing, revising his guide book, and recycling earlier photographs. He also sold cameras and supplies to a burgeoning amateur photography market.

Stoddard's wife died in 1906, and two years later he married Emily Doty. In 1908, he purchased an qautomobile and was among the first to drive into the Adirondacks. He had early affiliations with the Methodist and Baptist denominations, was an active member of the Temperance movement, and later embraced Spiritualism. Stoddard died on May 3, 1917, in Glens Falls.

JOHN FULLER

Biography

Seneca Ray Stoddard was born 13 May 1843 in Wilton, New York. He acquired art technique as a railroad car decorator in Troy, New York, 1862–1864, and then moved to Glens Falls, New York, where he learned photographic skills from a commercial photographer. The area from Saratoga Springs, New York, northward to the Adirondack mountains was already a tourist attraction, and Stoddard's photography of landscapes and hotels were purchased as stereographs and larger mounted albumin prints. In 1874, he published *Adirondacks Illustrated,* which included his adventures in the wilderness along with his maps and descriptions of accommodations. He was a successful lecturer who showed lantern slides before the State Assembly in 1892, as a lobbying effort for creating the Adirondack Park. He photographed such distant regions as Alaska and part of Russia as well as Mediterranean countries. He published extensively. He exhibited at the Philadelphia Exposition of 1876, and received widespread acclaim .for his multiple magnesium flash photograph of the Statue of Liberty. Since a monograph on Stoddard appeared in 1972, his work has attracted renewed attention, and he is often considered the Eastern counterpart of the noted photographers of the Western United States. Stoddard died in Glens Falls, 3 May 1917.

See also: Wet Collodion Negative; Albumen Print; Dry Plate Negatives: Gelatine; and Artificial Lighting.

Selected Works

Lumbering in the Adirondacks. The Choppers, albumen print @1890, Adirondack Museum.

Avalanche Lake, Adirondacks, albumen print, @1888, Adirondack Museum.

Raquette River, At Sweeney Carry, albumen print @1888, Adirondack Museum. *Horicon Sketching Club* [Lake George], albumen print, Adirondack Museum. *Liberty Enlightening the World,* multiple magnesium flash, albumen print @1890,
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STONE, SIR JOHN BENJAMIN (1838–1914)

In the seemingly casual context of the life of a Victorian gentleman, John Benjamin Stone was a wonder and perhaps the most prolific photographic recorder of his generation. He dealt with the way things looked and has left us with a huge archive of 25,000 images. The work is simply remarkable. That Stone is not more celebrated should be a national shame for he presented England with its history, perceived from a Victorian standpoint. He also showed the world to England—he was a great traveller.. In short, Sir Benjamin was a man of means and a great character.

The means came from inheritance and his own abilities as an industrialist, the character from a sense of duty. Stone was first a member of Birmingham City Council, later a Tory member of Parliament for East Birmingham, a seat he held for 15 years.. Stone came from a well-to-do Midlands family and was knighted in 1886. In hindsight we can mark his career as one of power and service to the community, but he excelled in his passion—photography.

His interest began through collecting the works of others and later developed into his own practice as an enthusiastic taker of photographs. Stone's zeal can be judged by his output. In the City of Birmingham library sit 19,174 contact prints from his whole plate negatives, 3,045 enlargements, 14,000 negatives and 2,500 lantern slides. They were given in 1921 by the Trustees of Stone's estate. During his lifetime Stone had made a handsome gift of 1200 prints to the British Museum. and various Midland's institutions. Given his combination of wealth and industry, Stone chose three paths. The paths were crucial to his work at and away from Parliament, because he chose to picture the evident, not the incidental. His was a sense of history which he saw vanishing as Britain became increasingly industrialised He could be placed as a late taker of the spirit of William Morris and the 'Art & Craft' movement. He pictured the look of things but avoided what was obvious. One strand lay in compiling a 'National Photographic Record' which documented English customs and traditions, another was a visual account of his time in Parliament and the third was aan extended photographic journal of his travels—he was adventurous and visited North and South America, most of Europe, China, India, Ceylon (as Sri Lanka was then known), the West Indies, South Africa and Japan. And all over Britain. One can only be impressed at how prolific he was. Stone was a visual sociologist, though not in a systematic sense, and tried to gather up an individual analysis of the world. That said, he did not underestimate his worth; he amassed 38 albums of press cuttings, now in the Birmingham library, which give a good view of his abilities as a self-publicist.

The 'National Photographic Record' was originally proposed by Jerome Harrison in 1892. Stone knew Harrison through his involvement with the Warwickshire Photographic Survey; Sir Benjamin was the first President of the Birmingham Photographic Society and the Warwickshire project gave rise to grander ambitions which were nothing less than an audit of 'Life and History' made clear in pictures. It should be said, however, that he took up photography quite simply because no one else was taking pictures of the things he thought to be of value, so he was unable to buy them. Thus he learned how to make them for himself and history. It was to become a work of stature. He stored his glass plates carefully in two specially built out-houses in his back garden because of a personal conviction that the past might inform the future. Sir Benjamin planned three books to cover his work as a photographer. Two were published by Casssell, London. No date appears in the books though 1903 might be close. In typical style they were called 'Sir Benjamin Stone's Pictures." They covered his images of the enactments and ceremonies of British folklore and his documents of the people of Parliament. These two volumes were very handsomely produced. The third, on his travel pictures, was not published, which is a shame as he was an acute observe

of what made the ordinary extraordinary. It has been estimated that Stone spent £30,000 on his photographic exploits—which could be multiplied by 25 to gain a contemporary value.

PETER TURNER

STORY MASKELYNE, NEVIL (1823–1911)

British photographer, chemist, mineralogist and MP

Born on 3 September 1823, in a large Wiltshire country house, Nevil Story, as he was then called, was the eldest son of Anthony Story, a squire and barrister, and had three sisters and a brother. Nevil's mother, Margaret, was daughter of Nevil Maskelyne, an Astronomer Royal of the previous century. Nevil Story became interested in science while still at boarding school, through reading a book by Mary Somerville, which he won as a school prize, later claiming that this book had turned him into 'a man of science.' In the summer holidays of 1840, George Dolland, a family friend, visited the Storys house and showed them how to make photograms, or 'sun pictures,' which awoke Nevil's enthusiasm for photography. Besides trying out photograms, which required perhaps half an hour of exposure to sunlight, he experimented with his grandfather's camera obscura, and constructed himself a second camera from an old cigar box. He became frustrated by the erratic results of his photographic attempts, but this only increased his interest in chemical reactions and the properties of light. In 1842, Nevil went up to Wadham College, Oxford, to read mathematics, but his energies centred on attending lectures on scientific subjects such as chemistry and optics, which were outside the Oxford examination syllabus at that time. To his father's dismay, he also spent substantial sums of money on photographic equipment and chemicals, and evidently passed much time experimenting with them. When Nevil reached his twenty-first birthday, his father changed the family name to Story Maskelyne, ready for the time when Nevil would inherit the estate—a Maskelyne property.

After graduating from Oxford in April 1845, young Maskelyne set up a laboratory in a thatched farmhouse on his father's land and experimented with calotype photographic images. He was particularly concerned at his own failure to record the foliage of trees in sunlight, believing it to be due to 'extreme red,' now known as infra-red, and to their green colour, (ultra-violet radiation from leaves in sunlight was not then understood). He experimented with both chemicals and filters, until he achieved better results with tree photography. In the autumn of 1845, Maskelyne was sent to study for the Bar in London, but the law held no appeal, so he read the latest European scientific articles rather than law-books. As a result of this and of his frequenting Faraday's laboratory, he was thinking deeply about the properties of light and chemicals, and wrote a perceptive manuscript scientific paper concerning light-waves and their relationship to light and electricity. He became a member of the Committee of Visitors at the Royal Institution in London, alongside William Henry Fox Talbot, William Grove, Faraday, and Wheatstone of the electric telegraph. In 1847 he could have applied for a professorship in scientific subjects at St Andrew's University in Scotland, but his father, who felt a professorship was socially beneath the family status, forbade it.

Later the same year, Sir Benjamin Brodie, an eminent chemist, sensing Maskelyne's despair at a lost scientific opportunity, invited him to work in his private laboratory in London. This time, Maskelyne defied his father and turned to chemistry. In 1848 he was experimenting with albumen—egg-white—which had recently been introduced as a medium for attaching photographic chemicals to a glass base, and became involved with the London Christian Socialist movement, a group of young intellectuals aiming to help working men improve their lot. By 1849, Maskelyne was lecturing in mineralogy at Oxford from time to time, to help out Professor William Buckland, whose health was failing. In 1850, he was offered the post of Deputy Professor in Mineralogy, for which he prepared in London, with Faraday's help.

Back in Oxford, Maskelyne lived for the next seven years in rooms in the basement of what was the old Ashmolean Museum in Broad Street. During those years he taught analytical chemistry in his basement laboratory, which was innovative in that chemistry was normally taught as a theoretical, rather than a practical, subject. At this time, Maskelyne was experimenting with mica as a stable base for photographic negatives, and was taking interesting and lively portraits of his own Oxford circle, using chemicals to achieve better contrast than usual for the time. He was successfully using collodion on glass soon after the process was invented and lived a sociable life, entertaining young like-minded Oxford friends in his basement. They were almost all involved in the struggle to improve the status and recognition of science at Oxford. In 1857 Maskelyne met Thereza Llewelyn, herself a keen amateur photographer, whose parents were both photographic enthusiasts, and the couple soon became engaged. While staying with her family in South Wales, whose wealth derived from coal mines and land-ownership, he was invited to a house-party at Charlton Park, Malmesbury, where he took some fine photographic studies of the fashionable assembled company.

Marriage necessitated leaving Oxford for better-paid employment, and he found himself back in London, this time as Keeper of Minerals at the British Museum. Maskelyne tried to establish a small chemical and pho-

tographic laboratory in the museum basement, but fire regulations prevented its use. His career as Keeper of Minerals was successful and lasted for twenty years, during which time he retained his professorship at Oxford, but his photographic contribution was finished now that chemical experiments were impossible. In the British Museum years, Maskelyne wrote numerous scientific papers and counted great numbers of contemporary scientists among his friends. When at last it was time for him to leave the museum in 1879, the year his father died, he returned to Wiltshire to manage the family estate. He became Member of Parliament for Cricklade in Gladstone's Liberal government, and helped to prepare bills on technological matters like electric lighting or the ventilation of London's underground railways. Even though Nevil Story Maskelyne was not among the great artistic photographers of the nineteenth century, he created some interesting and sometimes lively images. His enthusiasm and scientific ability are the attributes which earn him his place in the history of the earliest era of photography.

VANDA MORTON

Biography

Nevil Story Maskelyne was born on 3 September, 1823, at Basset Down in the parish of Lydiard Tregoz, North Wiltshire. An enthusiast for photography and chemistry from his teenage years, he experimented first with photograms and then with calotype negatives and prints. While a student at Worcester College, Oxford, he exploited chemical elements to produce sharper images and to record the growing foliage of trees in sunlight. He experimented with mica as a stable base for negatives, and was an early user of the albumen and collodion processes on glass. He was deeply interested in the properties of light and chemicals, and published numerous scientific papers. Maskelyne later became Professor of Mineralogy at Oxford, Keeper of Minerals at the British Museum and Member of Parliament in Gladstone's government.

See also: Faraday, Michael; Talbot, William Henry Fox; and Wheatstone, Charles.

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STUART-WORTLEY, COLONEL HENRY (1832–1890)

Archibald Henry Plantagenent Stuart-Wortley was born 26 July 1832 at Wortley, Yorkshire. His father Charles James Stuart-Wortley died in 1844. His mother Lady Emmeline née Manners, was a poet and travel writer and his sister Victoria, as Lady Welby, became a pioneer in the field of semantics. Henry joined the army in 1848 as a lieutenant and served as a Captain during the Kaffir Wars 1850–53 in Africa and in the Crimea in1854–55 Deputy-Assistant Quarter Master as a Brevet-Major. It was while in Africa in1853 that Stuart-Wortley took up photography and later observed Roger Fenton in action in the Crimea in 1855. After his mother died while travelling to Beirut in October 1855 Stuart-Wortley escorted his sister back to England where he remained on half-pay during 1856, briefly pursued a career in politics in 1858–59 and retired by sale of his commission in February1862 being granted the honorary rank of Lieutenant-Colonel.

Photography became a vocation for Stuart-Wortley by 1860 and he sought advice from photographic innovators, particularly in the new 'dry 'collodion processes, including Thomas Sutton and George Wharton Simpson, respectively editors of *Photographic Notes* and *Photographic News* who looked to the leisured amateurs to advance photography. Of particular interest in these years was the search for a means to capture motion in photographs, i.e. with exposures under about a second and the development of various "dry" processes to preserve the sensitivity of wet-plates for use outdoors and over the decade the development of dry- collodion plates and developers.

Stuart-Wortley took a trip to India in 1860 where he practiced his craft but it was on his Mediterranean travels in 1861 that he began to apply methods of his own for securing the desired "instantaneous" photography. He must have been familiar with the work of pioneer marine photographer of the 1850s John Dillwyn Lewellyn and the secret of Gustave Le Gray's dramatic "moonlit" effects achieved by photographing directly into a cloud-covered sun at mid-afternoon. Stuart-Wortley however, used a fast wide aperture and learned to whip his cap over his Dallmeyer triplet achromatic lens in under a second. He used a version of a dry collodion process in the field, a light-tight carrying box of his own design, fixed the negatives at night and then intensified the thin plates on his return. On his return to England his atmospheric Italian pictures showing the belching Mt Vesuvius, waves and rich cloud effects gained him membership in 1862 of the Photographic Society of London and an honourable mention as at the Society's International Salon. As referenced from "9th Annual Exhibition of the Photographic Society London," *British Journal of Photography,* January 15 1863 p.31, his

cloud studies were described as "gems" of the 1863 salon and these and his portraits up to10 × 12 inches were noted for their size.

By 1863 Stuart-Wortley was on the Council [of the Photographic Society] and later served as Vice President at various periods over the next twenty years. From 1863 he exhibited regularly at the Photographic Society of London and received medals there, at the Royal Polytechnic Society of Cornwall, and the Manchester Photographic Society as well as at the Société française de photographie in Paris where his "A Wave Rolling in" was praised. He also began lecturing and contributing papers to the *Photographic News* and the *Photographic Journal* of the Photographic Society of London where his long article "On Photography in Connection with Art" appeared in October 1863. In it he describes how the beauty of a sunset serves as a respite from the vexations of life and an inspiration. He thus recommended amateurs get "life" in their pictures with some form of rapid process and told of his own success with adding bromide to collodion and liberal nitric acid in the bath. This was Stuart-Wortley's only manifesto; his succeeding articles were mostly concerned with plate sensitivity. His quest to capture the ephemeral beauty of seascapes was not mere rising to a technical challenge but embodied deeply felt belief that spiritual comfort and values could be expressed in photographs of fleeting natural phenomena.

In 1864 Stuart-Wortley settled in Rosslyn House, St John's Wood, London where he built a studio, and in 1865 married Augusta Vershoyle—the couple divorced in 1878. He also turned professional in 1864 forming the United Association of Photographers, an ambitious multifaceted commercial franchise company; His brother-in-law Sir William Welby, was a shareholder and Director. The Association aimed to specialize in upper class and royal portraiture and over the next few years registered 82 portraits in the Copyright Office. They promoted new products in various formats—chiefly the German Jacob Wothly's 1864 uranium and silver process; an early but ultimately unsuccessful form of collodio-chloride printing-out paper—and released art reproductions in the new carbon process. The venture and was not as successful as hoped and in 1866 Stuart-Wortley took on a position as Secretary to his uncle, Lord John Manners, at the Department of Works. The United Association of Photographers company was liquidated in1867.

Through the late 1860s Stuart-Wortley continued exhibiting and publishing unusually large portraits and art reproductions in carbon including a series old master drawings in the collection of his relative the Duke of Rutland at Belvoir Castle In 1869 James Sheldon Wholesale Publishers of London released a series of card mounted albumen prints "Photographed from Nature by Colonel Stuart-Wortley." His "moonlit" seascapes also developed new scale and drama in the late 1860s and came with poetic titles.

In 1872 Stuart-Wortley again tried business when he founded the Uranium Dry Plate Co. to market his own urano-bromide dry-plate negatives. Despite energetic promotion, further demonstration in 1873 that a strong alkaline developer considerably increased the sensitivity of his plates and endorsement of the plates by Captain William Abney, the business was sold in 1875. A year before the Lord Chancellor appointed Stuart-Wortley as Head of the Patents Museum at South Kensington. This position evolved into that of Keeper of Machinery and Inventions, which he held until retirement in 1889.

Wortley turned his enthusiasm in the late 1870s to further the cause of carbon printing and then later gelatine dry-plate processes. He exhibited widely, winning a medal for large figure studies in 1875 at the Royal Cornwall Polytechnic and medals at Philadelphia Centennial in 1876 for large portraits and his new almost abstract large seascapes. He returned as a Vice President at the Photographic Society from 1875–1888 and served as a Trustee of Photographer's Benevolent Society formed in 1874 with Lord Hawarden, whose late wife the amateur photographer Clementina Hawarden, had also won medals for "instantaneous" prints at the Photographic Society of London exhibition in 1863. In 1879 he discovered that gelatine emulsions kept at a high temperature could be made sensitive over a few hours rather than days.

Stuart-Wortley travelled during and after his military service to Africa, Turkey, Ceylon, India, Greece, Turkey, Europe and the Mediterranean. In 1880 he undertook a world tour with his new wife Lavinia, neé Gibbons. The couple travelled via Australia and New Zealand to Tahiti and on to New York. He carried his own gelatine dry-plates especially modified to withstand the heat of the tropics and a mechanical shutter of his own invention to cater for the shorter exposures needed for the bright light of the Pacific. In 1882 he published a book illustrated with collotypes titled *Tahiti: a series of photographs taken by Colonel Wortley with letterpress by Lady Anne Brassey*. In addition to his photography Stuart-Wortley was an expert in marine fauna and maintained a large collection of British specimens in aquaria. He called on ethnographic collector William Macleay in Sydney in February 1880 and a photograph of the latter's collection of native artefacts appears in the Tahiti book ascribed to that of Mr Flockton.

Stuart-Wortley continued to exhibit until the mid-1880s and resigned from his position at the South Kensington Museum in 1889 due to ill health. He died 30 April1890 in London. In 1898 a group of fifty prints were exhibited for sale at the International Exhibition of the Royal Photographic Society. The fate of the bulk

of his personal archive is not known; the Huntington Library and Art Gallery, California holds 27 seascapes that were found within Lady Annie Brassey's travel albums and were acquired in 1923, and the J.Paul Getty Museum holds 35 seascapes—31 of which were collected by Sam Wagstaff in the late 1970s.

GAEL NEWTON

Biography

Archibald Henry Plantagenet Stuart-Wortley was born on 26 July 1832 in Wortley, Yorkshire. He first took up photography in Africa in 1853 while in the army and began exhibiting portraits and dramatic 'instantaneous' seascapes in 1862 the same year he was elected as a member Photographic Society of London later serving on the council and as Vice-President on and off until 1884. He contributed papers to the *Photographic News* and *The Photographic Journal*. In 1864 Stuart-Wortley formed the United Photographers Association, a commercial franchise liquidated in 1867and from 1871–74 marketed his own plates through his Uranium Dry Plate Company. He is recognised as the author of one of a number of "dry" collodion processes in the 1860s and 70s. Simultaneously with his photographic work, he held several paid positions. He died in London 30 April 1890. Stuart-Wortley is best known aesthetically for his large "moonlit" seascapes with poetic titles. A series of his nature studies published by James Sheldon, London in 1869 and proved popular with artists. His 1882 book *Tahiti: A Series of Photographs…with letterpress by Lady Brassey* was illustrated with collotypes from images made in 1880.

See also: Sutton, Thomas; Dry Plate Negatives: Non-Gelatine, Including Dry Collodion; *Photographic Notes (1856–1867)* and *Photographic News (1858–1908);* Dallmeyer, John Henry & Thomas Ross; Le Gray, Gustave; Abney, William de Wiveleslie; and Hawarden, Viscountess Clementina Elphinstone.

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STUDIO DESIGN AND CONSTRUCTION (1840–1900)

George Cruikshank's 1842 cartoon showing Richard Beard making a daguerreotype at the Royal Polytechnic Institution in London is believed to be the earliest illustration of a photographic studio. The cartoon was created as an illustration to accompany S. L. Blanchard's poem "The New School of Portrait-painting." In that woodcut we see a surprisingly sophisticated studio design, considering that portrait photography had only recently been introduced, and that Beard's studio was the world's first.

Daylight was the exposing light source, supplied through a glass ceiling. A system of calico blinds could be drawn or opened to control the direction and intensity of the light. The subject sat on a raised dais, with a moveable screen overhead—to reduce glare on the top of the head. The dais could be moved at will around the circular walls of the studio, to ensure that the subject was lit as well as prevailing daylight conditions permitted.

Cameras were fixed on a platform suspended from rails around the walls of the studio, ensuring that the camera to subject distance remained fixed, eliminating the need for the camera to be focussed before each exposure. In the Cruikshank cartoon, two cameras—presumably offering two different plate sizes—can be seen on the platform while the photographer, standing on a set of steps, times the exposure.

With exposures running into minutes on dull days, and still very long even in the brightest of light, the subject was held in place with a head clamp.

Top lighting on its own was found to result in deep shadowed eyes unless reflectors were used to direct more light directly into the subject's face. A more satisfactory answer was a studio where side lighting light could also be introduced—the top floor of a building with large windows as well as skylights being one of the options. The alternative was a large greenhouse-like glasshouse structure, fitted with screens and blinds.

That basic idea of a glasshouse studio where light could be controlled by blinds remained the guiding principle of studio design for several years. In today's studio, the photographer starts off in a black room with

no light, and introduces light where required. The early practice of starting off with diffuse even lighting and removing light where it was not needed arguably yielded a much more natural effect.

It had its drawbacks, however. The more the photographers used baffles and shutters to create special visual effects, the longer the exposure times became. Julia Margaret Cameron**'s** sitters frequently complained about exposures running into several minutes as the great portraitist sought to create dramatic effect.

Many early studios were built on the roofs of tall buildings, ensuring even and consistent lighting. According to a newspaper report in the *Glasgow Herald* in 1843, the location of the studio was to ensure that 'the light of day which acts to him [the photographer] the part of a pencil, may have free and uninterrupted access.' But, of course, in cities, that high position surrounded by chimneys brought with it soot and smog from coal-burning fires.

Before the end of the 1840s, converting the upper floor of a building to give good window space—facing north if possible—and a large skylight, offered the ideal combination of top and side or front light. Those walls not replaced with glass were painted white or light blue, to ensure the highest actinic value of the reflected light.

In 1849, Henry Hunt Snelling writing in his book *The History and Practice of the Art of Photography* (New York: G. P. Putnam) noted

> In choosing your operating room, obtain one with a northwestern aspect, if possible; and either with, or capable of having attached, a large sky-light. Good pictures may be taken without the sky-light, but not the most pleasing or effective.

That advice was echoed in manuals throughout the 1850s. Keeping the glass clean, however, posed a considerable challenge. Dirty glass, polluted by smoke not only increased exposure times by acting as a filter, but also radically altered the actinic value of the light. The blue content of the daylight to which the daguerreotype and wet collodion processes were sensitive was considerably reduced by having to penetrate the yellow tar stain which smoke and rain overlaid on to the roof glass. Writing in his 1868 *Manual of Photographic Manipulation,* William Lake Price observed that

> Thus the light cast on the sitter traverses a villanous compound of concentrated coal smoke and the victim, impaled on the head rest, is made to suffer double the requisite amount of "exposure."

To alleviate this suffering, he outlined an ingenious and semi-automatic system of pipes and pumps for washing and cleaning the skylight. An added bonus of this system, he noted, was the cooling effect on the studio itself by the periodic flushing of the roof with cold water during hot days.

The head clamp remained a part of studio portraiture into the 1870s, with a wide variety of devices being invented and marketed. Some were free-standing on heavy cast-iron bases, whilst others were built into chairs. All were designed to reduce the instances of a portrait being ruined by the subject inadvertently moving his or her head during exposure.

The idea of painted studio backgrounds was first mentioned in Antoine Claudet**'s** 1841 British patent No. 9193 'Daguerreotypes' although there is no evidence that his rights to such an 'invention' were ever upheld in any court of law. In his patent he stated that

> When the daguerreotype process was originally applied to portrait taking it was necessary to place behind the sitter some plain background or neutral tints in order that the outlines of the figures should be delineated and brought out. I have now improved this by applying behind the sitter some backgrounds of painted scenery representing landscapes, interiors of apartments, and other representations adapted to the taste and habits of the sitter or to his profession.

The studio portrait was further embellished by the balustrades, potted plants and other ephemera which continued to be used throughout the *carte-de-visite* and cabinet portrait eras. The earliest known daguerreotype of a photographer at work (in the collection of the National Museum of Photography Film and Television, Bradford, UK)—showing Jabez Hogg making a daguerreotype portrait of William Johnson in 1843—depicts a curtained window-frame with trees beyond, ornate trellis work, a classical sculpture, stools and chairs, and a caged bird above the camera (watch the birdie).

With pitched glass roofs, the photographic studio was much prone to leakage, and manuals and journals offered wide ranging advice on how to render the 'operating room' watertight. Ingenious seals were suggested—the most elaborate being the 'Philadelphia Sash' which, it was claimed, guaranteed that any leakage would be carried away by internal drainage ducts. The dual problems of waterproofing, and of minimising the impact of framing bars which might cast soft uneven shadows, brought suggestions that the thick plate glass be cut in such a way that each sheet slotted into a groove on the next.

As photographers became more concerned with the creative exploitation of light, a number of major figures started to break away from the tradition of using north light. Significant amongst these were O. J Rejlander, and Valentine Blanchard whose south-facing studio in London's Camden Town (1866) used a series of movable opaque screens to diffuse and reflect the lighting. This approach permitted much greater variety of contrast

and direction, permitting the photographer more control over visual effect.

As late as 1911, in the *Encyclopaedia of Photography* (Bernard Jones, Editor), and despite the fact that various forms of artificial light had been readily available for more than two decades, the daylight studio is still given prominence.

The daylight studio, while allowing photographers considerable control over lighting effects, limited the hours they could work. On dull winter days, low light levels resulted in over-long exposures. Several portrait photographers in the 1860s and 1870s advertised their studio opening times as 'weather permitting.'

With the widespread availability of gelatin dry plates from about 1880, with their considerably increased sensitivity, exposure times in daylight studios were reduced to only a few seconds, allowing photographers to refine the lighting techniques they had used for three decades without unnecessarily inconveniencing their sitters.

Thus the introduction of artificial lighting in the 1850s was, at first, not widely taken up by portraitists. For those who did embrace the new technology, it considerably extended working hours. John Moule's patented 'Photogen' light source—burning a powdery mixture of antimony, sulphur and potassium nitrate—was advertised in 1857 as a "rival to the sun," but was not adopted by many portraitists. Perhaps the noxious smoke it generated had a significant impact on its popularity.

Credited with the first successful use of flash was Manchester photographer Alfred Brothers in May 1864, although initially on location rather than in the studio. By the end of that year, however, he was using magnesium ribbon to create a sustained high-intensity light for studio portraiture.

Amongst those to embrace the possibilities of artificial lighting were itinerant photographers, who took their caravan studios to villages, towns and fairgrounds throughout the country.

A writer for the journal *Photographic News* (Vol. 30, no.1434, February 26 1886), described such a photographer's caravan. Attracted by a notice offering photographic portraits in five minutes by electric light, the writer entered the caravan just before the studio's closing time of 11pm remarking that "The desire to witness this astonishing advance in photographic science could not be resisted."

> So I ascended the wooden steps to the caravan…The studio was certainly no more than five feet by three. It was painted a light blue, and in the left-hand corner, fronting the sitter, was a sort of glass cupboard placed diagonally. The glass was blue, and its use I was presently to see. The studio was wholly devoid of "properties; its solitary article of furniture was a common Windsor chair, behind which was a well-worn head-rest…The head-rest was applied in half-a-second, and in a second more the artist had his head beneath the focussing cloth, and a camera with four lenses was protruded towards my face…… ……he was profoundly indifferent as to my expression…All he said was: "Now don't be afraid, it won't hurt you," and up blazed an intense light in the blue-glass cupboard. I must confess that the sensation of the blinding blaze was not pleasant. The exposure was probably five or six seconds.

The lighting was generated by a device known as the Luxorgraph, patented in Britain in 1878 by Alder and Clark, and described in E. J Wall's 1897 *Dictionary of Photography* (London: Hazell, Watson and Viney) as 'A large lantern-like device with tissue paper front in which pyrotechnic or other compounds can be burned to give artificial light for portraiture.'

The photographer stressed that this was not a magnesium wire or ribbon light source (which was covered by patents), but "Luxorygraph powder." As to the exact composition of the powder, he did not elaborate. The combustible powder was flared by a gas jet which was in turn ignited by an electric spark. The device produced a very flat lighting effect especially when used in such confined spaces.

Credited with being the first studio in the United Kingdom to offer portraits by electric light was that of Henry Van der Weyde, an American photographer who had opened premises in London's Regent Street as early as 1877. To power what he advertised as "The Van der Weyde Light" he generated his own electricity using a gas engine—another first. It was not until the late 1880s, that portraiture studios generally started to embrace the new lighting technology, and several changed their names to incorporate 'Electric' or 'Electric studio' into their names. Thus, for example, Thomas Charles Turner, who had been in business since c.1875, started to advertise his "electric and daylight" studios in 1891, and celebrated that fact on the backs of his cartes-de-visite. Electric lighting came in a variety of forms—gas lamps as well as acetylene and arc lamps.

Once artificial light became commonplace, photographers were able move their studios from the top floors of buildings to ground floor locations, offering easier access to their customers. Many, however, used electric light to augment or partly replace daylight, simply extending their ability to work independently of weather conditions. Many daylight studios continued in use well into the twentieth century.

John Hannavy

See also: Cameron, Julia Margaret; Snelling, Henry Hunt; Daguerreotype; Wet Collodion Negative; Wet Collodion Positive Processes; Price, William Lake;

Claudet, Antoine-François-Jean; Carte-de-Visite; Cabinet Cards; and *Photographic News (1858–1908).*

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STURMEY, JOHN JAMES HENRY (1857–1930)

Henry Sturmey, born in the Somerset village of Norton-sub-Hamden February 28, 1857, started a career in the burgeoning late Victorian leisure industry through a passion for cycling. An early promoter of the Bicycle Touring Club (later Cyclists' Touring Club), Sturmey teamed up with the publisher William Iliffe to edit the "Cyclist," after his compilation of the "Indispensable Bicyclist's Handbook in 1877. In the early 1880s, Sturmey moved into photography, joining forces with the journalist Walter Welford to produce *Photography* (1888), later absorbed into *Amateur Photographer* (founded 1884).

Sturmey's collaboration with Welford led to the publication of their two major encyclopaedias, *The Photographer's Indispensable Handbook* (1887), on photographic apparatus, and the *Indispensable Handbook to the Optical Lantern* (1888). Sturmey also edited the *Photographic Reference Book* (1897; 2nd ed. 1904), as well as the first volumes in the series *Photography Annual*, from 1891.

By the mid 1890s, however, Sturmey's main area of interest had passed to the automobile. He founded and edited Autocar (1895), and invested heavily in the Great Horseless Carriage Company; in 1900 he became one of the early victims of an automobile accident. Sturmey's later career is entirely linked to the car industry, founding Sturmey Motors and launching the Lotis car range, which went into liquidation in 1911.

In later life, Sturmey concentrated on the design and patent of a five—hub cycle gear, but this never reached the manufacturing stage. He became something of a recluse in his final years, dying in Coventry January 8 1930.

David Webb

SUN ARTISTS JOURNAL

The *Sun Artists Journal* is a significant example of photogravure in the history of the photographically illustrated book. *Sun Artists* was published in eight parts by Keegan Paul, Trench and Trübner, London between October 1889 and July 1891. Each Issue was devoted to the work of a single British photographer, illustrated by four hand-pulled photogravures, together with an introductory descriptive essay. Laurence Housman was commissioned to provide the cover design for the series, the letterpress being by the Chiswick Press.

Particular care was taken by the publisher of *Sun Artists* to identify the individuals who prepared the gravures for publication, all leading exponents of photogravure at the time. Mr Dawson of the Typographic Etching Company, himself an acclaimed photographer, made the etchings for Issue 1. Mr Cameron Swan of Messrs Annan and Swan made those for Issues 2, 3, and 4 while the etchings for Issues 5–8 were made by Mr W.L. Coll.

Issue number 1 featured the work of Colonel Joseph Gale (d. 1906) (essay by George Davison): *Sleepy Hollow, A foggy day on the Thames, Brixham trawlers, Homewards from the plough.*

Issue 2, Henry Peach Robinson (1830–1901) (essay by Andrew Pringle): *Carolling*

A merry tale, Dawn and Sunset, When the day's work is done.

Issue 3, James Booker Blakemore Wellington (1858–1939) (essay by Graham Balfour): *Eventide, A tidal river, East Coast, The broken saucer, A study of sheep.*

Issue 4, Lyddell Sawyer (1856–1900) (essay by Rev. F.C. Lambert): *Waiting for the boats, The castle garth, In the twilight, The boat builders.*

Issue 5, Julia Margaret Cameron (1815–1879) (essay by P.H. Emerson): *The kiss of peace, Sir John Herschel, Lord Tennyson, The day dream.*

Issue 6, Benjamin Gay Wilkinson (1857–1927) (essay by Rev. F.C.Lambert):

Sand dunes, Prawning, A pastoral, A windy corner.

Issue 7, Mrs F.W.H. Meyers (1856—1937) (essay by John Addington Symonds):

Robert Browning, Right Honourable W.E. Gladstone, M.P., Rebekah at the well, The summer garden. Myers, née Eveleen Tennant, was a highly regarded portrait photographer.

Issue 8, Frank Meadow Sutcliffe (1853–1941) (essay by Charles N. Armfield):

Water rats, Dinner time, Excitement, Sunshine and shower. The six man editorial board for *Sun Artists*, headed by W. Arthur Boord, announced in the introduction to the first issue that they sought to "emphasize the artistic claims of photography by reproducing the best work of the best photographers in the best possible manner"

and noted that previous efforts in this direction "have almost invariably had a basis personal to the artist reproduced." The board made clear that the members were themselves amateurs,"corporately unassociated with any particular phase of photographic endeavour" and expressed the hope that the whole series would form a true representation of modern photographic photography. They provided no indication that the series would be restricted to British photographers nor any criteria for the selection of artists or of individual images.

They were, however, were at pains to state that they would provide no prediction on the nature or extent of future issues, especially the single artist single issue format. Perhaps more importantly in view of their objective, they gave a clear undertaking that all hand work on the plates "would be scrupulously avoided."

Significant changes occurred during the life of the series. Issue 7 was advertised as featuring the work of J. E. Austin but he was replaced, without comment, by Mrs Meyers. Similarly Mr Seymour Conway was advertised for Issue 8 but replaced by Frank Sutcliffe, again without comment.

The editorial board closed the series at Issue 8. Responding to criticism that younger photographers had not been represented, they stated that the series was "a monument to great British photographers who had brought honour to the Art.," a significant change in direction and emphasis from their originally stated aim. One can infer that the series was initially a commercial success with the first Issue going to reprint and the publishers offering a premium on behalf of a subscriber for an undamaged copy of that issue. Similarly, the published excerpts of reviews might indicate some critical success both for the series and the original concept. Using either the citerion of "best photographer" or that of "great British photographers," it is difficult to understand the selection of some of the artists represented and the omission of others. While Emerson was a noted author on the aesthetics and practice of photography, the omission of his photographic work is highlighted by his appearance as critic for the Cameron images. Similarly the inclusion of Meyers appears to say more about the social context of the editorial board than its commitment to the best in photography. While John Addington Symonds is laudatory in his comments on Meyers portraiture, other critics found the figure "amateurish" and as Fletcher noted in the *RPS Journal*, December 2004, "the art does not hide the art." On the other hand it must be noted that Symonds essay represents one of the first attempts to address photography in critical language with a vocabulary other than that of painting or drawing. *Sun Artists* appeared at a critical time in the history of photography. George Davison (1854—1930), the author of the essay in Issue 1 was to launch the Pictorialist movement with the exhibition of his image *The Onion Field* at the annual exhibition of the Royal Photographic Society in 1890. Davison later became one of the founding members of The Brotherhood of the Linked Ring. During this time Peter Emerson recanted his original view that photography should seek to reflect human vision, stating in 1890 that photography lacked the capability to render a natural subject accurately. It is more likely that the fundamental change that was occurring in photography at that time, already represented by Davison's *Onion Field* and anticipated by Sawyer's *The Castle Garth* had rendered both the style and substance of *Sun Artists* no longer representative of the cutting edge of contemporary art photography. At a different level, *Sun Artists,* appears to be the first attempt to showcase the work of individual artists using the best available technologies to faithfully represent the work to a wider audience. As such it might be seen to anticipate Alfred Steiglitz' *Camera Work.* Photogravure represented the fourth and most significant development in nineteenth century efforts to develop an efficient method of faithfully reproducing the photographic image on the printed page in continuous tone. Karl V. Klič, a Czechoslovakian residing in Vienna, utilised the Swan/Poitevin gelatinised carbon tissue technique to produce an intermediate image on a copper plate coated with an asphalt resin. Following exposure, the plate was etched in acids of varying strengths to capture the tonal range of the original. The plate was then inked, wiped and then printed. The resultant print was a faithful copy of the original image with the fine particles of ink providing a grainless, continuous image. Klič subsequently licensed the Thomas and Craig Annan of Glasgow to use his process in England and Scotland.

While dust grain photogravure had replaced collotype as the preferred method of reproducing photographic images on the printed page, it was replaced in the early 1890's by a further Klič development, half-tone. By 1890 the introduction of the halftone process had made photogravure virtually redundant for all but the highest quality reproductions of photography. Peter Henry Emerson's *Wild life on a tidal water*, (1890) used the new half-tone process for the reproduction of his images, although his later *Marsh leaves* (1895) is regarded as the finest example of photogravure in a printed book. Perhaps the best and final examples of dust grain photogravure for the reproduction of the work of the artist photographer are found in Alfred Steiglitz' *Camera Work* (1903 –1917).

A facsimile edition of *Sun Artists* was published by Arno Press, NY, in 1973.

ROBERT DEANE

See also: Klič, Karel Vaclav; Annan, James Craig; Annan, Thomas; and Emerson, Peter Henry.

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SURVEY PHOTOGRAPHY

As a means of gathering visual evidence of the world, photography became useful in the 19th century to a number of activities associated with the idea of the survey. To survey generally means to ascertain and delineate the physical scope and specific characteristics of an entity or related entities, usually places or areas relative to their position on the earth's surface and often including people and objects. Though the activity of surveying can be traced back to antiquity, its significance with respect to developments in the modern world including the adoption of photography in its practice can be understood in light of scientific inquiry and exploration and the formation of national identities in the previous century; the geographical and geological survey and civil engineering were both practical outgrowths of eighteenth-century scientific advancement and political ideology. Surveying as a form of engineering and geographical demarcation emerged in order to articulate boundaries, topographical contours, and to establish zones of operation and the structures necessary for resource development, transportation, and commerce. It would then seem reasonable for photography to have joined preexisting representational and symbolic strategies ideal for conceiving geographical space: drawing and map and model-making procedures.

By the middle of the eighteenth century Britain and France had become absorbed with the lands and major features within their own borders, including distinctive monuments that were thought significant in the construction of a national patrimony. The Ordnance Survey of Great Britain began in 1747 as a military defensive measure to map the borders of England, but soon became an official government department to map the entirety of the United Kingdom. In the same year, France started a school in Paris for specialized training in public engineering projects, the *École des Ponts et Chaussées* (School of Bridges and Roads). That photography had come of age in this enterprise is witnessed by its having become part of the training of engineers in both of these rival countries almost concurrently: in 1856 at the school for Royal Engineers at Chatham, England, and the following year at the École. This civilian effort thus served to give momentum to the systematic use of photographs as a form of documentation of expanding industrial infrastructures and resource development in Europe and regions subject to colonialist expansion. Further, as national institutions took on more responsibility for the improvement of urban conditions, pictures of older streets or areas in decline became central to the demonstration that governments were attending to social need through new construction and civil engineering projects.

In France, sentiments toward educating the public in the past glories of its medieval history had been signaled early in the nineteenth century. *Voyage pittoresques et romantiques dans l'ancienne France* (1820–1878), a multi-volume work illustrated with lithographic plates, set a precedent for a growing "preservationist" movement that fed the collective imagination of the people. The *Mission Héliographique* was commissioned in 1851 by the Commission des Monuments Historiques, a group of authorities on the culture of France, to survey the country's architectural heritage with the camera. Photographic documentation for the purposes of preservation and restoration of selected monuments was the main thrust of the program, but the effort was not systematic nor did it appear to have the full authority of government behind it. Several of the photographers who were affiliated with the Mission Héliographique,

Watkins, Carleton E.. Cape Horn near Celilo. *The Metropolitan Museum of Art, Gilman Collection, Purchase, The Horace W. Goldsmith Foundation Gift, 2005 (2005.100.109) Image © The Metropolitan Museum of Art.*

including Gustave Le Gray and Henri Le Seq, had been formally trained in the studio of the painter Paul Delaroche; many of the several hundred images produced for the mission were thus endowed with a pictorial artistry and a marked skill with the variant paper processes of the period. Though the photographs were not utilized in any official capacity, this tentative embrace of the medium was soon to change. From the late 1850s to the end of the century the engineering school had amassed an enormous collection of pictures of public works, railways, bridges, and other constructions taken within France as well as other countries. Some of the photographers who had been affiliated with the earlier *Mission* and contributed to this and other archives, including Édouard Baldus, who produced views in the early 1860s of railway bridges for civil engineers who had worked on these projects. Charles Marville, who had also engaged in earlier documentary projects published by Louis Désiré Blanquart-Evrard's printing establishment *Imprimerie Photographique*, was commissioned by Georges Haussmann's *Travaux historiques* in 1865 to photograph the city streets while undergoing modernization under the latter's supervision.

As the major industrial powers extended their reach into other parts of the world, photography was employed to extract visual evidence from lands of scientific, archeological, architectural, and ethnological significance, economic promise, and political importance to probing western nations. In this respect, the medium was found useful by officers in the British army and the Government Civil Service. India especially was the site of an emergent economy of British intelligence and imperialism in which the camera was adopted readily enough for specific activities that may fall under the broad rubric of surveying: of reconnaissance, surveillance, and exploration of places and their inhabitants. One Philip Henry Egerton, for instance, was Deputy Commissioner of Kangra in the western Himalaya when he made a photographic excursion through the rugged mountain environment near the Tibetan border in 1863. His *Journal of a Tour through Spiti, to the Frontier of Chinese Thibet*, illustrated with thirty-six of his views of particular ethnographic and geological interest, was published by Cundall, Downes and Company the following year. Egerton's intentions to stimulate further exploration and encourage trade in the region were clear. British enterprise "would bring manufactures into the heart of Central Asia, extending civilisation to the barbarous hordes which people those vast tracks, and enriching the manufactures, exporters, and carriers of European produce, as well as Tartar Shepherds." (Egerton, 1864, pp. iv–v) More systematic efforts were to come almost immediately thereafter, with increased use of the camera for surveying the antiquities of the subcontinent in conjunction with the establishment of the Archaeological Survey of India. Photographs by various military and civilian operators would also be selectively acquired by professional and government agencies. Such collections as formed in the 19th century at the South Kensington Museum (which became the

Victoria and Albert Museum), the India Office Library and Records (acquired by the British Library), and the Royal Geographical Society (acquired by Cambridge University), testify to the robust application of the medium to the knowledge base of empire.

Having already achieved recognition for his explorations in charting the little known recesses of Africa, David Livingstone's Zambezi Expedition of 1858–64 sought to incorporate photography into the quest for knowledge of the principal features and natural resources of the eastern and central regions of the continent. The expedition was launched by Sir Roderick Murchison, geologist and President of the Royal Geographical Society, who aside from scientific interests also aimed to encourage agriculture and commercial activity among the inhabitants, thus remaining true to the colonialist project. The navigation of the Zambezi River was essential to the enterprise, and was consequently photographed in an effort to record the terrain along the water body. The expedition's botanist Dr John Kirk realized some success with the camera; his work provided images of the land that were useful in the study of disease and plant life. Such wilderness views could seem neutral enough on the surface as empirical data for scientific argument, yet they also literally and symbolically enacted a form of dominance over the native environment (consider the naming of indigenous places after British explorers or individuals of political distinction). Close ties existed between the British War Department's Topographical Department and the Royal Geographical Society, whose maps were employed for gathering information about foreign regions, including Africa. In 1867 Sir Robert Napier led a political rescue operation into Ethiopia, generally known as the Abyssinian Campaign of 1867–68, which is purported to have yielded 1500 photographs taken by a corps of Royal Engineers. The fact-finding, scientific contingent of the expedition was directed by Murchison once again, thus bearing further witness to the importance of the medium with regard to the survey in the double sense of the term: a coordinated effort to articulate of boundaries and landmarks and to ascertain features of scientific and political significance in the overall geophysical and ethnological comprehension of an environment.

The Abyssinian expedition was one of several geographical campaigns in which the Royal Engineers participated and included the camera as a survey instrument. Already in 1857, they had begun to work with photographs to assist in North American Boundary Survey. This was a joint enterprise between the United States and Canada to mark the boundary along the forty-ninth parallel to avoid possible contention over gold. Though the Americans had tried their hand at the medium, only the British engineers trained in photography seemed to have success. Their work, mostly produced in the Pacific northwest, comprised an official photographic record that made its way to the Secretary of State for Foreign Affairs in 1863. A corps of Royal Engineers was also hired to undertake extensive mapping and documentation of the Holy Land—Jerusalem, Palestine, and the Sinai Peninsula. Ordnance Surveys were conducted of Jerusalem in 1864, and of the Peninsula in 1868. These were chiefly geographical and scientific in nature, in part privately funded, and especially significant for strengthening the religious ties of Britain with the Judaic and Christian past of the region through the pictorial and cartographic identification of biblical sites. Thus, in the linking of picture with site, and the coordination of pictures with the procedures and symbolic meanings of mapmaking and the topographical survey, the survey became a process that was clearly more than a mere exercise in measurement and pictorial documentation.

While one could cite further cases related to expeditionary enterprise and ideology beyond the few examples discussed thus far, the survey as a projection of a larger vision of expansion is especially well evinced by the grand surveys of the American west between 1867 and 1879. These were geologist Clarence King's US Geological Exploration of the Fortieth Parallel, launched under the auspices of the US Geological Survey; Lieutenant George Montague Wheeler's US Geographic Surveys West of the One Hundredth Meridian; the US Geological and Geographical Survey of the Territories, led by the geologist Ferdinand Vandiveer Hayden; and John Wesley Powell's US Geographical and Geological Survey of the Rocky Mountain Region. The civilian and military men who were the leaders of the surveys recruited photographers to augment the communication of their findings to the scientific community, and to persuade government that additional expenditures for further campaigns were worthwhile. Among the best known of the operators were William Henry Jackson (with the Hayden survey), Timothy H. O'Sullivan (King and Wheeler), Carleton Watkins (King), E.O. Beaman (Powell), and John K. Hillers (Powell). Their works were distributed in stereographic form, single prints, and albums, and reproduced in print media both in the reports of the expeditions and in popular illustrated journals.

Survey activity during the nineteenth century was aligned with the growth and spread of modern institutions. In this period of positivist reliance on observable phenomena for knowledge of the world, photographic images were increasingly accepted as visual evidence of domestic and foreign places and public works important to cultural legacy and national determination. Photographs also began to meet the requirements for pictorial accompaniment in geophysical and anthropo-

logical study. The findings of scholarly, scientific, and government sponsored enterprises as well fostered a demand from the mid-century on for illustrated accounts of these activities in the popular journals. Overall, the quest for new knowledge verifiable through the agency of photography, among other systems of recording, has been characterized as a "compulsive visibility" (Marien, 2002, 79)—a double quest for knowledge, one related to an ideology of power, the other to a democratic idealism that attempted to bring cultural enlightenment to those accorded a place within the domains of western economies.

GARY D. SAMPSON

See also: Royal Engineers; Mission héliographique; Le Gray, Gustave; Le Seq, Henri; Delaroche, Paul; Baldus, Édouard; Blanquart-Evrard, Louis-Désiré; Marville, Charles; Royal Geographical Society; Watkins, Carleton Eugene; and Pictorialism.

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SUTCLIFFE, FRANK MEADOW (1853–1941)

British photographer

Frank Meadow Sutcliffe was born at Headingly on October 6, 1853, the son of Thomas and Sarah Lorentia Sutcliffe. He was the oldest of eight children. As a child Frank slept in his father's studio surrounded by painting equipment, plaster busts of classical sculpture, and a printing press. Thomas Sutcliffe was an artist working in oils and watercolors. He was also an etcher, lithographer and amateur photographer although none of his images appear to have survived. To encourage his children Thomas painted a diorama in one end of his studio complete with lighting and sound effects.

One of Frank's first creative works was achieved on the printing press. It was an etching of two ships used to create a letterhead for himself. The design survives in a letter Frank wrote to his brother Horace in 1869. He also worked as printer of his father's small books of stories written under the pseudonym of Jossy Hullarts. He was also the occasional illustrator of these stories. He had this to say about his childhood:

> I spent much of my childhood running up and down narrow lanes only wide enough for one carriage…The boy who has lived the country life and whose eyes and ears are open to every movement in hedge or bank or tree, is much more likely to have his eyes and ears around him than one who has lived among tram cars and smoke.
>
> When not out of doors my childhood was spent with tiles and bricks. This I believe was a capital education, give a child a heap of squares and triangles, and let him puzzle with them till he makes a picture or at least an ornamental design. He will not be at a loss to know how to place a group of figures afterward. (Frank Meadow Sutcliffe. "Factors in My Success." *The Photogram*, April 1902, 107)

In 1865, at age 14, Frank was apprenticed as a clerk at the offices of Tetley Brewery on Hunslett Lane in Leeds. He lasted eighteen months as an apprentice. This apprenticeship was during a period of his father's illness. While recuperating from his own experience with the city Sutcliffe discovered Lake Price's *A Manual of Photographic Manipulation* published in 1858 on the family bookshelf. His first camera was a 24x18 that he modified to an 8.5x6.5 with a 24" lens. It was John William Ramsden, a portrait photographer and founder of the Leeds Photographic Society who introduced him to the learned photographic journals whose articles covered the latest in scientific and technical matters relating to photography. His early work included portraits and still life studies. He also attempted an image of birds in flight before the use of stop motion photography was common knowledge.

In 1870 Thomas Sutcliffe moved his family to Ewe Cote approximately a mile from Whitby. Thomas died in December of 1871 and by the summer of 1872 Frank is photographing for a client in the Lake District. In 1872–1873 he photographed for Francis Frith a series of views of Yorkshire's abbeys and castles. It was from Frith that he learned to use tracing paper masks to achieve the proper tonal range in prints. He was also advised not to include people in the views since the customer was only interested in the view. During his work for Frith he makes an image called *Sunset after Rain* shot above Rievaulx Abbey. A family friend sent a copy to John Ruskin who invited Sutcliffe to visit him at Brantwood in September 1873 where he photographed Ruskin and the surrounding countryside.

He married Eliza Duck in 1874 and they moved to Tunbridge Wells in 1875 to establish a photographic studio. It was a financial failure and he returned to Whitby in 1876 to establish a studio in Waterloo Yard. It was a one man operation specializing in portraiture. On the verso of a carte mount c 1883 he advertised himself as photographer to Mr. Ruskin, a member of the Photographic Society of Great Britain and prize medals in photographic show in 1881 and 1882. In 1894 he moved the studio to 25 Skinner Street, Whitby where he was able to pursue his portrait work in a state of the art studio. He became a familiar sight in Whitby and developed a rapport with the fishing community. It was the rather rambunctious children of the fishermen who became his water rats. The "Water Rats" is the most famous of his photographs winning a medal at the 1886 Photographic Society Show in London. From his return in 1876 until he sold his business in 1922 Sutcliffe photographed in and around Whitby. His photographs show an understanding of the people and the community of Whitby that is unsurpassed. He began with the collodion wet plate switched to dry plates and then to cameras and roll film provided by Kodak.

In 1892 he joined the Linked Ring whose purpose was to promote photography as an art. He exhibited at the annual Photographic Salon of the Linked Ring from 1893–1904. In 1888 he had a one man show at the Camera Club in London and in 1891 he has a one man show at the Royal Photographic Society. However, it is not until 1935 that he is made an Honorary Fellow of the Royal Photographic Society.

He began writing journal articles in 1875 and went on to become an editorial contributor to *Photography* and between 1895–1913 he regularly wrote for *Amateur Photographer* and contributed to *The Practical Photographer, The Photogram* and *Camera Notes*. He also wrote a weekly column "Photography Notes" for the *Yorkshire Weekly Post* from 1908–1930. In 1922 he became curator of the museum of the Whitby Literary and Philosophical Society and continued in that position until March 1941. He died at his home in Sleights on 31 May 1941.

PAULETTE E. BARTON

Holdings: Royal Photographic Society, Bath; Sutcliffe Gallery, Whitby, Yorks; George Eastman House, Rochester, New York; J.P. Getty Museum, Los Angeles, California; California Museum of Photography, Riverside, California; Museum of Contemporary Photography, Chicago Art Institute, Chicago, Illinois; Boston Museum of Fine Arts, Boston, Massachusettes; Yale University Art Gallery, New Haven, Connecticut.

See also: Frith, Francis; Ruskin, John; Wet Collodion Negative; Camera Design: 6 Kodak (1888–1900); Brotherhood of the Linked Ring; and Royal Photographic Society.

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SUTTON, THOMAS (1819–1875)

English technical writer and photographer

Thomas Sutton was born in London's Kensington district on 22 September 1819. Very little is known about his early life. In 1846, he received a Bachelor of Arts degree from Caius College, Cambridge.

Sutton's first experience with photography was in 1841, when he posed for a portrait in Antoine Claudet's daguerrian portrait studio. At the time he was planning to continue his education in the direction of art, and some advice from Claudet made him consider becoming a photographer. A few weeks later, on a holiday in Jersey, he met an amateur daguerreotypist and started to pursue photography as a hobby; however, his first attempts were unsuccessful.

From 1842–50, study at Cambridge and the demands of married life seem to have prevented him from continuing with photography.

In 1850, he and his wife settled in Jersey, buying some land and building a cottage at St. Brelade's Bay. There he received some lessons from a calotype photographer known only as Mr. Laverty.

From 1851–53, during an extended voyage to Italy and Switzerland with his wife and son, Sutton made the acquaintance of two photographers based in Rome, Frédéric Flachéron and Robert MacPherson. Flachéron gave him further lessons in the calotype process, showing him the wet-paper technique he was using. MacPherson initiated him in the albumen-on-glass negative process. After trying both methods, Sutton settled upon the paper negative process.

Following his return to England in 1853, Sutton was commissioned by the London publisher Joseph Cundall to make twelve prints each of one hundred of his best negatives from Italy. Dismayed by the task, Sutton attempted to arrive at a developing-out printing process similar to the one used by Louis Désiré Blanquart-Évrard—whose photographic printing facility in Lille, France had published several impressive photographic albums. Failing at this, he sent Blanquart-Évrard some negatives he had made since returning to Jersey, asking him to print them. These were published by Blanquart-Évrard in 1854, under the title *Souvenirs de Jersey* [Souvenirs of Jersey]. Sutton also offered to pay Blanquart-Évrard one hundred pounds for the details of his developing-out printing process, but was politely refused.

In 1855, Sutton published a technical treatise titled *The Calotype Process: A Hand Book to Photography on Paper*, which attempted to cover all facets of the photographic process on paper known at the time. This was immediately followed by treatise titled *A New Method of Printing Positive Photographs, By Which Permanent and Artistic Results May be Uniformily Obtained*, in which Sutton outlined the steps for a developing-out printing process using whey, or milk-serum. The success of this procedure induced Prince Albert to suggest that Sutton set up a photographic printing facility.

Aware that he lacked experience with full-scale industrial printing, Sutton again contacted Blanquart-Évrard, asking for his assistance in establishing the printing facility. Blanquart-Évrard—at this point suffering from financial difficulties and realizing that Sutton's published procedure was a serious rival to his own—accepted the offer, and invited Sutton to tour his printing facility in Lille. There he showed Sutton his industrial printing methods without reservation, which Sutton later described in an 1862 article. Blanquart-Évrard's printing facility was then shut down; and in September 1855, the two men launched a new printing facility at Jersey, the Establishment for Permanent Positive Printing.

Sutton's business partnership with Blanquart-Évrard lasted about two years. During this time they published, at irregular intervals, a series of installments to a larger work titled *The Amateur's Photographic Album*. Each installment contained three to four photographs and sold for the price of six shillings. In January 1856, they also launched a photographic journal titled *Photographic Notes*, which ran as a monthly journal at first, then becoming fortnightly from September 1856. Blanquart-Évrard's contribution to either of these undertakings has yet to be fully determined.

As the editor of *Photographic Notes*, Sutton proved himself to be a venomous and opinionated writer. The journal was used for launching personal attacks and new photographic innovations were often treated with derision and scorn—only to be accepted in a contradictory, face-saving manner once Sutton's initial reactions had been proven wrong.

Largely overlooked, but nevertheless important, are a number of articles Sutton wrote and published in *Photographic Notes* during the years 1856-61, in which he expanded upon his earlier, 1855 developing-out treatise. Here he outlined a method of developed-out salt printing that yielded results virtually indistinguishable from ordinary, printed-out salted paper, while at the same time requiring much less exposure to light.

In 1858, Sutton published *A Dictionary of Photography*, which featured encyclopedic articles on every aspect of the photographic process, mostly written by himself.

By the late 1850s, Sutton's interests appear to have moved away from the chemical operations of photography and more towards optics. In 1859, he wrote that a triplet lens he had made from two opposing, achromatic plano-convex elements, with a small, bi-concave quartz element in between, corrected curvilinear distortion and curvature of field. But the lens was never manufactured. This was followed in 1860, by the introduction of a ball-shaped water lens, capable of a 100 angle of view. The lens was formed by two opposing positive meniscus elements, with water in between also acting as an optical component. The lens reached a limited scale of production and was capable of producing fine images, but was never widely used—in part because it required a curved ground glass, curved negative plates, and a curved contact printing frame.

In 1861, Sutton was appointed lecturer on photography at King's College, London, where he succeeded T. Frederick Hardwich; but within a few months he had resigned from the position, citing domestic problems caused by repeated travelling between Jersey and London.

In 1867, Sutton terminated his involvement with *Photographic Notes*, it then being absorbed by *The Illustrated Photographer*. Sutton and his family moved to Redon, in Brittany. There he lived in semi-retirement, contributing articles to the *British Journal of*

Photography, most notably his "Reminiscences of an Old Photographer," which was published under a pseudonym.

In 1874, Sutton moved to Pwllheli, in North Wales. He died very suddenly, allegedly from stomach cramps, on 19 March 1875.

ALAN GREENE

Biography

Thomas Sutton was born on 22 September 1819 in London. After studying at Caius College, Cambridge, he and his family moved to the island of Jersey. In the early 1850s, he made a number of calotype views of Rome, aided by lessons obtained from Frédéric Flachéron. Wanting to print his negatives from Rome, he became interested in the industrial, developing-out printing process of Louis-Désiré Blanquart-Évrard. This led him to devise a developing-out process of his own, the details of which he published in 1855. In 1855–1857, Sutton and Blanquart-Évrard founded an industrial titled photographic printing facility at Jersey. During this time they also started a journal *Photographic Notes*, which Sutton continued to edit until 1867. A prolific writer, Sutton wrote a number of technical manuals, contributed articles to different photographic journals, and compiled a photographic dictionary. He also was interested in optics, designing a triplet lens and a wide-angle duplet lens filled with water. He died on 19 March 1875 in Pwllheli, North Wales.

See also: Blanquart-Évrard, Louis Désiré; Calotype Process; Claudet, Antoine; Flachéron, Frédéric; Lenses: 1. 1830s–50s, MacPherson, Robert; and Wet-Collodion Process.

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SUZUKI SHINICHI STUDIOS

The Japanese photographers Suzuki Shinichi I (1835–1919) and Suzuki Shinichi II (1855–1912) were simultaneously apprenticed to Shimooka Renjo. The connection was that Suzuki II married Suzuki I's daughter. Suzuki I was born Takahashi Yujiro in Izukuni. In 1854 he married into a Suzuki family, adopted the family name, and moved to Shimoda. That year he lost everything in a tidal wave and moved to Yokohama. In 1866 he became apprenticed to Shimooka and then left in October 1873 to set up his own Yokohama portrait studio which also sold souvenir albums to foreigners. That year he also changed his given name to Shinichi and saw his daughter married to Okamoto Keizo, also apprenticed to Shimooka. Okamoto changed his name to Suzuki Shinichi II. Suzuki I pioneered a technique for printing photographs onto porcelain and authored the *shajo* series which realistically documented the life and customs of rural communities. Retiring in 1892, his son Izaburo changed the studio name to I.S. Suzuki.

Suzuki II was born in Izu. Originally intending to be an artist, he switched to photography and in 1870 apprenticed to Shimooka for seven years. In 1876 he opened his own studio in Nagoya. Although successful, in 1879 he decided to improve his technical knowledge by studying for one year with the famous Isaiah West Taber in San Francisco, becoming the first Japanese photographer to study abroad. Returning to Japan he built an extensive studio complex in Tokyo which was known as the 'branch studio' to Suzuki I's Yokohama premises. Suzuki II won prizes at Japanese and European exhibitions, and he photographed many famous statesmen and members of the Japanese royal family. His success peaked in around 1896 and shortly afterwards he lost everything after speculating in the shipping business. He died in relative poverty and obscurity in 1912. Examples of work from the Suzuki studios can be found in the Tokyo Metropolitan Museum of Photography, Tokyo.

TERRY BENNETT

See also: Shimooka Renjo.

SWAN, JOSEPH WILSON (1824–1914)

British scientist and inventor

Born in Sunderland on October 31,t 1824, the physicist and electrical visionary Joseph Wilson Swan originally

trained as a chemist. Earlier in his career he was appointment as an assistant, and later partner, to the Newcastle chemist John Mawson. The company later became Mawson & Swan.

Swan is most widely remembered as the inventor of the incandescent filament electric light bulb in 1860. Due to the poor quality of vacuum pumps at the time, it took a further twenty years before he was able to demonstrate a lamp with sufficient luminance to be practical. By 1880 he had set up the Swan Electric Light Company.

In photography, Swan is credited with the introduction of the first practical carbon printing process in 1862—based on Alphonse Louis Poitevin's 1855 patent. He is also credited, in the 1870s, with the introduction of the gelatine bromide dry plate which evolved into the mainstay of the photographic industry and, a few years later, with the introduction of bromide printing papers.

With the chance discovery—while investigating materials to make electric light bulb filaments—of how to make fibres out of nitro-cellulose, he is credited with the creation of one of the first man-made fibres, later used widely in textile manufacture.

Swan was knighted in 1904, and died in Surrey on May 27, 1914.

JOHN HANNAVY

SWEDEN

News of the invention of photography reached Sweden with the speed of the stage-coach. Three weeks after Daguerre's invention had been briefly announced in Paris, a newspaper in Stockholm was able, on 28 January 1839, to report "one of the most important inventions of the century." More details became available during the autumn, after Arago's big introduction, and at Christmas that year, the bookseller Adolf Bonnier published a Swedish translation of Daguerre's manual.

Among those who bought the book were, naturally enough, the scientist Jacob Berzelius and his circle. He, as well as Carl Wilhelm Scheele before him, had been responsible for some of the chemical findings which made photography possible. The Swedish Academy of Science published continuous reports on the advances made in photography.

The pioneers, however, were to be found elsewhere. *G. A. Müller*, stage designer at the Royal Opera, acquired photographic equipment together with *U. E. Mannerhjerta*, once a pioneer in lithography and at this time a translator of French plays. Müller had learned his craft as an assistant of Gropius in Berlin, the stage decorator who had built his own Dioramas as direct copies of Daguerre's stage designs.

This was early in 1840, when another lithographer, the young Liutenant *L. J. Benzelstierna*, received an apparatus from the Swedish ambassador in Paris. In September 1840, these three men exhibited their views of Stockholm at the Royal Museum.

At the same time the visting French merchant Neubourg exhibited his Daguerreotypes in the Old Town, a few blocks away from the castle. One year had passed since the official announcement of the new invention, and four photographers were already exhibiting.

Müller and Mannerhjerta soon abandoned the daguerreotype. Müller followed Daguerre and built a Diorama in Stockholm. Benzelstierna became our first professional photographer, although not by selling his images: He choose instead to demonstrate, for an admission charge, the entire complicated process involved with the slivered copper plates. For almost two years he travelled Sweden, photographing and exhibiting.

While Benzelstierna toured the countryside with his rapidly ageing technique, new daguerreotypists were appearing in larger towns and cities. Many of the itinerant photographers during the first decades were Danish and German. Some of them took their time to train assistants and apprentices.

The greatest portraitist of this era was *J. W. Bergström*, whose life began in poverty and ended in riches: After ten years as a daguerreotypist he turned his interest to industry and made a fortune as a manufacturer. He left behind him a large work of masterly portraits, but it is his pictures from the sphere of his private life that attract our greatest interest.

Gradually, the itinerant daguerreotypists introduced new methods as the ambrotype. The style remained however the same. From the glass plates were also made positives on salt or albumen paper. Paper was also tried as negatives. The pioneers appear to have been *David Gibson* in Gothenburg 1851 and the painter *C G Carleman*, who was later to be one of the inventors of the halftone block. His first halftone blocks were printed in Swedish magazines in 1871.

The introduction of better negative-positive processes and the *carte-de-visite* format created a boom. The number of professional photographers increased from 12 in 1860 to 65 in 1865. Among them, an elite of about 20 organised themselves in a professional association.

The most legendary studio of the era was established by *Johannes Jaeger*, a German who after a few iterant years settled in Stockholm in 1863. In Gothenburg his equivalent was *Aron Jonason* The artistically inspired photographers included *Frans Klemming*, closely related to the school of national romanticism.

While studio photography developed technically, the first amateurs appeared with a freedom to choose their motifs. *Carl Curman* was a doctor, and the pioneer of the Swedish bathing resort. As a photographer he emphasised the greatness of nature in a romantic style. Painter

Severin Nilson was his opposite, using his camera to document the poor and urban slum areas.

August Strindberg tried photography during a few intensive periods. A journey through the French countryside aimed to create a social documentation in a new way, but his disregard for established techniques made the material unusable. Another project to photograph clouds failed for similar reasons. But the existing body of around 60 pictures consists mainly of strong portraits and auto portraits.

Several of Sweden's best photographers have been immigrants. To a greater extent, a number of Swedish photographers have produced their most important work in other countries. The most famous was *Oscar Gustav Rejlander*, who studied painting in Rome before moving to England. His "art photography" attracted a wide audience in the 1850s.

Otto Wegener, from the south of Sweden, opened in 1883 an elegant studio in Place de la Madeleine in Paris, competing with Nadar the Younger and Reutlinger. He signed his works simply by using his Christian name Otto. His period of fame lasted until the end of the century but the body of his work seems lost. Hence, he is overlooked by photo historians, except for a few footnotes in connection with his apprentice Edward Steichen.

John A. Anderson photographed lumberjacks and railroad workers in California, *Eric Hägg* documented the Gold Rush in the Klondike and *Gustaf Nordenskiöld* explored the ancient rock dwellings in Meza Verde, Colorado.

The Swedish tourist Association was formed in 1885 as a part of a nationalist movement. To help Swedes discover their own country, photographers were invited to portray landscape, wildlife an people in their home regions. A generation of versatile professionals found a reason to get out of the studios and deliver coherent portfolios of cities and countryside.

The signals of pictorialism were rapidly registered in the 1890s. Amateur *Gunnar Malmberg* and the professional *Herman Hamnqvist* were the first to introduce the gum bichromate process. The pictorialist era was dominated by photographers as *Ferdinand Flodin*, *John Hetzberg* and *Henry B. Goodwin*, but their main oeuvre was created after the turn of the century.

PÄR RITTSEL

See also: Wegener, Otto.

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SWITZERLAND

The first announcement of Daguerre's discovery appeared in the Schweizerischer Beobachter on the 19th January 1839 and the first specimens of the new process were shown in St-Gallen and Zurich as early as October of the same year. In 1840, the French itinerant photographer named Compar was touring the country, followed by many others introducing the daguerreotype to an interested public and teaching its technique.

Even though the physicist and professor of veterinary surgery at the University of Bern Andreas Gerber (1797–1872) claimed in February 1839 to have been able to fix microscopic prints on silver chloride paper as early as 1836, one of the most important pioneers of early Swiss photography remains Johann Baptist Isenring (1796–1860), a landscape painter and engraver from St-Gallen. He succeeded in obtaining excellent portrait daguerreotypes already in November 1839. And in August 1840 he showed in his first photographic art exhibition ever examples of his art in St-Gallen, and later in Zurich. As an itinerant photographer, he worked and traveled with a "sun-wagon" in Switzerland, Southern Germany, and Austria.

During the 1840s, daguerreotype studios appeared in many cities. Beginning in 1841 the sculptor Antonio Rossi (1823–1898) ran a Kabinett in Locarno.

The optician and precision mechanic Friedrich Gysi (1796–1861) in Aarau added another branch to his business by producing daguerreotypes from 1843 onward, while in 1847 another optician, Emil Wick (1816–1894), decided to change profession and became the first daguerreotypist in Basle. Franziska Möllinger (1817–1880) began taking daguerreotypes views of main cities and landscapes around 1844. She published 15 of them as an edition of lithographs but only one original daguerreotype by this first Swiss woman photographer has come down to us. The lithographer Carl Durheim (1810–1890) in Bern produces daguerreotypes since 1845.

In the French-speaking part of Switzerland the diffusion of the new medium happened differently. Sev-

Durheim, Carl. Postmortem of a Child.
The J. Paul Getty Museum, Los Angeles
© The J. Paul Getty Museum.

eral aristocratic families enjoyed close relationships to France and its scientific milieu and it is rather through this network that photography was introduced. A banker in Geneva, Jean-Gabriel Eynard Lullin (1775–1863) produced as an amateur daguerreotypist a remarkable photographic oeuvre depicting his relatives, his friends and his mansions. The mathematician and astronomy professor in Lausanne, Marc Secretan (1804–1867) published his ³Traité de photographie² in Paris in 1842. At the same time Les Excursions daguerriennes were issued by Lerebours, for which the painter, engraver and collaborator of Secretan, Frederik von Martens (1806?–1885?), engraved a few plates. In the early 1840s, the tinsmith Samuel Heer-Tschudi (1811–1889) provided them both with metal plates for their daguerreotypes, before he himself turned daguerreotypist in the mid 1840s. Despite the several mentions in the newspapers of views of cities, buildings and landscapes, the daguerreotypes which have survived are almost exclusively portraits.

Adrien Constant Delessert (1806–1876) who entertained close links with international photographic circles and was recognized as a photographer as well as a scientist, was instrumental in transmitting the technique of the Calotypes. Paul Vionnet (1830–1914), Secretan's nephew, learnt it from him in 1845 and was to use it as a means of documenting old buildings, monuments and landscapes. The tradesman Jean Walther (1806–1866) in Vevey, also taught by Constant Delessert in 1850, worked locally but took a series of remarkable views of Athens. Around 1855–60, Charles de Bouell produced a series of salt prints representing Basle and the archeologist, historian and politician Auguste Quiquerez (1801–1882, perhaps together with his son Edouard) documented the Canton of Jura with more than a hundred pictures of monuments, ruins and landscapes. In 1852/53, Carl Durheim created one of the most interesting group of Calotypes, the first large body of police photographs: about 220 portraits of itinerants without citizenship, vagabonds and criminals, commissioned by the new Federal Government. The use of photography for police purposes was introduced on cantonal levels soon after that. Many daguerreotypists began offering salted prints in the early 1850s, like Durheim in Bern, Christian Müller in Zurich or Wick in Basle.

Around 1860 large family businesses began emerging, most of them devoted to portrait photography and the production of local views. The Taeschler studio, founded by the watchmaker, painter, and later itinerant photographer Johann Baptist Täschler (1805–1866) was established in St. Fiden (near St. Gallen) in 1850 and forced to close after WWI. The German Jakob Höflinger (1819–1892) settled down in Basle in 1857. His firm did not flourish however, until the introduction of the *carte-de-visite*. His son, Karl Albert (1855–1936), and his nephew, August (1867–1939), took up the business in 1885 and managed it until the 1910s. The inventor of the Pinacoscope (a projector for colored slides), Johannes Ganz (1821–1886) opened a store in Zurich in 1859. His son Rudolf (1848–1927), a great portraitist, sold the company to Camille Ruf (1872–1939) in 1902. Another German, Johann Linck (1831–1900) arrived in Winterthur in 1863 and opend his own studio a year later. Apart from portraits, Linck specialized in exterior and interior views of the plants and factories in town documenting the booming industrial growth beginning in the 1870s.

Henri-Antoine Boissonnas (1833–1889) active in Geneva in the clock-making industry started a new business in 1864–65, succeeding the photographer Auguste Garcin (1816–?). First taking landscape and city views, he specialized in children portraiture. After his death his sons took over, Edmond-Victor (1862–1890) inventing ³Orthochromatic² plates, for which he received a silver medal in the Vienna photographic exhibition of 1882. Fred (1858–1946), the most famous of the family, was a successful businessman and a great artist at the same time, creating refined studio portraits and impressive tableaux vivants. He experienced with a large variety of printing techniques and became one of the only internationally recognized Swiss Pictorialists. Since the 1860s, the most important portrait atelier for the Lausanne bourgeois society was run by the De Jongh family. After working with Niepce de St-Victor in France, Alphonse Dériaz (1827–1889) established himself in Morges in the 1870s taking studio portraits and occasional industrial views. His son Armand (1873–1932) opened a business for postcards and alpine panoramas.

Early examples of Swiss landscape photography are scarce: Durheim took a few pictures of the Bernese Oberland as early as 1849, Samuel Heer even earlier, but no trace of the latter's pictures survive. However, Swiss landscapes became well known through the work of foreign photographers, artists, scientists, alpinists and travelers like Adolphe Braun, Francis Frith, William England, Giorgio Sommer, who produced large corpuses covering the whole country, or like Aimé Civiale, F. Donkin, G. Roman, the Bisson brothers. who focused on the Alps. Around 1860, it was Garcin from Geneva who provided Swiss views for tourists. Johann Adam Gabler (1833–1888) in Interlaken did the same in alpine areas beginning in the 1860s just as Romedo Guler (1836–1909) in Davos would do in the Grisons a decade later.

Carl August Koch's (1845–1897) alpine photographs attracted attention in the National Exhibition of 1896 in Geneva.

Even if the Charnaux brothers took pictures in the Alps, they are better known for the very broad selection of views of Switzerland they offered in the 1870s and 1880s, thus anticipating the industrial ventures of the firms Schroeder & Cie, Photochrom (later Photoglob after the fusion with Schroeder in 1895) and Gebrüder Wehrli, which merged into Photoglob in 1924. These tree companies flooded the market with commercial images of all areas of the country. Whereas the brothers Wehrli produced only black and white pictures, Photochrom specialized in polychrome photolithographs taken by its anonymous operators all over the world and sold to an increasingly picture-hungry international audience.

SYLVIE HENGUELY

See also: Bisson, Louis-Auguste and Auguste-Rosali; Braun, Adolphe; England, William; Niépce de Saint-Victor, Claude Félix Abel; Sommer, Giorgio; Frith & Co, Photoglob Zurich /Orell Fussli & Co; Itinerant Photographers; Tourist Photography; Civiale, Aime; Delessert, Edouard and Benjamin; Isenring, Johann Baptist; Martens, Friedrich; and Rossier, Pierre.

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SZATHMARI, CAROL POPP DE (1812–1887)

Romanian portrait photographer

The Romanian photographer Carol Popp de Szathmari was born in Transylvania and moved to Bucharest by the age of eighteen. He trained in art, and embarked

on a career as a court painter before taking up the daguerreotype c.1844 and establishing himself as a portrait photographer. By 1848 he was using albumen-on-glass. By the early 1850s, he was working with collodion.

Szathmari took his camera to war a full year before Fenton, photographing the early months of the Crimean conflict along the River Danube. He also reportedly had a horse-drawn darkroom van with him, and, like Fenton, found himself under fire.

Unlike Fenton and others, whose photography was unashamedly partisan, Szathmari's political contacts enabled him to photograph the war from both sides. Thus his images showed the Russian troops and their fortified positions as well as Turkish units, field hospitals and military leaders. It was while working at a Russian field hospital that he came under fire from the Turkish artillery.

After the war, Szathmari compiled albums containing 200 images from the campaign which were widely acclaimed throughout Europe. Amongst the reported recipients of copies of the album were Napoleon, Queen Victoria, the Emperor of Austria, and the pianist Franz Joseph Liszt. The images were exhibited at the Exposition Universelle in Paris in 1855.

He also photographed the Turkish-Russian-Romanian War of 1877 at age 65.

JOHN HANNAVY

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TABER, ISAAC WEST (1830–1912)

Isaac West Taber was born in New Bedford, Massachusetts on August 17, 1830. In 1854, Taber opened a daguerrotype studio in the town, and with his brother Freeman Augustus Taber, subsequently ran a studio in Syracuse, New York, 1857–1864. Taber then moved to San Francisco, operating on behalf of Bradley & Rulofson until opening his own gallery in 1871. He took over Carleton Watkins Gallery in 1876.

Taber exhibited prominently in the 1877 San Francisco Art Association show, and the Mechanics' Institute Exhibition in 1880. In 1880, he published *Photographic Album of Principal Business Houses, Residences and Persons*, as a promotional venture, and photographed Kalakaua, King of Hawaii during a Pacific cruise. In 1885 Taber developed a method for enlarging and printing fingerprints, and opened a factory for dryplates. In 1894 Taber obtained exclusive rights to photograph within the grounds of the San Francisco Midwinter Fair, and in 1897 opened a branch of the Taber Bas Relief Photographic Syndicate in London.

Taber's studio was totally destroyed in the San Francisco earthquake of 1906, including 80 tons of portrait negatives. He died at his home in San Francisco on February 22, 1912.

DAVID WEBB

Taber, I. W. Glacier Point 3,201 feet, Yosemite, Cal.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

TABLEAUX

The tableau is a combination of visual and theatrical arts, consisting of costumed figures arranged in static poses so as to create the effect of a picture. In the nineteenth century, the tableau vivant, or living picture, imitating a well-known work of art or literary passage, was tremendously popular both as a private amusement and as public entertainment. In their most elaborate form, carefully posed and lit tableaux were staged behind large gilt frames, covered with a layer of gauze that imitated the effect of varnish on an old painting (Stevenson, 45). Tableaux flourished during photography's first half-century, especially in Britain, where the two phenomena, tableaux and photography, often coincided. Not only did figures holding still in a tableau lend themselves to being photographed, but to make an artistic or pictorial photograph with figures, one in effect had first to construct a tableau.

Carroll, Lewis. Tableau with Xie Kitchin as the Damsel in distress with St. George and the Dragon.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

With roots in medieval and Renaissance pageants, the modern tableau emerged in the eighteenth century. In his writings on the theater of the 1750s and 1760s, Denis Diderot argued that stage productions should create emotional and moral effect like the best painting of the day by presenting deliberate tableaux at critical moments in the drama. In Naples in the late eighteenth century, Lady Emma Hamilton famously assumed frozen "attitudes" after figures on Greek vases and ancient statues. This activity would soon be echoed in a music hall entertainment, the *pose plastique*, where partially dressed figures assumed positions suggesting classical statuary (Stevenson, 57). In 1809, Goethe prominently featured the practice of staging tableaux vivants in his novel *Elective Affinities*. Tableaux vivants became especially popular in Great Britain when the Scottish painter Sir David Wilkie, having witnessed in a German theater a tableau after a painting by David Teniers, began arranging figures after famous paintings and literary works. In his most well known examples, based on the stories of Sir Walter Scott, Wilkie constructed elaborate scenes requiring weeks' preparation, all for brief performance (Stevenson, 46). The amusement of staging tableaux was enjoyed among the highest classes of British society, including the royal family.

In 1845 David Octavius Hill and Robert Adamson photographed a number of tableaux after Scott featuring medieval costumes, using as models friends who were practiced in the art of assuming characters and holding poses from having enacted tableaux. These works related both to literary painting of the day and to the contemporary craze for tableaux vivants. They also helped to initiate a trend of fictional photographs in which groups of two or more figures enact a scene for the photographer. As with tableaux, such images might refer to historical or allegorical themes, or to recognizable moments from everyday life.

William Lake Price, who created elaborate costume photographs after literary sources such as *Don Quixote* and *Robinson Crusoe* in the mid-1850s, noted the difficulty of photographing figure groups, attempts at which marked much ambitious art photography in the Victorian era. When O.G. Rejlander produced his intricate composition photograph *The Two Ways of Life* in 1857, he was trying to exceed the limitations of photography in rendering complex figural arrangements, by combining a number of discrete tableaux into a larger scene that itself resembled an elaborate tableau vivant. It has often been noted that Rejlander employed professional models from a troupe of *pose plastique* actors, accustomed to partial nudity and long poses, for *The Two Ways of Life*, and it has been suggested that some of the negative criticism directed toward the work may have derived from the picture's associations with the "debased art form" of commercial tableaux vivants and *poses plastiques* (Daniel, 15).

Rejlander more directly copied specific paintings in a number of studies, made after the old masters, in which, wrote the critic A.H. Wall in *The Photographic News* of 31 December 1886, "he selected models, illuminated,

and posed them in imitation of some of the grandest masterpieces in the public galleries, and then photographed them" (Wall, n.p.). Wall recommended this practice as the best training for an aspiring art photographer, who, like Wilkie with his tableaux, needs to know how to make pictures out of living models. The problem of the imperfect model as opposed to the idealized figures of painting was often noted in mid-century photographic criticism, suggesting that photographs of pictorial or literary subjects were tainted by the intermediate step of needing to construct a tableau with real people as actors. At the same time, however, there was quite a vogue in British photography for just such images among professionals and amateurs alike.

Both Henry Peach Robinson and Lewis Carroll frequently staged scenes that were meant to conjure up paintings or that made literary reference. Whereas Robinson's efforts are professional in the extreme, using hired models and carefully constructed scenarios, Carroll's tableaux involving children, such as *St. George and the Dragon*, ca. 1874, are notable for their playful, amateurish quality. For her *Studies* of the 1860s, Viscountess Clementina Hawarden, while spurning period costumes and props, posed her figures in attitudes reminiscent of paintings as well.

A new dimension was added to the photographic tableau with the advent of stereoscopic photography. From the 1850s through the 1880s and beyond, narrative tableaux became a staple of commercially published stereographic cards internationally. This hugely popular form came to involve extensive story-telling sequences of photographic tableaux, common at the turn of the century (Henisch and Henisch, 70–77).

Among art photographers, perhaps the work of Julia Margaret Cameron most consistently and ambitiously incorporates the tableau. Her Madonnas and saints, allegorical figures, and subjects from poetry involve servants, family, or friends costumed and arranged in sometimes quite elaborate mises en scène. These works, enacted wholly for the camera, often allude to the amateur theatrical, with spare, makeshift stages and distinctly non-professional actors. For one of her last and most involved projects, Cameron in 1874 spent several months, and enlisted dozens of models, to produce twelve large-scale photographic images of Arthurian subjects to illustrate a volume of her friend Alfred Lord Tennyson's *Idylls of the King* (Bajac, 5). Critics and historians in the mid-twentieth century would condemn such works of the Victorian art photographers as misguided attempts to produce "imitation paintings," preferring, in the case of Cameron, her simple and direct portraits to her fanciful literary scenes. With the shift to a postmodern aesthetic in the late twentieth century, however, the practice of staging fictional scenes again came into prominence in photography, and with it a renewed appreciation for the role of the tableau in nineteenth-century photography.

STEPHEN PETERSEN

See also: Art photography; Cameron, Julia Margaret; Dodgson, Charles Lutwidge (Carroll, Lewis); Genre; Hawarden, Viscountess Clementina Elphinstone; Hill, David Octavius, and Adamson, Robert; Rejlander, Oscar Gustav; and Robinson, Henry Peach.

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TAFT, ROBERT (1894–1955)

Born of missionary parents in Japan in 1894, Robert Taft grew up in the U.S. After receiving a B.A. in history in 1916 and a Master's in 1919, he joined the University of Kansas where he obtained a Ph.D. in chemistry (1925) and taught chemistry until his death in 1955. An amateur of art and history, Taft was drawn to photographic history upon realizing, around 1932, that no existing book would satisfy his curiosity about early photography in the American West. He started amassing information by exploring the 19th-century press and writing old-timers and local historical societies. Out of this enormous personal effort came a series of articles in Kansas and other Western magazines, followed by his masterful Photography and the American Scene: A Social History 1839–1889 (1938), the first comprehensive history of American photography, which has become a classic of the socio-cultural history of the medium. Along with many lesser publications on photographic history he also

made a major contribution to Western American cultural history with his Artists and Illustrators of the Old West (1955). The extensive collection of Taft's papers at the Kansas State Historical Society is a major resource for further understanding of this often underestimated photo-historian.

François Brunet

TALBOT, WILLIAM HENRY FOX (1800–1877)

William Henry Fox Talbot, photographic inventor, mathematician, etymologist, Assyriologist, and botanist, was born 11th February 1800 at Melbury in Dorset, the home of his maternal grandfather, Henry Thomas Fox-Strangways, the 2nd Earl of Ilchester. His father, William Davenport Talbot (1764–1800), was a Captain in the 88th Foot Regiment. His mother, Lady Elisabeth Theresa (née Fox Strangways) (1773–1846) was the daughter of the 2nd Earl of Ilchester and his first wife Mary Theresa.

When Talbot was five months old his father died leaving him the Lacock Abbey estate and over £30,000 in debt. In order to pay back these debts, Lacock Abbey had been let out to the Countess of Shrewsbury starting in 1795, and after her death in 1810 to John Rock Grosset, the local Member of Parliament. Talbot spent his youth living in a variety of relative's homes or away at boarding school. It wasn't until Talbot reached the age of 27 that he finally took possession of the Abbey and began to make it his home. In 1804, Talbot's mother married Captain Charles Feilding (later Rear Admiral). His attention both to the Lacock estate and to his stepson brought stability to both. Talbot's mother and Feilding had two daughters, Caroline Augusta (1808–1881, later Lady Mt Edgcumbe), and Henrietta Horatia Maria (1810–1851, later Henrietta Gaisford), who both showered affection on Talbot and influenced him with their artistic interests and talents.

Education

Talbot's earliest educational experiences were, certainly, at his mother's knee. Her knowledge of languages and the essentials of the classics, frequently presented in the form of games, was the foundation of Talbot's tutelage. Long periods during his childhood spent at Penrice, his aunt's home in the Welsh countryside, collecting shells, stones and plants initiated Talbot's life-long interest in the natural sciences, especially botany. His mother and stepfather's frequent trips on the continent also gave the young Talbot a broader view of life and put him in contact with important people.

From the age of eight, Talbot was a boarding student of the Reverend Thomas Hooker's school at Rottingdean in Sussex. Here he expanded his knowledge of Latin and French while reading and translating literary works, also continuing his interest in botany.

From age 11, Talbot attended Harrow, living in the Head Master's House under the watchful eye of the Reverend George Butler, a man he highly respected. This seemed a most satisfactory time for Talbot who made many friends, took part in sports and, with his friend Walter Calverley Trevelyan, went in search of botanical specimens culminating in a handwritten book on the 'Flora of Harrow.'

After leaving Harrow at the top of his class, but still too young to enter university, Talbot was tutored first by the Reverend Theophilus Barnes at Castleford, Yorkshire, and second by the Reverend Thomas Kaye Bonney at Normanton in Rutlandshire.

Talbot's years at Trinity College Cambridge (1817–1821) were centred on a passionate interest in mathematics, which, at that time, was seen as one of the consuming interests of Cambridge itself. In order to get a first class BA, a student had to sit for the 'Tripos,' then the most demanding and prestigious examinations in the country. Talbot received his first class BA and was named 12th Wrangler, disappointing his mother who had hoped he would be named Senior Wrangler. Talbot proceeded MA in 1825.

> Far from excelling only in mathematics, Talbot also received the Porson prize for his Greek Iambic translation of Macbeth, and the second Chancellor's Classical Medal.

Family Life

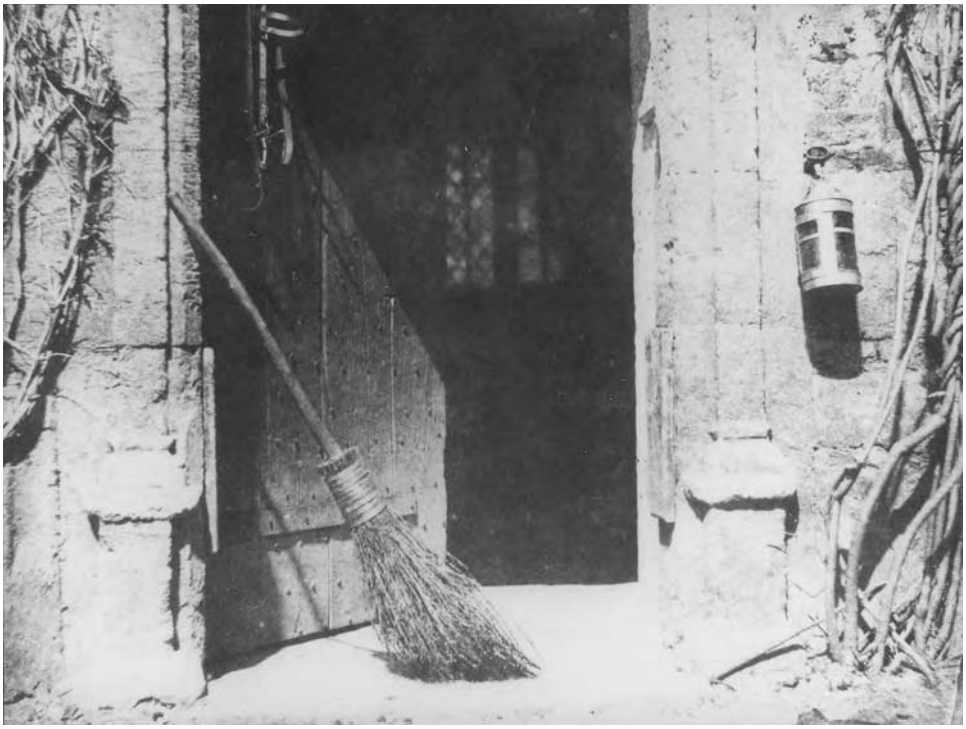
In December 1832, Talbot married Constance Mundy of Markeaton Hall in Derby. Their marriage took place at All Souls Church in Langham Place, London. They had four children: Ela Theresa (dsp), Rosamond Constance (dsp), Charles Henry (dsp) and Matilda Caroline who married John Gilchrist Clark of Scotland.

First Experiments

In the first fascicle of Talbot's Pencil of Nature published in 1844, he writes of the epiphany that led him to the discovery of photography. In the opening pages he relates:

> One of the first days of the month of October 1833, I was amusing myself on the lovely shores of the Lake of Como, in Italy, taking sketches with Wollaston's Camera Lucida, or rather I should say, attempting to take them: but with the smallest possible amount of success. For when the eye was removed from the prism—in which all looked beautiful—I found that the faithless pencil had only left traces on the paper melancholy to behold.

He considered using the camera obscura for drawing, as he had on earlier trips to the continent, but this too



Talbot, William Henry Fox. The Open Door. *The Metropolitan Museum of Art, Gilman Collection, Purchase, Joseph M. Cohen and Robert Rosenkranz Gift, 2005 (2005.100.498) Image © The Metropolitan Museum of Art.*

required some previous drawing skill on the part of the amateur artist.

> It was during these thoughts that the idea occurred to me... how charming it would be if it were possible to cause these natural images to imprint themselves durably, and remain fixed on the paper!

Talbot's first experiments, beginning in the spring of 1834, involved coating common writing paper with silver nitrate both alone and in combination with sodium chloride. Too slow for use in a camera obscura, his first images were sunprints created by placing botanical specimens onto the sensitive paper and exposing it to the sun. The greater challenge he faced was that once the paper had been made sensitive to light and an image was formed, it was necessary to somehow halt this sensitivity so that the image would remain. Although creating paper sensitive to light was straightforward, and was known to have been achieved as early as 1800 by Thomas Wedgwood, the inability to halt the sensitivity meant that images would continue to print out until the paper was black.

In examining early prints, Talbot noticed that some areas appeared morelight sensitive than others. He attributed this to varying proportions of sodium chloride to silver nitrate. Further experiments showed that less sodium chloride made the paper more sensitive to light. He reasoned from this that if a light coating of sodium chloride made sensitive paper, it could then be desensitised or stabilised by soaking the finished print in a bath of saturated sodium chloride.

Sciagraphs or Photogenic Drawings

To make the paper sensitive enough to be used in the camera obscura, he found that multiple coatings of silver nitrate and sodium chloride would increase the sensitivity to an extent that exposures could be made in one of several small, crude box cameras fitted with microscope eyepiece lenses that were made for Talbot and his experiments. Exposures were long as he was still relying on the action of light alone to bring out the image. He had not yet discovered the latent image.

He began writing up his results in late 1838 for presentation to the Royal Society. However, in January 1839 word came from Paris that a Frenchman named Louis Daguerre had also created a photographic process, although no details were published on the actual process itself. Fearing that his labour in developing this process might be in vain should Daguerre's process turn out to be identical to his, Talbot pulled together the samples that he had made previously and on 24th January, Michael Faraday exhibited them at the Royal Institution. On the 31st of January, Talbot's paper 'On the Art of Photogenic Drawing' was read to the Royal Society in London. He then revealed the full working method of the process in a letter read to the Royal Society on the 21st of February. When Daguerre's process was disclosed in August of 1839, it revealed that there was no overlap between the two processes. The strong support for Daguerre by the government of France and the French scientific community, combined with the fact that the daguerreotype was made to be used in a camera, meant that Talbot's process was obscured in the press and public discourse.

Calotype Process

Talbot continued with his experiments attempting to make the paper sensitive enough to be easily used in a camera and trying different methods for fixing the image after exposure. His friend, Sir John Herschel, recommended the use of 'hyposulphite of soda' as the best fixing agent and after some months of experiments, Talbot began to use that for the vast majority of his work. The photogenic drawing process was successful as far as it went, but Talbot took a large leap forward in his work when he discovered in September 1840 that a short exposure to light was enough to create a latent image on the paper which could then be brought out by chemical development. This single change brought exposure times down from minutes or hours to seconds.

More than an improvement on Photogenic Drawing, the Calotype was virtually a new process. Although he had given his Photogenic Drawing process free to the world, through the urging of his mother and his friend Sir David Brewster, Talbot took out a patent on the calotype. The restriction of this patent, along with the widespread public delight about the daguerreotype, was blamed for slowing further development of photography on paper during the 1840s. Frederick Scott Archer's introduction of photography on glass in 1851 was the first serious commercial challenge to the daguerreotype and was quickly taken up by photographers in England. Talbot believed that the basic concept of Archer's process differed little from his calotype process. In 1852, at the urging of the Royal Society and the Royal Society of Arts, Talbot relinquished his patent rights for all amateurs, scientists and artists with the exception of commercial portraiture, which he felt he had to retain to protect the business of those who had already taken out a license from him.

In 1854, Talbot brought suit against a photographer named Martin Laroche (real name William Henry Sylvester) claiming that Laroche's use of the collodion process violated his patent rights. Although Talbot had the support of Sir John Herschel and Sir David Brewster, the judgment assigned Talbot credit as the inventor of the photographic process on paper, but ruled that Archer's process was outside his patent and was therefore available for public use.

Photoengraving

Talbot's desire to create images that were both reproducible and permanent was not to be found in silver printing processes. Talbot made his last photograph in 1846. His mother's death in 1846 and his prolonged illness throughout the late 1840s brought an end to his experiments using the calotype process. Although Talbot's experiments with photography ended in 1845, in the early 1850s he picked up his earlier researches on printing photographs by way of a printing plate and ink. By 1852 he had created his first successful photoengraving process, which he patented. Later changes brought about a greatly improved process, which he called Photoglyphic engraving, taking out a patent on it in 1858. These two photographic engraving processes were the foundation for photogravure printing.

Talbot's Later Years

From the mid 1850s until his death in 1877, Talbot turned much of his intellectual energy to deciphering Assyrian cuneiform tablets held by the British Museum. Along with Sir Henry Rawlinson and George Smith of the British Museum, Talbot was one of the major translators of this previously unintelligible script.

In 1863, Talbot was awarded an honourary Doctor of Laws degree from Edinburgh University for his "pre-eminence in literature and science, and the benefits that his discoveries have conferred on society.

Talbot died in his study at Lacock Abbey on the 17th September 1877 and was buried in the cemetery at Lacock. His entire estate, including all of his photographs and scientific notebooks, were left to his son Charles Henry. When Charles died in 1916 he left everything to his niece Matilda Gilchrist Clark who then changed her name to Talbot. She was a great promoter of her grandfather's work and it was through her that large collections of his work were lodged with the Science Museum (now at the National Museum of Photography, Film and Television) and the Royal Photographic Society with smaller collections given to the Smithsonian. In 1944, Matilda donated Lacock Abbey and its estates to the National Trust. The contents of the house, including his photographs and papers remained with the family and are now in the William Henry Fox Talbot Trust collection.

Although usually referred to as Fox Talbot in both contemporary and modern texts, he preferred Talbot and usually signed himself Henry F Talbot or HF Talbot. The use of H Fox Talbot Esq. on the title page of *Pencil of Nature* is probably the origin of this use of the family name.

In addition to a number of published articles and pamphlets on mathematics and other subjects, Talbot also published seven books: *Legendary Tales in Verse and Prose* (1830); *Hermes or Classical and Antiquarian Researches* (vol. 1 1838, vol. 2 1839); *The Antiquity of the Book of Genesis—Illustrated by Some New Arguments* (1839); *The Pencil of Nature* (published in fascicles from June 1844 to April 1846); *Sun Pictures in Scotland* (1845); *English Etymologies* (1847).

ROGER WATSON

See also: Archer, Frederick Scott; Brewster, Sir

David; Daguerre, Louis-Jacques-Mandé; Faraday, Michael; Herschel, Sir John Frederick William; Wedgwood, Thomas; Royal Photographic Society; Societies, groups, institutions, and exhibitions in the UK; Illustrated Books illustrated with photographs: 1840s; Books and manuals about photography: 1840s; Great Britain; Developing; Exposure; Fixing, Processing and Washing; Latent Image; Light-Sensitive Chemicals; Paper and Photographic Paper; Calotype and Talbotype; Photogenic Drawing Negative; Wet Collodion Negative; Daguerreotype; Salted Paper Print; Camera design: 1. 1830s–1840s; Court Cases and Photography; History: 1. Antecedents and proto-photography up to 1826; History: 2. 1826–1839; History: 3. 1840s; History: 4. 1850s; Patents; Laroche, Martin; and Wollaston, William Hyde.

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TAUNT, HENRY WILLIAM (1842–1922)

Henry Taunt was born in Oxford, and at the age of 14 was apprenticed to portrait photographer Edward Bracher. When Bracher sold the business in 1863, the new owners retained Taunt as manager, but four years later he left to establish his own studio.

One of his first publishing ventures in the late 1860s was the first photographically illustrated guide to the River Thames—later to be followed by over fifty other publications. The second edition of his *New Map of the River Thames*, published in 1873, was illustrated with eighty original photographs and hand tipped onto the pages. Talented at self-promotion, he generated demand for his work by giving lantern-slide lectures throughout the area.

Using wet collodion during the early years of his career, he is reputed to have carried all his equipment, materials, and darktent on a small boat as he explored the river.

In addition to illustrated books, Taunt & Co. published many albums of views of the Thames and the surrounding areas.

Taunt was politically active throughout much of his career, and in 1880 became involved in a campaign to improve Oxford's water supply, at a time when it was reportedly possible for live shrimp to be delivered through the cold water tap. He participated in this cause by threatening to photograph the shrimp and publish the images.

JOHN HANNAVY

TAUPENOT, JEAN MARIE (1822–1856)

Originally from Givry, in Burgundy, Jean Marie Taupenot was born the 15th August 1822. He studied physics and biology. His work about Montpellier and the Cevennes's geology (south of France) gave him the doctor graduate in natural science in 1850.

He became professor of physics, first in Romans (in the south of France), then in Chaumont (in the Champagne area).

Eventually, he was named professor of physics and chemistry in the military high school of La Flèche, the Prytanée Impérial Militaire in 1853. There began his interest in photography: he setted up in this school the laboratory where he worked the next three years.

He invented and revealed to the Société française de photographie a dry collodion process in 1855, to which he gave his name. At this time, he became involved in this society.

The same year he presented to the French Academy of Sciences a little photographic device called "chercheur photographique" or a photographic view finder.

After his wedding in 1856, he carried on his researches in geology and natural sciences, inventing a wind gauge.

Jean Marie Taupenot died the same year, at the age of thirty-two, the 15th October, in La Flèche.

Jean Marie Taupenot was not a professional photographer, he was a scientist involved in photography by passion.

The photographic process invented by Taupenot gave to the unknown professor a world-wide acknowledgement. At this time, the best photographic technique was the Wet-plate or collodion process, an invention of several persons, especially Frederick Scott Archer, an English photographer, and Gustave Le Gray, in 1851. The negative was on a glass plate coated with collogion, a mixture of guncotton and ether. It was quite fast (only a few seconds to pose), but all the process had to be fulfilled before the complete drying of the glass plate. Practical for photographic studios, it was very complex to take photographs outside.

For this kind of photographs, another useful process was the negative albumen process proposed by Niepce de Saint-Victor in 1847. The glass plate was coated with iodide and bromide of potassium.

Jean Marie Taupenot used to employ both processes, wet collodion and albumen, but "he was impatient of the slowness of the albumin and perhaps more of the defect of solidity of collodion" ("il était impatienté des

lenteurs de l'albumine et plus encore peut-être du défaut de solidité du collodion," extract from the *Bulletin de la Société française de photographie,* 1855, 234). The unique solution the photographer had found, was to put varnish on the negative plate poured with wet collodion to give them stability. However, this result was expensive and not easy for people who were living in the countryside as was Taupenot (la Flèche is about 300 km far from Paris).

That is the reason that he had the idea to combine both techniques. As the main principle, he substituted the varnish with albumen, a nitrogenous substance found in egg white, making it less costly and easier to obtain.

As an amateur photographer, Taupenot's research was a great help to other photographers. He did not patent his process, making it freely available to all, but he was aware of its importance. He created an album of photographs that he presented and offered to the emperor Napoleon the Third, who decided to add his pictures to the Exposition Universelle in Paris the same year. The scientist even won a bronze medal for his work.

In this album, the photographs presented the procession of the Fête-Dieu (in June), in the Prytanée: the students in the gymnasium, the chapel of the School, the Library, the Laboratory, the garden and the park. As a matter of fact, he had to prove that his process could be used inside as well as outdoor.

A professional chemist and physician, he was looking for the acknowledgement of his colleagues: that is the reason he presented his discovery to the French Academy of Sciences. One of the most important scientists of this time, Michel Eugène Chevreul (1786–1889), made the report about it.

At the same time, he described his process before the members of the Société française de photographie, in September 1855. He brought with him several samples of photographs made with his technique in order to show the good quality of images he obtained. A commission constituted of MM. Bayle-Mouillard, Bayard, Humbert de Molard, Fortier and Fierlants, was gathered to test the invention.

The Taupenot process consisted of a classical collodion preparation sensitized with iodide of ammonium, to which he added a mix of fermented albumen, honey, iodide of potassium, and water with brewer's yeast.

Taupenot coated the glass with the collodion, as the photographer used to do, and he washed it with water. Then he poured the collodion glass with the albumen and drained it off until the albumin was dry. To sensitize the plates and use them, the photographers had to put them in a bath of aceto-nitrate as used for the classical albumen process. The scientist used the gallic acid, a classic modus operandi in the 1850s, to reveal his negatives.

With this process, the glasses could be exposed more than one month after their preparation.

The most important problem with the collodio-albumen technique was the exposure. It required a longer time exposure than the collodion-based one (sometimes eight times more). The photographs he showed at the French Photographic Society were obtained with an exposure time between six seconds and one minute, making this technique perfectly suitable for representing still life, landscapes and architectures, but not fast enough to be used for portraits. The quality of the photographs was as subtle and delicate as with the albumen process.

The notice of this discovery was spread all over the world, relayed by the newspapers specialized in photography and the photographic societies. This process has been used by many photographers particularly from Austria, the French Louis Alphonse Davanne and Alphonse François Jeanrenaud, among others. Several names were given to the Taupenot's technique: collodio-albumen process, dry plate process, Taupenot process, albumenised collodion.

The apex of the Taupenot process was between the middle of the 1850s and the 1870s. By these times, different people were looking for a better technique than the wet collodion process and tried to dry the coated mix. Such attempts include Fothergill's process invented in 1856, the tannin process of Major Russel in 1861, and Bolton & Sayce's process, which added silver-bromide to collodion. However, Taupenot's walked away the support of the amateur photographers.

In the same spirit of this first invention, the simplification of the photographic technique, Jean Marie Taupenot also presented to the French photographic society, in January 1856, a little device everyone could realize, that he named "chercheur" (researcher). It looked like a small cork tube pierced with a round hole at one extremity and a square hole at the other extremity. This last hole should have the same ratio as the negative glass. In fact, it had the same purpose that the "iconometer": finding the best position to give to the camera.

Taupenot's photographs were not particularly worthy for their aesthetics: he was an amateur and his practice was mostly a validation of his chemistry research on photography. Unlike other chemists, he never advertised his work by publishing books, and these pictures are the sole testimony of his studies. They are conserved in the Bibliothèque Nationale de France and the French Photographic Society.

Marion Perceval

See also: Wet Collodion Negative; Archer, Frederick Scott; Le Gray, Gustave; Niépce de Saint-Victor, Claude Félix Abel; Chevreul, Michel-Eugène; Bayard, Hippolyte; Humbert de Molard, Baron Louis-Adolphe; Krone, Hermann; Davanne, Louis-Alphonse; Expositions Universelle, Paris (1854, 1855, 1867 etc.) and Sayce, B.J.

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TAYLOR, A. & G.
Company

Andrew and George Taylor founded a highly successful string of photographic studios which capitalized upon the 1860s craze for collecting and commissioning portrait photographs. They were previously engaged in the production of miniatures and like many others in this trade they made the transition to photography. Their first photographic studio was opened in London around 1864 with an address at 11 Cannon Street West. They were soon to establish branches outside London and numbered the following locations among their outlets: Birmingham, Carnarvon, Glasgow, Leeds, Liverpool, Manchester, Newcastle and Dublin. They also opened further studios in America including New York, Boston, Pittsburgh, Philadelphia, Chicago, and Newark. A Paris studio was opened some time after 1879. In adevertisements and upon the reverse of photographs they regularly claimed to be the 'Largest Photographers in the World.'

In 1882, a detailed account of their central operations at Forest Hill, London was given by H. Baden Pritchard in his publication entitled *The Photographic Studios of Europe*. Here a large number of staff, many of them female, were engaged in processing and printing the images which were sent to London from the firm's branches throughout England. The account took the form of a guided tour given by the works manager, Mr Smith. This factory demonstrated a strict division of labour with entire floors of the immense building being designated to particular tasks, for example, the Enlarging Room. Daily targets were set for the employees who worked on assembly lines. Taylor's success may have stemmed from their centralized approach to production which utilized high quality equipment such as lenses by Dallmeyer. In Dublin they were the first photographic studio to establish an instalment method of paying for photographic portraits. It is probably through the introduction of such shrewd business methods that they were able to sustain successful studios in a multitude of locations.

It is also thought that the basis of the company's success was the sale of many copies of a carte-de-visite of Queen Victoria and Princess Alexandra. The publication in 1860 of a set of royal portraits started a fashion in Britain for collecting carte-de-visite portraits of famous people. Though the validity of Taylor's claim to royal patronage may be in question as the company lost a court case in 1884 for illegally representing themselves as photographers to the Queen, which was a matter widely reported in the photographic press of the time. Like other portrait studios they utilized the verso of carte-de-visites and cabinet portraits to name royal customers and to boast of medals awarded at the many international exhibitions which took place during this period. Taylor's exhibited at numerous exhibitions including the Edinburgh Photographic Society's show of 1890.

The firm was also engaged in the production of photographic furniture. This consisted of the many studios props that appeared in the background of carte-de-visites and cabinet cards. Their advertisements offered items such as posing chairs, ornate cabinets and head rests. The need for such a service was indicative of the increased popularity of the studio portrait. It also explains the sameness that was found in studio portraits of the era, where every sitter appeared in a refined middle-class setting. There was also evidence that they were involved in the production of postcards from 1901. Their premises at Hastings was used for this purpose from 1914 onwards where processes such as the Collotype, Albertype and the 'Lichtdruck' which was a variation on the Woodburytype**,** were employed.

During the period between July and October 1869 Andrew left the firm. However he is listed as the manager of the Head Office in Regent Street, London, in the 1880s. Throughout this period they employed a network of managers and the whole business seems to have been run somewhat on a franchise basis. Although George Taylor died in 1911, branches were to continue in business for many years afterwards.

ORLA FITZPATRICK

See also: Dallmeyer, John Henry & Thomas Ross; Cartes-de-Visite; Collotype; and Woodburytype, Woodburygravure.

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TAYLOR, JOHN TRAILL (c. 1827–1895)

John Traill Taylor, born in Scotland's Orkney Islands, and the son of a watchmaker, went on to become one of the most influential figures in the emerging photographic press in Great Britain.

Moving to Edinburgh c.1845, initially working as an optician and watchmaker, he is believed to have written for several daily newspapers, and to have contributed to a number of scientific and optical journals.

In 1856 he founded a manuscript journal entitled *The Photographer* and three years later began his long association with *The Photographic Journal*, formerly the *Liverpool & Manchester Photographic Journal*. This became *The British Journal of Photography* (*BJP*) in 1860 and which he edited from 1864 until 1879, and again from 1886 until his death in 1895, also editing *The British Journal of Photography Almanac* during that latter period.

Taylor's interest in the practice of photography had started with the daguerreotype in the 1840s and continued throughout his life. He regularly communicated with William Henry Fox Talbot in the 1860s both on scientific issues, and in preparing an account of Talbot's life and work for the *BJP*. He resigned his editorship in 1879 intending to take up photography professionally, but by 1880 he had moved to the United States where he spent five years as Editor of *The Photographic Times*.

His influential writings on photography were reprinted in several journals in both Britain and America. Having purchased land in Florida planning to live there in his retirement, he died there suddenly in November 1895.

John Hannavy

TENISON, CAPTAIN EDWARD KING (1805–1878)

Irish

Tenison was a wealthy Irish landowner who was an early pioneer of the calotype and waxed-paper negative. He married the eldest daughter of the 1st Earl of Lichfield, Lady Louisa Anson, in 1838 and lived at Kilronan Castle, Roscommon. Tenison and his wife travelled to France and Spain in the early 1850s and in her 1853 journal *In Castile and Andalucia* Lady Louisa gives a humorous account of the interest her husband's suspicious 'Talbotype Apparatus' aroused amongst the locals.

Tenison exhibited various studies at the 1853 Dublin exhibition and joined the newly formed Dublin Photographic Society the following year. He showed four Spanish architectural studies from waxed-paper negatives in the 1854 Photographic Society's London exhibition and in 1855 ten views of chateaux, priories and churches in Normandy. His large Spanish pictures were generally well received at the Dublin exhibition, the Photography Section Report jurors remarking on the prints' unusual warm-yellow and violet tints (from gold-toning), however it was suggested that they had too much contrast and could perhaps be improved by printing with the Blanquart-Evrard process. Tenison seems to have taken this advice on board and many of his later French views were produced by the French process.

Ian Sumner

TERRIS, ADOLPHE (1820–1900)

French photographer

Adolphe Terris is best known for his photographs of the large-scale public construction projects that occurred in and around Marseilles, France in the early 1860s. Terris was born in 1820 in Aix-en-Provence to a family of craftsmen. Terris' first known commercial venture was a book store, which he opened in Marseilles in 1845. His interest soon turned to photography, however, and by 1856 he was working in a local photography studio in the port city. Terris was a founding member of the Société Marseillaise de Photographie in 1860, and in 1861 he had organized a photographic exhibition in his studio. In 1861 Terris also received his first commission to photograph the large civil engineering projects underway in and around Marseilles, on this occasion his subject was the extensive renovation of the Rue l'Imperiale. Between 1861 and 1875 the city commissioned Terris to document other aspects of their construction and modernization program, including the rehabilitation of the public roads and buildings, the harbor and waterfront. Terris' photographs serve as an important historical record of the transformation of the city of Marseilles. Several of his photographs were included in *Les Travaux Publics de la France*, which was published through the French Ministry of Public Works. Terris died in 1900.

Maxim Weintraub

TEYNARD, FÉLIX (1817–1892)

French, active in Egypt 1851–1852, photographer, civil engineer

Félix Teynard, a provincial civil engineer, completed an extensive photographic survey of Egypt during the course of a Nile voyage beginning in late 1851 and concluding in 1852. Working with the calotype process, Teynard made more than 160 paper negatives along the Nile from Cairo to the level of the Second Cataract. He completed what to date was the most thorough documentation of the recently cleared site of Abu Simbel, as well as extensive and systematic records of Karnak, Luxor, and Philae. Publication of Teynard's work began in 1853

Terris, Adolphe. Rues des Grands Carmes, Marselles.
The Metropolitan Museum of Art, Purchase, The Horace W. Goldsmith Foundation Gift, 1995 (1995.171) Image © The Metropolitan Museum of Art.

and culminated in 1858 with the two volume *Egypte et Nubie* containing 160 photographs. It is considered one of the masterworks of early travel photography. However, Teynard's project was not the first sustained photographic record of Egypt, nor was it the first lavish photographic publication based on the ruins along the Nile. Maxime DuCamp, traveling with Gustave Flaubert, had photographed along the same route in 1849–51. It was DuCamp's photographs, brought out by Gide et Baudry in 1852, that received attention and accolades as the first and extensive photographic record of the sites of ancient Egypt and the first photographically illustrated travel book. In January 1853, before Goupil began printing Teynard's photographs for distribution, DuCamp received the Legion of Honor in recognition of his photographic work.

Teynard's photographs epitomize the tensions inherent in early expeditionary photography: on the one hand, the acceptance of photography as the newest tool in the long effort to create accurate visual records of the world, the latest technological innovation in the long tradition of drawn and printed topographic views; and, on the other, a growing appreciation of the photograph's unique ability to capture and convey the sense of a place as experienced at the moment the photograph was made. In short, the tension between neutral record and the evocation of experience. Teynard's project must be seen as part of the drive to apply the new technology of photography to record the physical world, in this case the sites of ancient Egypt. From this perspective, photography, rather than a radical break with the past, was part of the continuum of strategies in the ongoing project to replicate and reproduce for publication views of the world, a project which began with the printing revolution of early modern Europe. Teynard embraced this view of photography as a complimentary technique to earlier modes of recording when identified his project in the subtitle of *Egypte et Nubie*, as a "photographic atlas complementing the great *Description de l' Egypte*"—the massive multi-volume publication of

Napoleon's scholars. Yet he recognized the inherent difference in mediums—the engraved illustration as an idealized summation of multiple sketches and measurements versus the photograph as carrying the impress of the physicality of a place at a specific moment. He offered his photographs to his readers as the "records of his sensations" as he experienced the ancient sites of Egypt.

Both formally and intellectually, Teynard's work is connected to pre-photographic projects to order and record ancient Egypt. His work rests squarely on French scholarship begun by the cadre of scholars who accompanied Napoleon's Army of the Nile in 1798. The *Description de l'Egypte,* which included ten volumes of highly detailed engravings based on sketches and measurements made by the over 100 scholars and engineers, was the summation of the work of Napoleon's scholars. It offered an encyclopedic treatment of Egypt and became the foundational text in the developing discipline of Egyptology. Teynard's engagement with the *Description* was not perfunctory. His approach to complex sites such as Karnak and Philae was modeled on that in the *Description*. He provided site plans upon which he indicated camera positions and angles. Captions of photographs related the images to the site plan. Where possible, he photographed structures from vantage points that replicated the illustration in *Description*. Napoleon's teams of scholars had not ascended the Nile into Nubia; there he turned to Gau's *Antiquités de la Nubie*, published in 1822 and conceived by the author as the continuation of the work of the earlier scholars. Again, Teynard photographed, almost exclusively, the structures and sites illustrated by Gau, choosing vantage points which yielded views which corresponded to Gau's illustrations. While Teynard's debt to earlier models can be seen in choice of subjects and viewpoints, the startling immediacy of photographs made in the shadowed recesses of colonnades and across the desolate sweep of desert reinforce his description of the photographs as the record of sensations. The tension between positivist record and romantic experience distinguishes his work from that of others practicing in Egypt at the time.

After his return, Teynard's photographic activity was confined to scientific and technical experimentation. In 1862, he submitted the winning solution to the problem posed by the Academie des Sciences for the Prix Bordin, a problem on optical focus. He continued to investigate the focusing properties of lens and submitted work to the Academy. In 1869 he was among the invited guests of the Khedive at the opening of the Suez Canal. He died outside of Grenoble in 1892.

The publication history of Teynard's photographs is complicated. His work was first issued as *Voyage en Egypte et en Nubie: Sites, Monuments, Bords du Nil* in thirty-two livraisons of five prints beginning in 1853 by Maison Goupil et Compaigne, Paris. It was only in 1858 that the complete book was published by Goupil et Cie in two volumes under the title *Egypte et Nubie: Sites et Monuments les plus interessants pour l'etude de l'art et de l'histoire*. The 160 prints were accompanied by his short descriptive texts. The two volume set commanded a very steep price, 1000 Francs. The size of the edition is unknown but fewer than 15 complete copies of the two volume work are known to exist.

KATHLEEN STEWART HOWE

See also: Calotype and Talbotype; Du Camp, Maxime; and Goupil & Cie.

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THOMAS, JOHN (1838–1905)

Born Glan-Rhyd, Cellan, West Wales, John Thomas left his draper's assistant post in Lampeter in 1853 and walked to Liverpool to start a similar post. Ill health prompted an outside job and he became a 'Town Agent on Commission' for a firm trading in stationary and photographs of famous personalities along the North Wales route, from Liverpool to Holyhead. It was the absence of any Welsh personalities that prompted him to take up photography in 1863. He became the manager for Harry Emmens Studio in Liverpool, photographing mainly non-conformist ministers. In 1867 he launched his own business, producing *carte-de-visites*, also *-in memoriam*, under such titles as bards, poets, musicians, singers, missionaries, church dignitaries and ministers. While he spent most of his time tramping round North Wales his wife ran the mail-order business from the Cambrian Gallery, Liverpool, which lasted for around 40 years. Before his death, he selected 3113 plate negatives which were bought by Sir O. M. Edwards who used them to illustrate articles in his *Cymru* magazine. This collection is now in the National Library of Wales. Along with his depictions of tradesmen, working women, town characters, the almshouses, farm yard and market streets, the coming of the railways, building the reservoirs, he accomplished the most important depiction of life in 19th century Wales, and one of the earliest sustained documentary projects in the history of photography.

ALISTAIR CRAWFORD

THOMPSON, CHARLES THURSTON (1816–1868)

British photographer, official photographer to the South Kensington Museum and Department of Science and Art

Charles Thurston Thompson was born in 1816, the son of a wood engraver, John Thompson. Charles took up his father's profession under his tuition. With his father he drew and engraved many of the illustrations for William Yarrell's *A History of British Birds* (1843). In his early thirties he turned to photography and began practising the wet collodion technique around the time it was introduced in 1851. The same year, Thompson assisted Henry Cole, civil servant and Chairman of the Fine Arts Committee of the Society of Arts, with the arrangements for photography at the Great Exhibition in London. Thompson worked with the photographer Robert Bingham on the production of the photographic prints for the *Reports by the Juries of the Great Exhibition* (1851) and in 1852 worked with him in his studio in Paris.

Out of the proceeds of the Great Exhibition and with government help, land was purchased in the area south of Hyde Park, for the establishment of the new South Kensington Museum (later renamed the Victoria and Albert Museum). Henry Cole, later to become Thompson's brother-in law, was appointed first director. The Museum officers were keenly aware of the possibilities that photography could play in the development and promotion of museum activities and collections. Thompson was called upon by the Museum as a freelancer to produce photographs of objects on loan to an exhibition of decorative furniture held at the Museum's temporary accommodation at Gore House in 1853. In the gardens he photographed the *Venetian Mirror c.1700 from the Collection of John Webb* (1853, V&A collection), along with other studies of mirrors, showing himself reflected in the glass. Usually, such photographs had the mirror glass obscured during exposure or blacked out in the printing to remove the reflection. Thompson's images of mirrors reveal the processes of early object photography and suggest that he was consciously showing himself at work in the new-founded profession of Museum photographer.

In 1855 Thompson was appointed superintendent of the British photographic contributions to the Paris Exposition Universelle and travelled there to work with Bingham on photographing the exhibition and its buildings. While there he was granted special permission by the French government to photograph art objects in the Louvre. On his return to London in 1856 Thompson submitted works for the exhibition of the Photographic Society of London. That same year he was appointed official photographer to the South Kensington Museum and the Department of Science and Art thus establishing the earliest Museum photographic service in the world. Thompson photographed not only Museum objects but also made pictures of the construction of the new museum. Non-commissioned military officers of the Royal Engineers, or 'sappers,' contributed to many aspects of the Museum's operations and were enlisted to assist Thompson in photography as they had done previously during the Great Exhibition. Thompson was formally appointed by the War Department to teach photography to the Royal Engineers in 1856 for which he was paid ten guineas when each soldier was granted a certificate of proficiency. Their photographic skills were subsequently of great use to the military in documenting terrain in many corners of the world and in reproducing Ordnance Survey maps.

On the completion of its main buildings the Museum re-opened at South Kensington in 1857 and Thompson's studio was set up at the site. In July he returned to Paris to purchase a lens suitable for photographing the sizeable Raphael Cartoons then housed at Hampton Court Palace prior to their removal and display at the Museum. A special camera was constructed to accommodate large glass negatives measuring 30 × 48 inches (76 × 122 cm). Only full daylight was sufficient to obtain the correct exposure so a method of photographing the fragile works on paper in the outdoors was devised: they would be hung out of the windows at the Palace on fine days. This work continued throughout 1858. The prints were offered for sale to the public but they also proved useful to the Museum staff who marked the prints with diagrams to identify areas of the original cartoons requiring treatment—possibly the first use of photography for conservation purposes. The negatives and marked prints remain in the V&A collection.

The same year Thompson photographed the Exhibition of the Photographic Society of London and the Société française de photographie held at the South Kensington Museum (V&A collection). This image is an important record of the appearance of early photographic exhibitions with stereoscopes on tables and pictures hung floor to ceiling, frame to frame. A figure seated is likely to be Thompson himself. Three of his works, tree studies made in Surrey probably taken in 1857 or 1858, are visible in the exhibition. His systematic representation of trees was intended to be of use to the Museum in its capacity as a source of inspiration for artists and designers. They served as studies from which students could copy, much like Edward Fox's *Anatomy of Foliage* acquired by the Museum for the same purpose in 1865. Thompson's tree studies survive, along with many of his other works, pasted into the Museum's 'guard books'—bound volumes containing one print from every negative made for the Museum photographic service (V&A Archive).

In April 1859 Thompson became a full employee of the Museum on a retainer of an annual fee of one hundred pounds. Although obliged to be at the call of the Museum, he was not prohibited from engaging in private work. Partly in order to keep up with demand, he concentrated on making negatives only at the Museum. In addition to his retainer he received 3d for every square inch of negative. A further reason for Thompson's concentration on making negatives only was as a reaction to a debate brewing between the Museum and the private trade. Objections were raised that the Museum was undercutting the general trader by selling exclusive reproductions of works of art that were financed by public funds. Furthermore, because of Thompson's official employment, private photographers were discouraged from working in the Museum. The issue of safety to Museum objects complicated the issue. At the British Museum, where Roger Fenton had worked as a freelancer, an accidental fire caused by another photographer had led the trustees to prohibit anyone but the photographer approved by them to work on the premises. This, and the fact of the existence of an established negative store and printing establishment at South Kensington, led to the British Museum's arrangement with Fenton being discontinued and all photography for both Museums being transferred to South Kensington.

A Select Committee of the House of Commons was set up to enquire on the issues. The minutes of evidence published with the Committee's report in 1860 give a fascinating insight through photographers' testimonies. It was decided that the appointment of an individual or firm to the Museum was necessary for the smooth running of a Museum photographic department. However, A Committee on Education passed a minute on 10 January 1862 stating that photographs from negatives produced from objects of art being public property should be sold through channels of trade.

Thompson was industrious photographing a huge variety of objects at the Museum. It is estimated that he produced in the region of 10,000 negatives. A *Price List of Mounted Photographs printed from negatives taken for the Science and Art Department by the Official Photographer C. Thurston Thompson* (London: Chapman and Hall) dated 1864, lists nearly one thousand different photographs. These include categories such as Italian sculpture, arms and armour, engraved ornament, cartoons and drawings of Raphael, portraits by Holbein in the Royal Collection at Windsor Castle, Limoge enamels, ivory carvings, objects in crystal in the Louvre, Turner's *Liber Studiorum*, and trees studies. Prints could be obtained through the photographic firms of Chapman & Hall, P. & D. Colnaghi, Scott and Co. and Cundall, Downes & Co. The public could also request images to be made of objects in the Museum not already photographed.

In 1866, Thompson left on a tour of Spain and Portugal to photograph works of art and architecture. John Charles Robinson, curator of the South Kensington Museum, had visited the Cathedral of Santiago de Compostella in Spain the year before. He singled out the cathedral's Romanesque doorway, the Portico de la Gloria, for special treatment commissioning a gigantic plaster cast of the whole structure to be shipped to the Museum. He also asked for Thompson to photograph the site, so that the photographs could be shown alongside the plaster cast, showing the context of the doorway. Robinson left precise instructions for Thompson down to placing the camera 'betwixt the 9th and 10th trees at the roadside.' However, Thompson went beyond his brief, photographing the crypt, and the tribune above the Portico de la Gloria and views of the Puerta de las Platerias. In 1868 the Arundel Society published a volume of the photographs that brought the hitherto largely unknown cathedral to the attention of scholars and played a central role in raising interest in Spanish antiquities in the later 19th century. His photographs of Portugal were exhibited in the Portuguese section of the Universal Exhibition of Paris, 1867 and the Arundel Society published, *The Sculpted Ornament of the Monastery of Batalha*, 1868.

Thompson was described as "a man of extensive and varied art culture, possessing a most discriminate taste and judgement; but, withal, modest and unassuming. As a private friend he was a rarely amiable man, possessing and unusually winning and conciliatory deportment" (*The Photographic News*, Vol. XII, no.490, 24 January 1868, 38.). Late in 1867 he stayed in Paris to assist with the photographic section of the British portion of the exhibition. While there he suffered severe attacks of jaundice and died on 20 January 1868 aged fifty-two.

MARTIN BARNES

Biography

Charles Thurston Thompson was born in 1816 and trained with his father as a wood engraver. In his early thirties he turned to photography and began practising the wet collodion technique around 1851. The same year, Thompson assisted with the arrangements for photography at the Great Exhibition in London. He worked with the photographer Robert Bingham on the production of the photographic prints for the *Reports by the Juries of the Great Exhibition* (1851) and in 1852 worked with him in his studio in Paris. On returning to London in 1853 Thompson was employed by the newly founded South Kensington Museum (later renamed the Victoria and Albert Museum) first as a freelancer and from 1859 as official photographer, the first post of its kind. He made thousands of negatives of objects in the Museum and of artworks in other public and private col-

lections including the Royal Collection and the Louvre. Thompson was an active organiser and exhibitor of the Photographic Society throughout the 1850s and early 1860s. In 1866, at the direction of the Museum, Thompson left on a tour of Portugal and Spain and produced fine architectural photographs, among them views of the Cathedral of Santiago de Compostella, Spain. Late in 1867 he stayed in Paris to assist with the photographic section of the international exhibition. While there he suffered severe attacks of jaundice and died on 20 January 1868 aged fifty-two.

See also: Wet Collodion Negative; Cole, Sir Henry; Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); South Kensington Museums.

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THOMS, WILLIAM JOHN (1803–1885)

The writer William John Thoms was born in Westminster, London, and initially trained as a clerk, working for over twenty years at Chelsea Hospital before moving to the House of Lords as Clerk around 1845. He eventually held the post of Deputy Librarian there from 1863 until his retirement.

In addition to his clerical posts, Thoms was a prolific writer, and in 1849, founded the subsequently influential journal *Notes & Queries*. The journal first carried an essay on photography in September 1852, and in the following issue, Thoms explained his decision to include the new art:

> The shadow of a doubt that we once felt as to the propriety of introducing the subject of Photography into our columns, has been entirely removed by the many expressions of satisfaction at our having done so which have reached us.

and thus embarked on an engagement with the medium which continued for many years. Amongst his early contributors were Dr Hugh Diamond, who would later edit the *Journal; of the Photographic Society* and George Shadbolt, later editor of *The Liverpool & Manchester Photographic Journal.* Thoms, himself a keen amateur photographer, continued to edit *Notes & Queries* until 1872.

In the wider world of literature he is remembered for his 1879 book *The Longevity of Man: Its facts and Its Fictions* (London: F Northgate) and for the invention of the word 'folklore' in 1846.

JOHN HANNAVY

THOMSON, JOHN (1837–1921)

John Thomson was born in Edinburgh in 1837. While little is known of his early years, the intellectual breadth of his writings suggests that Thomson was well educated. He was a versatile photographer whose work ranged from portraiture, landscape and architecture to studies of urban life. Thomson was a keen observer of his various subjects, a skill that led him well beyond the conventions of travel photography.

Thomson traveled to Asia in 1862, at the age of twenty-five, settling first on the island of Penang in Malaysia. With brief interruptions, Thomson lived in Asia for the next decade, photographing in Siam, Viet Nam, Cambodia, Formosa, and vast stretches of China. It is difficult to overstate the challenges that Thomson confronted during his travels in Asia. Traveling with the paraphernalia involved in the wet collodion process was arduous, what with the weight and fragility of the cameras, lenses, glass plates, chemicals, trays, and material sufficient to make portable darkrooms. He transported himself and his equipment to high mountain ranges, jungles, swamps, and the upper reaches of the Yangtze River. But just as formidable were the challenges of negotiating different languages and cultures. Thomson must have been a man of considerable charm and persuasion, since he repetitively connected with powerful, well-placed people in these countries who sat for his portraits and then enabled him to gain access to other people and remote areas. The King of Siam, for example, provided support for Thomson to photograph, for the first time, the extraordinary ruins at Angkor Wat.

Thomson was not immune from ethnocentrism and cultural bias in his images and writing, but in the main he expressed a genuine respect for native customs, and he took evident pleasure in explaining these differences to his European readers. When traveling, Thomson took extensive notes which he later used for the essays he published along side his photographs, in which he explained in considerable detail a wide range of local customs. On occasion he made pointed comments about how Europeans could learn could learn from the comparisons. When writing about Cantonese merchants, for

Thomson, John. A Young Prince. *The Metropolitan Museum of Art, Gilman Collection, Purchase, Cynthia Hazen Polsky Gift, 2005 [2005.100.583 (33b)] Image © The Metropolitan Museum of Art.*

example, Thomson suggested that, "Here we find none of the display, none of those desperate efforts to secure the lion's share of custom, which competition has fostered in European towns." Thomson photographed and wrote about the full spectrum of society from Kings, politicians, and traders to peasants, street people, beggars, and even criminals. To appreciate the achievement of Thomson's Asian work, we should bear in mind that most of the people who posed for him had never seen any picture of themselves, much less a European who brought with him this odd collection of equipment that somehow produced miraculous images. Thomson clearly had the ability to put people at ease and gain their trust, which in turn allowed him to convey a sense of unforced naturalness in his portraits.

Thomson also made outstanding photographs of the various terrains that he traveled in Southeast Asia and China. His photographs of mountains, for example, compare favorably to the Bisson Frere's studies of the Alps and Samuel Bourne's images of the Himalayas, and he was no less successful in photographing jungles, farmlands, rivers, and seacoasts. He also made accomplished architectural photographs of pagodas, houses, temples, and other structures. Like many great photographers, Thomson's visual versatility allowed him to find unique solutions to challenging subject matter.

When Thomson married his wife, Isobel, in 1868, they settled in Hong Kong. When she returned to England after the birth of their son, Thomson continued photographing in Asia, but he finally returned to England for good in 1872. He published four volumes on his travels in China entitled *Illustrations of China and its People* (1872–74). These ambitious books contained over two hundred photographs, which were published along side his detailed and entertaining commentaries. In 1875 he published a lengthy memoir of his travels in Asia, *The Straits of Malacca, Indo-China and China,* which were illustrated with engravings based on his photographs. Taken together, these books comprise the most complete photographic and ethnographic record of China and Southeast Asia made during the 19th century.

Thomson applied the skills he had honed in Asia to his native culture when he began photographing street people of London. The resulting book, *Street Life of*

London (1877), combined his Woodburytypes with detailed essays on the images. His collaborator, Adolphe Smith, wrote most of the texts, although Thomson wrote some of them, and in all likelihood they collaborated on many of the rest. The authors stated their intentions in the Preface:

> we have sought to portray [the] harder phases of life of bringing to bear the precision of photograph in illustration of our subject. The unquestionable accuracy of this testimony will enable us to present true types of the London Poor and shield us from the accusation of either underrating or exaggerating individual peculiarities of appearance.

Street Life of London represents a major breakthrough in street photography, which until that time had been a minor sub-genre of photography. While photographers like Charles Marvill, Charles Negre, and Henry Mayhew had occasionally ventured into the streets, the bulkiness of the cameras and slow exposure speeds were obstacles. But the obstacles extended considerably beyond technical limitations: with few exceptions, art and literature before the mid-nineteenth century seldom dealt with the common man, much less the impoverished or the homeless. However, a combination of political, intellectual, and cultural factors had developed since the late eighteenth century that led writers and artists to begin to pay attention to the under classes. Thomson's extensive experience in Asia made him uniquely suited to take on the poverty in his own back yard. Thomson's London photographs are beautifully rendered, but they also function as moving documents of people who were living on the edge of society.

Unfortunately, this was not the kind of work that could sustain Thomson's stillgrowing family. Accordingly, in 1879 Thomson set up a studio in London where he specialized in portraits and took on various commercial assignments. He continued his studio work until around 1910, when he finally retired.

Thomson's legacy lies in his extraordinary versatility as a photographer and his ability to capture in his photographs and writing the salient features of a broad range of subject matter. He photographed and wrote about individuals from all walks of life with remarkable equanimity. His work can be seen as a precursor to much ethnographic and anthropological work that developed in the twentieth century. Thomson brought to his photography a rare combination of visual virtuosity and keen intellectual curiosity.

DAVID JACOBS

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THORNTON, JOHN EDWARD (c. 1865–1940)

John Edward Thornton was born around 1865 and started his photographic career in 1885 when he was twenty. By the end of 1886 he was trading under his own name in Manchester selling photographic equipment. By then he had also been granted several photographic patents.

He started the Thornton Manufacturing Company and introduced several cameras and his patent roller-blind shutter which proved popular. A need for capital to expand the business seems to have been required and by 1887 Thornton was working with Edgar Pickard and a formal partnership, under the name The Thornton-Pickard Manufacturing Company commenced in January 1888. The success of Thornton's roller-blind shutter which had sold 12,000 units within three years allowed the firm to build a new factory in Altrincham. The factory, which was mechanised, produced shutters and an extensive range of cameras starting with the Ruby field camera. Thornton-Pickard became a significant British volume manufacturer of cameras in the period 1890–1914.

Edgar Pickard died in 1897 and his brother George Arthur Pickard joined Thornton as joint managing director. The same year Thornton reported that shutter sales had shown an increase of 11 percent and camera sales 264 per cent with profits of £7255. The company began to concentrate on producing cameras where greater profits were to be had. In 1898 after an Extraordinary General Meeting Thornton was forced out of the company the result of him trying to respond to increased competition by developing new products, notably sensitised film, in the face of the opposition of Pickard who wanted to maintain the company's existing product range. Over the long term Thornton's strategy was shown to have been the correct one.

Under Pickard the Thornton-Pickard company initially continued to expand. The factory was increased

to 20,000 sq ft and employed 250 employees in the pre-1914 period. The company mass-produced a range of cameras from traditional mahogany field cameras to amateur hand, box and folding cameras and, from 1908, reflex cameras. During the war it developed aerial cameras for the government but after 1918 it failed to innovate its consumer and professional products and despite attempting diversification into toys in the 1920s with Picabrix it gradually declined as a photographic manufacturer. TP ceased trading in 1959 by which time it was only undertaking photographic repairs.

After 1898 Thornton continued to patent a range of devices relating to photography and other subjects and he tried, unsuccessfully to expand into film production and undertook other business ventures before he moved to the United States. He seems to have had some success with cinematography and was earning royalties from Kodak during the 1920s.

Thornton returned to Britain and died on 5 October 1940 forgotten by the photographic industry that he had been part of fifty years previously.

MICHAEL PRITCHARD

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TILBROOK, HENRY HAMMOND (1848–1937)

Tilbrook was born in Llandudno, Wales, and arrived in Adelaide, South Australia, with his family aboard the *Albermarle* in 1854. He worked as a compositor for the *Register* newspaper and after other work including a stint in New Zealand looking for gold he established the *Northern Argus* newspaper in Clare in 1870. He became a keen amateur photographer in the dry plate era, making numerous trips into the surrounding countryside and beyond. After retiring in 1891 he moved to East Adelaide and he made a number of lengthy photographic (and hunting) excursions including visits to the Flinders Ranges in 1894, Mount Gambier in 1898, Mount Bryan in 1899, Mount Gambier to Robe in 1900 and Mount Gambier and Portland, Victoria in 1905. He created albums of prints, stereoviews and enlargements but did not make a commercial venture of this although some of his enlargements were supplied to the Railways Dept to decorate train carriages in 1901. Tilbrook made detailed notes of his travels in diaries and a collection of his photographs and glass negatives was acquired by photographic historian R. J. (Bob) Noye and is now in the State Gallery of South Australia. An exhibition of his work was held there in 2001.

MARCEL SAFIER

TINTYPE (FERROTYPE, MELAINOTYPE)

A process first introduced in the mid-1850s, the collodion and later gelatin-based images on thin metal sheets were customarily sent through the mail to sweethearts and family. Though popularly called "tintypes," they were never made of tin. Tintypes have been produced in the studio, by itinerant photographers and by the general amateur. Tintypes became the vacationers' keepsake, the Sunday strollers' memento. Ironically, the tintype, which so permeated the lower working class of society, rarely outlined its social problems and other struggles. Rather the tintype image, largely through the use of studio props, created an ersatz lifestyle and does little to further our understanding of the working-class life. This suggests that it is wise to remember that photographs cannot stand alone as interpretative statements about the past, any more than can other primary sources.

The tintype was immensely popular in North America from late-1850s onward and, to a much lesser degree in Europe and elsewhere. The use of collodion chemistry eventually gave way to gelatin emulsion manufacture by the early-1890s. This genre survives even today and noticeably practised by street photographers in Central and South America and India.

Ferrotypy is the proper technical name for the process. The words "ferrotype" and "tintype" are often used interchangeably to describe the light-sensitive plates, and "tintypist" to describe the photographer. These and other terms proliferated throughout the popular language and in commercial and technical publications (see Appendix).

The tintype was the particular application of Frederick Scott Archer's wet-collodion process. A japanned (i.e., blackened) sheet of thin iron was substituted for the ambrotype's glass support. The plates were coated with collodion, quickly sensitized and immediately exposed in the conventiona "wet plate" manner. The "tintypist" would develop and fix the plate, and cut it apart with tin shears. Formats ranged from postage-stamp size "gem" tintypes (approximately 1.5 × 2 cm) to the large "double whole" plates (21.5 × 33 cm). (Though technically inaccurate to classify a tintype by "plate" dimensions, popular nomenclature prevails.) Tintypists enhanced the image by applying assorted water- or oil-based colours and protective shellacs to its surface.

Collodion Ferrotypy

By 1853 Parisian college professor Adolphe Alexandre Martin presented to the Société d'Encouragement and to

the French Academie des Sciences two *Compte Rendus* which outlined processes to make direct positives on glass and on tinned plate or galvanized iron. His reports had little impact on a nation still enamoured with the daguerreotype and certainly with the new albumenized paper processes. Apparently unaware of Martin's work, Hamilton L. Smith, professor of natural science from Rambier, Ohio, carried out similar work with a seminary student, Peter Neff Jr. during 1853–54 and then independently in 1855. In 1856, on the advice of Neff, Smith obtained U.S. Patent 14,300 (February 19, 1856), to make "ferrotypes." The patent suggested that black japan needed to coat the metal plate (before one can make it light-sensitive) could also be applied to "leather, fibrous materials and rubber." William Kloen and Daniel Jones Enlgand also patented the "ferrotype" that same year. Europe, with its predilection for social classes, showed no interest in the "lowly" process. Peter and William Neff eventually purchased the patent rights for the manufacture of the plates.

In spring 1856 Peter Neff promoted the new process through a pamphlet entitled *The Melaintotype Process, Complete*. By October, American innovator Victor Moreau Griswold applied for two patents to improve the process. Soon-to-be-competitor Griswold criticized the name "tintype," calling it "senseless and meaningless." He sarcastically pointed out that "not a particle of tin, in any shape is used in making or preparing the plates, or in making the pictures …, unless it be, the *tin* which goes into the happy operator's pocket after..." In 1863, tintypes were purchased for as little as two cents each and still proved profitable! Oliver Wendell Holmes pushed to have 'the 'tin-types' "properly" renamed 'stannotypes.' (Ironically, Holmes' "stannotype" might refer to iron-black colour but its root *stannous* refers to any compound containing tin.)

By early 1857, continued experimentation resulted in improved resistance and assorted hues (blue, green, red and chocolate) to the japanned surfaces. The japan or varnish was made with linseed oil, asphaltum and sufficient umber or lampblack to give the desired shade, boiled, then tested for consistency—thinned with turpentine if necessary—and eventually brushed onto the metal, and oven-dried. Other possible ingredients included mastic, lac or copal varnishes and other shades of colouring matter. The reported manufacture of white enamalled plate susceptible to produce a negative image never materialized.

From mid-1850s to early-1860s, Neff and Griswold were the sole manufacturers of tintype plates in North America. Through pettiness or excessive competitiveness, each threatened the other with lawsuits. Griswold cut his prices as he improved production of his plates. Neff countered by freely making available the necessary licenses to practise ferrotypey, since patents forced the photographic fraternity not only to buy the plates at monopoly prices, but also to buy the right to use them. Fees ranged from $25 to $300 for a "room-right license." Both failed to recognize early the weakness of their geographical location that eventually saw the manufacture of japanned collodion plates switch from their Ohio bases to the increasingly industrialized cities of Newark, New Jersey, and New York. By 1868 several companies had joined the fray: Holmes, Both & Hayden; Willard & Co.; and Anthony & Co. acting as distributing agents to several manufacturers. The Chadwick Leather Manufacturing Company of Newark, New Jersey, manufactured tintypes, but no evidence exists of its pannotype, i.e., the manufacture of photo-sensitized leather.

Horace Hedden or his son H. M. Hedden, of the Ph[o]enix Plate Company, Newark, New Jersey, created the "Chocolate" plate after obtaining a patent on March 1, 1870. This plate would temporarily renew the interest in ferrotypy. By August 1871, an English patent had been obtained.

The More Rapid Gelatin Dry Processes

While producing astounding results, collodion photography, by its shortfalls (i.e., the need to immediately prepare, sensitize and photograph), encouraged the search for a more convenient means of capturing an image. The new, consistent and reliable, gelatine dry plate of the 1870s would some twenty years later give rise to commercially manufactured gelatin-silver tintypes.

In 1871 Richard Leach Maddox invented and published the first practical formula for gelatin-silver halide emulsion. By 1873 prepared *gelatine dry* plates were being marketed in England. The following year Richard Kennett introduced the "high speed" pelllicle and subsequently offered prepared dry plates. The manufacture of the gelatin tintype however only came into existence in 1890. Basic emulsion manufacture ("ripened" emulsion) was cooled to a jelly; cut into noodles, washed of excessive chemicals and by-products; reheated (altering the chemistry) and finally coated onto a continuously moving roll of sheet metal support (i.e., the plates) and cut into standard sizes and packaged. In England's post-industrialized social climate, ferrotypy gained popularity, especially with the introduction of dry "ferrotype" plates by Ladislas Nievsky in 1891. Dependable development time varied from eight in hot climates to sixty seconds in polar temperatures. After fixing (1:5 ratio hyposulfite/water) for ten to thirty seconds, the plate was quickly rinsed, dried and then varnished.

The advent of the "street" camera, with built-in processing facilities removed the need for a portable darktent and contributed to the third and final resurgence of the tintype, especially in North America. By 1894 The Bosco Automatic (booth) Camera manufactured by

Bernitt, Hamburg, Germany, produced a small tintype shaped like a shallow tray. The recessed shape sequentially held developin /processing and fixing chemistry. Patrons entered the booth, paid their fee, and exited with a tintype self portrait within three to five minutes.

Appendix: Known Commercial and Popular Names

Adamantean [1863+]
Adamantine [from c. 1861–63]
American instantaneous photography [Europe c. 1860]
American novelty [Europe c. 1870]
American Photography [Berlin, Germany 1878+]
American process [Europe, c. 1858?]
Anchor (mid-1860s–1870s, British, unsensitized plates exported to North America)
Atrograph [British, c. 1900–1950, technically a gelatin-based "ferrotype" on black paper]
Bon-Ton pictures [may refer to mounted ferrotypes or albumen prints; uncertain]
Cambria (mid-1860s–1870s, British, unsensitized plates exported to North America)
Celebrated Chocolate Tint [1871]
Champion
Chapman celebrated O.K. plate [?—1867] "from Charcoal Iron" [refers to the high-quality English sheet iron used by U.S. Manufacturers]
Chocolate tintype [1871+]
Chromo-Ferrotype [1871+]
Columbia
Diamond [may relate to protective varnish for Adamantean plates]
Egg-shell Ferrotype [c. 1858–1900, considered industry standard]
Eureka [c. 1861–1870]
Excelsior
Fallowfield [c. 1910–1915, British commercial plates "collodion emulsion" ferrotype dry plates]
Ferrograph [first mentioned 1856 in *Photographic Notes*]
Ferrotype [1857–1867, with a resurgence ca1891]
Ferrotype [1856– present]
Gartle (mid-1860s–1870s, British, unsensitized plates exported to North America)

GEMS

Glossy Ferrotype [c. 1858–1900, considered industry standard]
Helion
Imperial ferrotype
Iron plates
Lettergraphs
Lettertypes
Letter-types

LITTLE GEMS

Melainotype [1856–1870; especially prevalent in Canada]
Melaneotype
Melanograph [1854; early wet-collodion experiments on paper; see Atrograph]
Phoenix [c. 1857–1870+]
Pontimeister (mid-1860s–1870s, British, unsensitized plates exported to North America)
Portraits sur zinc/Portraits on zinc; de tôle/on sheet metal [c. 1900 to 1930s, Quebec, Canada]
Sheet iron photographs [ca1898, Maryland, USA]
Silvertype [c. 1860, H.P. Moore (mfr), New Hampshire, USA; trademark for copied daguerreotypes]
Star Ferrotype
Sunplate [1870–1872, Scovill Mfg. Co., USA]
Tagers Iron, also Taggers Iron [c. 1856, unsensitized plates, American, often stamped]
Tinplate portraits [c. 1900–1930s, eastern Canada]
Tintype [1856–present]
Tintype on paper [c. 1900–1950, atrograph]
Tiny Gem
Union
Vernis [c. 1861–1862]
Wonder Photo-buttons [1900+, sold in England and USA; gelatin emuslion plates

PHILLIPE MAURICE

See also: Wet Collodion Negative; Archer, Frederick Scott; and Maddox, Richard Leach.

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TISSANDIER, GASTON (1843–1899)

It was as a scientific scholar, a public educator and writer, and an enthusiast for new inventions that Gaston Tissandier's major contribution to photography in the nineteenth century was made. His formative influences were in science, journalism and ballooning. Having completed studies at the Lycée Bonaparte, Tissandier studied in the chemistry laboratory of P.P. Dehérain at the Conservatoire des Arts et Metiers, Paris, before taking courses at the Sorbonne and the Collège de France. By the time he was only twenty-one (1864), he became Director of the Laboratoire d'essais et d'analyses chimique de l'Union nationale. Within three years he co-authored, with Dehérain, the 4-volumed *Elements of Chemistry* (Hachette, 1867–70) and was commissioned by Hachette to write four books for the series Bibliothèque des Merveilles (Library of Marvels), beginning in 1867 with *l'Eau* (*Water*) and progressing through to 1874 with monographs on Coal, Fossils and Photography. The first of these was certainly indebted to Dehérain, but the fourth in the series, *Les Merveilles de la photographie* (*Handbook and History of Photography* (1878)), reflected the young scholar's own interests. Tissandier continued to write many books on science, including those on dust particles in the upper atmosphere and on the construction of electrostatic dirigible balloons.

If science was his first love, writing was a close second. Aged twenty-three he began contributing to Edouard Charton's illustrated weekly on the arts, literature, history and sciences, *Magasin Pittoresque* (established 1833 to "instruct and moralise the new generations"), awakening in the young man a lifelong belief in education through the popular press. In 1873 Tissandier established his own illustrated scientific journal, *La Nature*, attracting the publishing support of Hachette after the first year. Tissandier wrote innumerable articles on all branches of the sciences for this journal, and as editor was able to attract the support of leading scientists. Much of the material that first came to light in *La Nature* was collated and expanded into one of his most influential tomes, *Les Récréations scientifiques* (1880), which presented science as knowledge attained through wonder and fun-filled experiments, most of them amenable to the home enthusiast. As a fluent writer and eloquent public lecturer, many of his books went into multiple, revised editions, and were translated into many languages.

A third formative influence was ballooning. Having made his début ascension on 16 August 1868, Tissandier went on to make many aerial voyages. Most of his ascensions were to further meteorological knowledge (e.g. analysing dust particles in the upper atmosphere) and the science of aeronautics (leading he and his architect brother and lifelong companion, Albert, to devise electric and propeller-driven balloons). Indeed, it is as a balloonist that Tissandier is now best known.

To these formative influences should be added patriotism, for Tissandier's ballooning expeditions over enemy lines during the Siege of Paris by Germany (1870–71) was not only rewarded with his being made a chevalier of the Legion d'honneur on 15 November 1872, but predisposed him to embrace the philosophy of the newly-formed French Association for the Advancement of Science which stood 'for country and for science.' According to his biographer, Le Cholleux, *La Nature* and his many other publications were driven by a desire to enhance the quality of science in France.

Tissandier's interest in photography is best revealed in three texts, *Les Merveilles de la Photographie* (1874); segments in *Récréations* (1880); and *La Photographie en ballon* (1886).His photography has its roots as much in popular entertainments of illusionism, as in painstaking scientific experimentation. 'Admirable photographs,' he argued in *Photographie*, reflect the 'skill of the physician and the taste of the artist,' and have 'colour, relief, delicacy and truth,' their 'rigorous precision' making them invaluable to the artist, architect, archaeologist, geographer, explorer, and those maintaining criminal and juridical archives. For Tissandier, aerial panoramas could assist surveying as much as military reconnaissance. Indeed, *Photographie en ballon* includes an albumen print frontispiece of the port of the Hôtel de Ville, Paris, 'taken at 600m. altitude by messieurs Gaston Tissandier and Jacques Ducom,' where the strongly intersecting diagonals of streets and bridges, remarkably modernist in composition, are delineated on a transparent overlay, to demonstrate its value as a map. This and other crisp aerial images, in fact taken by Ducom, were indebted to successful efforts to minimise shudder in the basket, and the use of M. Bacard's plates enabling exposures at 1/50 sec. He also collaborated with Paul Nadar, who photographed Versailles and Sevres from 800m. Tissandier wrote lucidly of the history, chemical processes and applications of photography. His enthusiasm for 'that sublime and beneficent art' rested on the camera's ability to accurately reproduce the human face, distant lands, and all the sciences from laboratory-based micrography to astronomy. Writing in a clear and accessible narrative style, often complemented by the inclusion of abundant images, his books and articles were written to inform and enthral young and old.

Tissandier was an amateur photographer, serving at various times as president and vice-president of the Société d'excursions des amateurs de photographie (founded 1887). He was a member of the Société française photographie, as well as societies of aerial navigation, meteorology, chemistry, and served on government commissions of military aerostations and civil aeronautics.

His prodigious publishing activity ensured that Tissandier was well known to his contemporaries in France and abroad. During his life he was included in national dictionaries of biography. Few authors in the twentieth century have referred to his work, and most only in passing and by reference to aeronautics.

CATHERINE DE LORENZO

Biographical

Gaston Tissandier was born in Paris on 20 November 1843, the second son of Paul Emmanuel Tissandier and Caroline Agathe Decan de Chatouville. Interestingly enough, all contemporary accounts give Tissandier's birth date as 21 November 1843, but the copy birth certificate at the Service des Archives départementales, Paris, clearly states his birth as 20 November 1843. The original birth certificate was destroyed during the Siege of Paris in 1871 when the Hôtel de Ville was set alight. Following his studies at the Lycée Bonaparte, he worked as a chemist at the laboratory of the Conservatoire des Arts et Métiers, before being named director of the Laboratory of Tests and Chemical Analysis of the Union Nationale in 1864. He published more than two dozen books, jointly authored nine more, presented more than ten major papers to learned societies, and wrote innumerable articles, especially on hot-air ballooning and popular science. He was the founding editor of the illustrated popular science journal, *La Nature*, His death certificate notes he was predeceased by his wife, Louise Anne Arbouin, and his brother noted that he had two children. Tissandier died 30 August 1899 in Paris.

See also: Nadar, Paul.

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TONING

Armand-Hippolyte-Louis Fizeau—the French physicist best known for being the first to develop a reliable method of calculating the speed of light—was responsible, in August 1840, for proposing some significant advances in the daguerreotype process. The most enduring of these was the use of gold chloride as a final chemical treatment after fixing—most recipes employed dilute solutions of both 'hyposulphite of soda' and 'chloride of gold' mixed just before use. This had several effects, marginally raising the contrast of a daguerreotype, slightly intensifying the image, and most significantly, increasing the stability and permanence of the delicate image. It also slightly changed its color, imparting a warm tinge to the darker areas of the image.

Despite the fact that this process changed the color of the daguerreotype image, it was invariably described in contemporary journals not as 'toning' but as 'fixing' or 'gilding.' The term 'toning' would not come into general use until well into the ascendancy of the paper albumen print. Gold chloride remained the basic building-block of the majority of toners throughout the remainder of the 19th century.

Writing on the subject in *The Dictionary of Photography* in 1897, Edward John Wall noted that "If a silver print is placed directly into the fixing bath, an

unpleasant brick-red color is the result." That brick-red color, and the wide range of other reds and sepias which could be produced when making both salt prints and albumen prints had long been considered unpleasant.

It was probably Louis-Desiré Blanquart-Evrard, the originator of albumen printing paper, who first proposed the application of the gold chloride toner to the paper print. Fortuitously it had the same preservative and stability effects which had been experienced with the daguerreotype, but also brought about a dramatic color change. The albumen image was, in its un-toned state, both reddish-brown, and unstable—neither of them desirable qualities. Relatively quickly the image deteriorated and the highlights—always a pale cream and less brilliant than had been previously experienced with the salt print—darkened and yellowed. The gold toner not only produced a rich purple/brown hue to the shadows, but also acted as an effective barrier to the yellowing of the highlights, as well as reducing image fading. The richness of many of the Victorian images preserved today attests to the effectiveness of the gold toner to an otherwise correctly processed print.

As understanding of the chemical processes deepened, it became clear that the acidity or alkalinity of the gold chloride bath had a significant impact on its effect. By the closing years of the nineteenth century, over twenty recipes for gold chloride toning baths were available in contemporary manuals—each offering a slightly different effect dependent upon its pH. An acidic solution was found to produce a reddish hue in the print, a neutral solution created the purple/brown colors so fashionable from the 1850s, and an alkaline solution tended towards the blue/black shadows, creating a much colder image.

With the introduction of the bromide print, and a broader understanding of chemical effect, a much wider range of print colors could be achieved by the end of the century—platinum toners produced a rich sepia, copper a bright red, vanadium a deep muted green, and iron toners offered a range of blues.

JOHN HANNAVY

See also: Albumen Print; Blanquart-Evrard, Louis-Désiré; Bromide Print; Fizeau, Louis Armand Hippolyte; and Wall, Edward John.

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TOPLEY, WILLIAM JAMES (1845–1930)

Photographer and businessman

William James Topley, was born 13 February 1845 at Saint John, near Montreal, Canada East, now Quebec and died 16 November 1930 in Vancouver, British Columbia.

Topley began his career as an independent tintypist but from 1864 apprenticed with William Notman, Montreal. At age 22, Topley took charge of the new Notman studio in Ottawa, the first established outside Montreal; by 1872 Topley was "proprietor" of the Notman studio, and in 1875 set up independently as The Topley Studio with a staff of fourteen. By 1880 he had vice-regal patronage, being appointed photographer to Governor General the Marquis of Lorne; this confirmed his reputation but did not appear to increase his income. The Topley Scientific Instruments Company, established in the 1890s, specialized in the repair and sale of optical and survey instruments and photostat machines; at the same time the Topley Studio started selling cameras and film and provided developing and printing services for amateurs.

While the studio specialized in portraits, including those of most of the leading politicians, it also did scenic work for the tourist trade and a great deal of commercial, industrial and government work, in Ottawa and Quebec, Ontario and the west. Some of Topley's work has been used on Canadian currency and postage stamps. Approximately 150,000 negatives are located at Library and Archives Canada.

Topley and his son William de Courcy managed the Studio from 1868 to 1923, successfully negotiating major changes in photographic methods and materials, accommodating business cycles and the advent of the snapshooter, but finally closing it because there was no family successor.

ANDREW RODGER

TOPOGRAPHICAL PHOTOGRAPHY

Dependence on a long history of pictorial and landscape conventions means that topographical photography inherited ways of seeing which precluded the sort of objectivity and inclusiveness which the medium was capable of delivering—much that was feasible from 1839 is absent but the reasons for these absences are complex. Processes were unwieldy, image permanence problematic, but, above all, demand hardly existed. The depiction of buildings, townscape and the human environment does of course occur—but the earliest evidence is frequently visible at one remove: daguerreotypes were employed as the source for line illustrations. This indirect application of photography is most evident in N.

P. Lerebour's *Excursions Daguerriennes* [1842]. In the United States the advanced development of daguerreotype technology meant that the depiction of topography is a little more common.

Only in France was there any form of official attempt to record the cultural landscape but even the Mission Heliographique proved to be a premature model for the systematic use of photography in a topographical or architectural manner. Depiction of isolated cultural treasures and picturesque landscape precluded many representations of personal and public spaces. A recent pioneering photographic survey of Antwerp acknowledges these visual absences but also noting that the smells, sounds and urban historical context necessary to allow proper interpretation. Apart from the work of a few photographers such as Charles Marville in Paris and Thomas Annan in Glasgow who were commissioned to record redevelopment or slum clearances there is only weak or indirect visual evidence for the reality of Victorian culture: the objective eye of the camera was simply not pointed in directions we now want to explore.

The daguerreotype quickly became ubiquitous—much is known of work in Egypt, Palestine, Jordan, India and North Africa and South America but it is significant that in Canada the earliest known topographical views are recorded as late as the mid-1850s. Unlike the sophisticated application in the United States, topographical daguerreotypes in many other countries were never taken or do not survive. This absence is directly related to absent markets—especially in tourism. Viable marketing and distribution conditions are necessary for photographic production but even when both the technology and the incentive existed, prevailing fashion dictated specific 'polite' forms of coverage avoiding whole sectors of the society in question: all topographical 'records' and 'views' are clearly limited by both social and market forces.

It is only very recently that some of the earliest topographical collections have surfaced at auction (Gilbert de Prangey) and the extent of knowledge and image survival is still fragmented. Much of what we know has only developed since the 1970s and is dependent on haphazard factors—in the market, in academia and in the variable criteria applied to digitisation. The archaeology of photography and the genealogy of image generators remain undeveloped discipline but an emerging global outline of topographical collections means that key figure like Russell Sedgefield (born in Devizes, Wiltshire) is best known through family sources in New Zealand and Australia, Gustave le Gray's later Egyptian life can now be linked with his earlier fame in France, and the surviving archives of key Scotish topographical companies (James Valentine, George Washington Wilson) are being made available online (in Scotland) It can also mean that more is known about the North American work of a mobile photographer like William England than any of the rest of his English or international work he mostly executed for the London Stereoscopic Company, whose remit was by no means restricted to London or even England.

Sophisticated marketing and distribution systems and the dispersal or amalgamation of collections means that interpretation of apparently national concerns may require international context. 'Local' views may indeed be generated by local photographers but many similar views were produced by major commercial companies so that an understanding of business history starts to become necessary. In particular the huge market for stereoscopic views confirms the need for a global overview. Negretti and Zambra consciously sought the views created by Francis Frith in Egypt which they knew they could sell in key locations where there was domestic demand for tourist views such as the Crystal Palace at Sydenham. Later Underwood and Underwood operated on an international basis and competed with European companies for the lucrative stereo market. However, the massive educational and tourist output of such companies was still constrained by the landscape and fashion conventions. The reach of individual photographers like Felice Beato could extend beyond the Mediterranean basin as far as Japan—indeed his complex nationality and extended travels illustrate the sheer breadth that one photographer could encompass. In a cultural sense, however, barriers still existed: for much of the century topographical views signally avoided social realities allowing images to be culturally integrated in historical terms.

In France, Britain and the United States the combination of industry, commerce, empire and antiquarianism succeeded in producing a global photographic era. John Thomson is famous for work in the Far East yet his extensive operations in his home country (apart from his famous publication on London street life) are little known: as the chosen photographer for the English branch of the Rothschild dynasty he may have been better remunerated for his opulent English architectural commissions than for his views of Japan. Based in Alsace Adolph Braun dominated European tourist views as well as creating a monopoly for tourists intent on acquiring or appropriating gallery images associated with the Grand Tour. Braun and Frith represent the new industrial application of photography which before the advent of wet collodion was pioneered by Blanquart-Evrard in Lille: the first mass production of topographic views occurs in limited form in the early 1850s but was succeeded within a decade by the massive printing operations by Francis Frith in Reigate, Surrey and by Adolph Braun in Dornach. By the 1860s the beginnings of huge national branch empires are evident such as A & G Taylor of London who combined chains of portrait

studios with topographical work using the full industrial printing techniques. Such mass production (often mixed with portraits) means that the study of such photographic concerns has be merged with knowledge of printing or lithograph companies if we are to understand the first generation of mechanical processes driven by the increasing audience for topographical images for the burgeoning tourist market. So all images from the 1860s need to be assessed in such a light: Fratelli Alinari in Florence dominated the Italian tourist market, William Lawrence of Dublin dominated Ireland, Notman becomes a major producer in North America based in Montreal, and Matthew Brady signals the advent of the photographic combine in the United States. Careful distinction needs to be made between these 'super-companies' who with others must be seen as a distinct category quite separate from individual photographers or small firms such as F M Sutcliffe of Whitby who also undertook more mundane commissions like recording the Whitby branch of the Woolworths chain store. The same photographer could equally embrace both the picturesque and romantic as well as the more practical or commercial aspects of the same region.

It is only later in the century with the availability of cheaper equipment and processing that a demand appears for nostalgic delineations of the lost national cultures now dominated by industry. Yet the very industrial and urban environments which had helped to create and popularise photography are often the very elements least evident in topographical views.

IAN LEITH

See also: Lemercier, Lerebours & Bareswill; Mission Héliographique; Marville, Charles; Annan, Thomas; de Prangey, Joseph-Philibert Girault;; Le Gray, Gustave; Valentine, James and Sons; Wilson, George Washington; England, William; London Stereoscopic Company; Negretti & Zambra; Frith, Francis; Underwood, Bert, Elias & Elmer; Beato, Felice; Thomson, John; Braun, Adolphe; Blanquart-Evrard, Louis-Désiré; Frith, Francis; Braun, Adolphe; Taylor, A. & G.; Alinari, Fratelli; Notman, William & Sons; Brady, Mathew B.; and Sutcliffe, Frank Meadow.

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TOURIST PHOTOGRAPHY

Travel and travel reports have been associated with each other since ancient times. The Greek Odyssey is no more than a travel report; the same for Gulliver's Travels and many other more or less fantasy tales and 19th Century photography was able to provide more reliable information about far away places.

Nineteenth century travel was marked by an earlier 18th century idea that travelling was a "grand tour" in which any well born, young, rich gentleman should take, seeing historical places, like Italy, in order to see ancient sites, architecture and art. Travelling and enlightenment

were typically closely linked. With the advent of photography, tourists, with the help of the *Camera Lucida,* or from other optical devices commonly photographed monuments and anything of interest, including William Henry Fox Talbot as he did during his 1830s travels.

By the mid 19th century this kind of travel was well established, however, difficulties with using cameras prevented most travellers and novice photographers to have to purchase images from independent professional travelling photographers. At the same time large commercial photographers started to see an important market in photographing distant or exotic places. Not surprisingly, the locations appearing in early travel photography were similar or the same places considered worthwhile to "grand tour" travellers such as Italy and Greece for the classical travellers and the Holy land and the Middle East for the biblical and exotic travellers.

During the19th, century new means of transportation allowed travelling large distances to be made with greater speed and comfort. Photography, since the mid 19th century was an important travel companion. Coincidentally, the train and camera were invented almost at the same time, and technological progress in photography paralleled the growth of railway lines in most developed countries, suggesting perhaps a symbiotic relationship. Both however answered the needs of industrial society and middle class aspirations. In the late 19th century, lighter cameras and dry plates, made travel photography more widely available to the well-heeled traveller and to middle classes. From the 1890s onward, travel was to be one of the most important genres for photography.

Mid-19th century travel photographs were mainly produced by professionals such as Francis Firth, Antonio Beato, Felix Bonfils and the Zangaki brothers in the Middle East; the Bisson brothers for the alpine mountains; the Alinary brothers in Italy; Charles Clifford or J. Laurent in Spain, John Bourke in India, Felice Beato in China and Japan, Carleton Watkins and Eadweard Muibridge in the North-American west or Cunha Moraes in Portuguese Western Africa. These professional photographers travelled on photographic expeditions using whatever transportation they could to take pictures. Then, they produced their images and sold them in both small and large formats, as well as in stereograms. Generally the images taken on these trips were for those who could not travel, often serving as a substitute for travelling.

Often travellers would carry their photographic souvenirs with them when they returned home. These were typically studio portraits that had been taken abroad and served as proof of travel. Also, these images were representative of affluent classes and linked the owners to high society as represented by the fashionable photographer. This idea of having one's likeness taken at a major travel destinations came early in History of Photography. Daguerreotypists had been active at Niagara Falls since the late 1840s where they targeted the tourists who travelled to this important destination in American. Many 19th Century people had their picture taken for the first time at other vacation or tourist destinations as well like beach or other tourist spots.

Even though there were great difficulties involved in travelling and photographing with mid 19th cntury cameras and processed, there were quite a few amateurs among the travelling photographers such as George Moir (1800–1870), a founding member of the Edinburgh Callotype Club, college professor and latter Sheriff of Ross-shire, and photographer of Ghent; Sir James Dunlop (1830–1858), photographed Malta and Italy in the course of a "Grand tour" in the late 1840s; another Scot, Robert McPherson (1811–1872) photographed Rome and its surroundings, as did Giacomo Caneva (1813?–1865) from Padua. Since the 1850s every major European country had its gallery of amateur travelling photographers, including the Germans even if they seemed to be less active than others.

Later, local photographers understood the potential of the tourist market selling views and images of local or indigenous people to travellers. Even if this was a worldwide practice, Samuel Bourne took a good part these types of images especially in India, the most striking example of tourist photography however came from photographer Christiano Júnior, who produced and sold studio pictures of slaves as a souvenir to those visiting Brazil. Even ambulant photographers understood the new market potential, placing themselves close to main tourist attractions in order to make visitors "instant" photographs.

With late 19th century technical progresses in photography there was a bigger place for one of the most popular photo motivations, travel. Newer cameras that were smaller in size and easier to operate were created as were dry plates, which did not needed to be sensitised before exposure, making travelling with a camera painless. Travelling itself also became much easier as trains were able to go farther distances in smaller amounts of time, and because of this the travel industry was developing, catering not only to the upper classes, but to a middle class as well, which began to take part in tourism.

It the late 19th century, the photographic industry saw the emergence of cameras that were smaller and lighter which made hand held exposures possible. This innovation created a new market potential for tourist photography. This practice was compatible with not only simpler and cheaper Kodaks, but also for the more expensive hand cameras like Ernemman; Voigtlander; Contessa and Goerz. Furthermore, some inventors even developed a special type of camera for the tourist mar-

Beato, Antonio. Group at Abydos.
The J. Paul Getty Museum, Los Angeles
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kets like tropical cameras which were made to deal with warm, humid climates and a special bike cameras was invented to allow people to carry a very light camera while cycling.

To further develop people's interest, photographic societies were started allowing people to pursue both photography and travel, or even sometimes, photography and cycling. The train and the bicycle were the two main travel companions for the 1890s photographers, replacing the mule cart used by photographers of the daguerreotype and wet plate decades.

Besides travelling to new places an increasingly large group of society was enjoying parts of the summer at seaside resorts. Even though these resorts were mostly class segregated, photography played an equal part in the summer for all classes, starting from the small trade of ambulant photographers to the high-class studios from the large cities migrating with his well-heeled clients.

This usually local summertime tourism meant that a good amount of tourist photography from the later 19th century was made in the photographer's own country. Some spots with a special aura would evoke that country's history and meaning. Some figures, like Shakespeare in Great Britain, and others that were seen as particularly important would have their lives as imagined by photographers explored and photographed, not only by a large number of amateur and professional photographers, but images of their houses would appear in photographically illustrated books and tourist guide books. Each country created its own photographic stereotypes, one for instance was that England was magic and small, and another was one where Spain exotic and grand.

With mass travel and mass tourism came the distinction between the tourist and the traveller, the former being unable to grasp below the surface of things, being

the second able to enjoy aesthetically the pleasures of the landscape. This means that there was a complete social set of what deserved to be photographed and what did not, the landscape, coming from 18th century painting was a socially constructed one. Some of these conventions are still important in today's tourist photography.

This need for tourism to the most significant parts of a country came, also, from the idea that the countryside was soon to disappear under the huge wheels of the industrial society. To photograph what was about to disappear, creating a link between past, present and future, was a duty to photographers. Sir Benjamin Stone even proposed this to be done systematically, being the resulting photographs deposited at the British Museum; some other such attempts were made locally, or in other countries.

Nationalism, the need for History and the 19th century obsession with classification, is all associated with tourist photography. Tourist photography can be loosely defined as a class experience and one that is dictated by convention. The socially constructed landscape of 19th century tourist photography came from 18th century painting and picturesque notions which continued through into 20th century tourist photography. Photography became an important part of travel and, for some, the only way of seeing far away places. Perhaps though, the success of tourist photography came instead from the need of creating memories of special moments and the proof of status it gave.

NUNO DE AVELAR PINHEIRO

See also: Great Britain; Spain; Júnior, Christiano; and Instantaneous Photography.

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TOURNACHON, ADRIEN (1825–1860)

French photographer

Alban-Adrien Tournachon was born in Paris in 1825 to Victor Tournachon and Thérèse Maillet. He was the younger brother of Gaspard-Félix Tournachon, better known as Nadar, a name he adopted in 1838 as his *nom de plume*. By the 1840s, Nadar was famous for his caricatures and his incendiary writings for leftist Parisian journals. Nadar let Adrien work at his studio, where he learned caricature. He soon decided that Adrien should learn photography and opened a studio that he would partially own and Adrien would run as the principle operator. For training, Nadar placed Adrien with Gustave Le Grey, a photographer known for his landscapes and his technical skills. Nadar's friend Louis Le Prévost funded the studio, which opened in early 1854 at 11 boulevard des Capucines, a fashionable area filled with photography studios. Adrien soon claimed exclusive credit for the studio, which he decided to run alone.

Like Nadar, Adrien photographed artists, although he never achieved his brother's level of success. He is best known for the physiognomic studies made for Dr. Guillaume-Benjamin-Armand Duchenne (also known as Duchenne de Boulogne), a French physiologist and psychiatrist credited as the founder of electrotherapy, between 1853 and 1854. The photographs represented the 19th century obsession with mental illness, a subject of great scientific and artistic study. Adrien photographed patients at the Parisian hospital, Salpêtrière, where Duchenne worked and Géricault created his studies of psychological problems. Featured in Duchenne's 1862 book, *Mécanisme de la physionomie humaine, ou analyse élector-physiologique de l'expression des passions applicable à la pratique des arts plastiques* (*Mechanism of Human Physiognomy, or Electro-physiological Analysis of the Expression of the Passions Applicable to the Practice of the Figural Arts*), the photographs illustrated various emotional states that Duchenne achieved through electric shocks that stimulated muscles. Adrien mainly photographed an elderly male patient, who expressed reactions including terror, fear, amazement and displeasure. The photographs reflected the influence of Positivism, a philosophy based on the Enlightenment principles of scientific analysis and classification that sought truth through observation and study. Visually

Tournachon, Adrien. Self-Portrait. *The Metropolitan Museum of Art, Gilman Collection, Purchase, The Horace W. Goldsmith Foundation Gift, 2005 (2005.100.44) Image © The Metropolitan Museum of Art.*

interesting, the works show chiaroscuro and a baroque use of space. Attribution is generally given exclusively to Adrien, who signed the works "Nadar jeune," as historians are unable to find evidence that Nadar worked on these images. Two works signed "Nadar jeune" were found in Duchenne's own collection and in his text, Duchenne wrote "Monsieur Adrien Tournachon, whose skill as a photographer is known to all the world, kindly contributed his talent by shooting a few of the pictures in this scientific portion."

Yet despite this commission, Adrien's studio was not successful. By mid-September 1854, Nadar returned to the studio and the brothers worked together. By this time, Nadar was trained in photography and had access to supplies, chemicals and studio equipment, in addition to celebrated and wealthy clients. During the period of 1854–1855, the brothers collaborated on portraits of Ernesta Grisi (the wife of Théophile Gautier), Alfred de Vigny, Edmond and Jules de Goncourt, and Gérard de Nerval. Although the subjects were photographed in Adrien's studio, the photographs have a psychological dimension more associated with Nadar.

The most famous images the brothers made were the series featuring the character Pierrot, as played by Nadar's friend, the mime Charles Deburau fils. It is unclear what each brother contributed to the photographs. In one image, Pierrot is shown holding pieces of paper that said "ad. Tournachon" and "nadar j," both in reference to Adrien, as was the stamp "TOURNACHON 11 Boule. des Capucines," Adrien's first signature and the studio where he and Nadar worked. The photographs also reflected Adrien's physiognomic studies, printing technique and his larger, 12 × 9½ inch plates. However, their expressive, theatrical quality connects the works

to Nadar, who was more familiar with the work of Charles Deburau and his father, Baptiste. Nadar used his influence to have the series, submitted under the name "Nadar jeune," exhibited at the 1855 Exposition universelle where it won a first-class medal. In a review published in 1856 in *Photographic Sketches* (*Esquisses photographiques),* Ernest Lacan praised the works for the emotional quality of the mime's body and face. Like most critics and historians, he saw the works as a collaboration and attributed the works to "Messrs. Tournachon and Co."

Yet this collaboration was not to last. Nadar left the studio by mid-January 1855 and in October, Adrien, with two new backers, opened a studio, Tournachone Nadar et Companie, at 17 Boulevard des Italiens. Because Adrien was working as *Nadar jeune*, often minimizing the *jeune* to "*jne*" written in small type and in Nadar's celebrated script, Nadar was forced to exhibit under the name *Nadar aîné*. Despite Nadar's repeated requests and financial incentives, Adrien refused to stop using *Nadar jeune* until Nadar sued him to claim the name exclusively for himself and his family. Nadar also claimed authorship of their photographs and attempted to recoup money invested in their studio. By January 1856, Nadar opened a studio and signed works *Nadar et Cie/Nadar Société de Photographie Artistique* 113 R. St. Lazare" and "Nadar/113, rue St. Lazare, *pas de succursale*" (Nadar/113 rue St. Lazre, no branches) in reference to Adrien. Although Adrien won the first suit in 1856, he lost the December 12, 1857, appeal, with the court declaring Félix "the only, the true Nadar."

Adrien's new studio was initially successful and in 1855, he became a member of the *Société française de photographie.* However, by 1858 his studio was bankrupt. He tried to appeal the court's ruling, but was denied in June 1859. Later that year, the estranged brothers were reunited due to their mother's illness. She died in February 1860 and, as a last wish, asked Nadar to help Adrien with his floundering career. Nadar settled some of his debts and purchased Adrien's photographic equipment, even though he had paid for most of it six years earlier.

Between 1862 and 1864, Adrien ran a new studio with J.P. Johannes at 124, avenue des Champs-Elysées, where he created portraits of animals, such as angora goats and horses. In April 1867, Adrien opened a firm dedicated to photographic enamels, which failed and was closed by 1872. He continued to produce work and exhibited with the Société des Artistes Françaises at the Salon of 1884. In 1893 Adrien entered the retirement home at Sainte-Perrine, then the pension Galignani at Neuilly, where he was treated for mental illness. He spent his last decade in mental institutions before dying on January 24th, 1903.

Since the late 1970s, historians have reevaluated Adrien's photographic legacy. Comparing photographs made by the two brothers reveals both their differences and the extent of their collaboration. While Nadar's role has been acknowledged in works signed exclusively by Adrien, it is also clear that Adrien significantly contributed to works made by the two.

JENNIFER FARRELL

Biography

Alban-Adrien Tournachon born 1825 to Victor Tournachon and Thérèse Maillet in Paris. Younger brother of Gaspard-Félix Tournachon, known as Nadar. Adrien studied photography with Gustave Le Grey. Between 1853 and 1854, Adrien created physiognomic studies for Dr. Guillaume-Benjamin-Armand Duchenne, known as the founder of electrotherapy. In early 1854, Adrien opened a studio at 11 Boulevard des Capucines, partially funded by his brother, Nadar. They worked together for four months between until December and produced portraits of artists, friends, and clients. Their celebrated photographs were of the mime Charles Deburau as Pierrot, which were exhibited at the Exposition universelle in 1855. The brothers acrimoniously split and Nadar left the studio in January of 1855. In 1856, the brothers went to court over Adrien's use of the name "Nadar jeune" and financial issues. Adrien won the initial trial, Nadar eventually gained exclusive rights to the name. Adrien received acclaim for his animal portraits, yet his subsequent studios failed. In 1893, Adrien entered a retirement home for mental illness. He died on January 24, 1903.

See also: *Société française de photographie*; and Nadar (Gaspard-Félix Tournachon).

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TOWLER, JOHN (1811–1889)

Born in Yorkshire, England, on 20th June 1811, Towler was educated in Yorkshire, Germany and Cambridge. He migrated to the United States in 1850.

The Silver Sunbeam: A Practical and Theoretical Text-Book on Sun Drawing and Photographic Printing: Comprehending all the Wet and Dry Processes at present Known, with Collodion, Albumen, Gelatine, Wax, Resin, and Silver; first appeared in 1864, from the New York publishing house of Joseph H Ladd. It became one of

early photography's 'best sellers' with sales exceeding nine thousand copies over a fifteen-year period in America alone. Several thousand more copies were sold in Britain, and yet more in three Spanish-language editions. It was the comprehensive nature of the book, and the accessibility of Towler's text, which attracted such significant sales. In nine editions, new discoveries and inventions were appended as they were introduced, and by the 1879 edition, the 351 pages of the first edition had swelled to 599. He went on to write several other important books and manuals on photography, but none captured the imagination, or achieved the sales enjoyed by *The Silver Sunbeam*. Towler edited *Humphreys Journal of Photography* from 1864 until 1867.

Other publications included essays on dry plate processes (1865), photography on porcelain (1865), and the production of high quality prints (1866, 1870), and several translations of works from the original German.

From 1882 until 1886 he served as US Consul in Trinidad.

JOHN HANNAVY

TOWNSHEND, CHAUNCY HARE (1798–1868)

British art collector, writer, and poet

Townshend was born on 20 April 1978 at Busbridge Hall, Godalming, England, the only son of a landed gentleman, Henry Hare Townsend and his wife, Charlotte. (Chauncy Hare Townshend added the letter 'h' to the family surname in 1827 when he succeeded to the family estates.) From an early age Townshend was encouraged to take an interest in the arts. He was educated at Eton College and Trinity Hall, Cambridge where he won the Chancellor's medal for his poem *Jerusalem*. In 1826 he married Eliza Frances Norcott.

Townshend took holy orders but felt unable to pursue this vocation due to a nervous complaint –a combination of melancholia and hypochondria to which he succumbed during the 1820s or 30s—that was to plague him for the rest of his life. However, his passion for travel and collecting, his contacts with distinguished friends, and his enormous personal wealth allowed him to lead an active and fascinating life. The experience of Townshend's journeys in Britain fed into his first published prose work, *A Descriptive Tour in Scotland* (1840). He was an accomplished amateur painter and draughtsman, musician and composer and an ardent advocate of mesmerism, aspects of which are now known as hypnotism. He published *Facts in Mesmerism* (1840) and *Mesmerism Proved True* (1854) and also practised the technique on others. He moved in the highest social and literary circles in London hosting musical evenings at his house at 21 Norfolk Street, (now Dunraven Street) looking on to Hyde Park. Among the many guests were the poet Laureate Robert Southey and the novelist Wilkie Collins, much of whose description of "Mr. Fairlie" in *The Woman in White* is modelled on Townshend. Charles Dickens is said to have taken Townshend as his inspiration for the character of 'Cousin Feenix' in *Dombey and Son* and became a close friend, dedicating *Great Expectations* to him. He acted as literary executor after Townshend's death and edited his posthumous *Religious Opinions* (1869). After separating legally from his wife in 1843, Townshend spent his winters in Switzerland at his villa near Lausanne on the Lake of Geneva.

Townshend's wide-ranging interests in the 1840s and 50s informed his taste in his large, eclectic collection of pictures including oil paintings, watercolours, prints and photographs. Many of his acquisitions adorned the walls of his houses or would have been kept in portfolios and presses for viewing. He remains one of the few identifiable British private collectors of early photographs, on any significant scale, apart from Albert, the Prince Consort. After his death in London on 25 February 1868, *The Times* described Townshend as "a collector of rare judgement and exquisite taste." A bequest of porcelain, glass, watches, geological specimens, curios and the bulk of his library was made to the Museum at Wisbech, Cambridgeshire, near his country estates. The bequest to the South Kensington Museum (later renamed the Victoria and Albert Museum) was instigated at the suggestion of one of the curators, G.F. Duncombe, who put the idea to Townshend while accompanying him on a tour of the Museum. This bequest contained some of the finest treasures in his remarkable collection including photographs, paintings, prints, drawings, books, gemstones, coins, cameos and intaglios. This bequest ensured the rare survival of a key group of art photographs from a 19th century private collection.

An inventory of his collection made at his London home shortly after his death (V&A Archive) reveals how Townshend grouped and housed his collection. It also gives a valuable insight into his taste in photography that encompassed many of the major French and British names of the 1850s. He had visited the Exposition Universelle, Paris, 1855 and may have noticed works by Gustave Le Gray and André Giroux there but could have purchased fine photographs such as these at London dealers such as Murray and Heath. Townshend's photographs fall into three groups: those he kept carefully housed in presses also containing his watercolours and print collection old master etchings and engravings, (including Rembrandt) topographical and architectural views, drawings, zoological plates and leaves of dried plants; books illustrated by photographs which were shelved with the other books of his library; and stereoscopic photographs and daguerreotypes kept in cases in the "Front Room" or study. The stereographs and

daguerreotypes remain untraced, as does one photograph of a waterfall by an un-named photographer which is listed as being framed and hung among the paintings.

Of the holdings of Townshend's photographs still extant in the Victoria and Albert Museum the greatest group are twenty by Le Gray, comprising mainly his Fontainebleau forest pictures and celebrated seascapes, considered today to be among the finest selections of his surviving prints in the world. Among the other important photographs are a number by Camille Silvy, including his masterpiece *River Scene, France*, (1858), André Giroux's landscape *The Ponds at Obtevoz (Rhône)* (c.1855) and architectural studies by Édouard Baldus and the Bisson Frères. Among Townshend's photographically illustrated books is *The Sunbeam*, (1859)—edited by Philip H. Delamotte, including photographs by him and others such as Joseph Cundall, Francis Bedford, George Washington Wilson and John Dillwyn Llewelyn—William and Mary Howitt's *Ruined Abbeys and Castles of Great Britain* (1862) and photographic reproductions of J.M.W. Turner's compilation of drawings, the *Liber Studiorum*, photographed by Cundall, Downes & Co. (1862). Like many of his Victorian contemporaries, Townshend was also fascinated by popular and eccentric figures. The collection contains portraits of such people Mr. Rarey the famous American horse trainer with the stallion "Cruiser" by Caldesi and Montecchi (1858) and the champion boxers, John C. Heenan, "The Benicia Boy," and Tom Sayers, by George Newbold (1860). Townshend's interest also extended to pictures of topical interest at the time shown in Roger Fenton's Crimean war images and some remarkable scenes of ruined houses in the aftermath of the "Clerkenwell Explosion" taken by Henry Hering. On December 13th, 1867, a hole was blown in the prison wall at Clerkenwell House by Fenians attempting to release one of their group. The photographs record the extent of the resulting damage to buildings. These were some of the last objects collected by Townshend before his death.

Martin Barnes

See also: Expositions Universelle, Paris 1854, 1855, 1867, etc.; Le Gray, Gustave; Giroux, André; Victoria, Queen and Albert, Prince Consort; Silvy, Camille; Baldus, Édouard; Bisson, Louis-Auguste and Auguste-Rosalie; Delamotte, Philip Henry; Cundall, Joseph; Lemere, Bedford; Wilson, George Washington; and Llewelyn, John Dillwyn.

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Reverend C. H. Townshend Bequest Registered File, Victoria and Albert Archive.

TRAVEL PHOTOGRAPHY

The link between photographic practice and the activity and experience of travel was forged before Louis Jacques Mandé Daguerre's process was announced to the Parisian public in 1839. The symbolic meeting of activities occurred at the meeting in 1838 of two principals when the eminent geographer and explorer Alexander von Humboldt visited Daguerre in his studio. Humboldt met with Daguerre in the geographer's role as member of the committee appointed by the Academie des Sciences to evaluate Daguerre's claim that he had perfected a process to record and fix through chemical means the images produced in the *camera obscura*. As Schwartz argues: "at a time when travel was embraced as a way of seeing and knowing the world, photographs offered a new means of acquiring, ordering, and disseminating geographical information" (Schwartz, 1996, 16). Travel was the primary means of gathering the empirical knowledge of the world; travelers' accounts supported by printed illustrations based on sketches, topographic views, and maps produced during the course of travel disseminated that knowledge. The emphasis on travel as a mode to acquire knowledge is part of the nineteenth-century emphasis on collecting, categorizing, and possessing the world associated with the sciences of geography, anthropology, and archaeology. After the introduction of photographic processes, whether as permanent image on metal plate or paper print, photography became the preferred and trusted mode of creating and presenting the visual records of travel because it was derived from the "neutral" operations of chemistry and optics. Later, travel as a method of empirical knowledge pursued by a relatively small cadre of explorers gave way to travel as part of the burgeoning activity and industry of tourism—the organized consumption of place as leisure activity. Photography participated in the change to touristic consumption as a record and validation of leisure travel and by creating and amplifying the desire to participate in leisure travel activities.

The first practitioners of travel photography were amateur enthusiasts who pursued their interests in the new technology of image making as they undertook travels for official, commercial, or personal interests. Joly de Lotbinière and Frederic Goupil-Fesquet sepa-

rately came to be photographing the Sphinx on the same day in November 1839, scant weeks after Daguerre's public demonstration. Lotbinière went on to make an extensive daguerreotype record of his travels over the next year. Jules Itier (1802–1877), a government functionary in the French trade ministry, was an early adopter of Daguerre's technique and made daguerreotypes on trade missions to Senegal (1842) and China, Singapore, the Philippines, Borneo, and India (1843–1846). Baron Louis Gros, a French diplomat, made and exhibited daguerreotypes of the monuments and landscapes he encountered on extensive travels in the Americas, Greece, and England. While yachting in the Mediterranean in 1845, Christopher Talbot, William Henry Fox Talbot's cousin, and Reverend Calvert Jones made a number of calotype views, including early two part panoramas of Naples. The Reverend George Bridges (active 1846–1852) photographed extensively during a tour of the Mediterranean and North Africa. Ernest Benecke (active 1851–1853), the son of an Anglo-German banking family, also compiled an extensive calotype record of travels perhaps undertaken to familiarize himself with family business interests in the region. In most of these cases, the work was shared privately or had limited exposure in exhibitions organized by the newly formed photographic societies. Lotbinière is the exception in that his work was reproduced in some of the first books to feature illustrations derived from photographs—those by Lerebours and Horeau, for example.

Excursions daguerrienes, representant les vues et les monuments les plus remarquables du globe (1840–44), published by the Parisian optician Nicholas Lerebours, was the first book of travel images derived from daguerreotype images. *Excursions* eventually comprised 100 plates of views of Egypt, Italy, Greece, Russia, France, and other countries provided by a number of early daguerreotypists. In this first use of the photographic image as document of travel, images were reproduced as engravings derived by tracing the outlines of the daguerreotype image and then laboriously adding by hand the exquisite detail which the daguerreotype was capable of rendering. Although a very few plates were printed directly from the daguerreotype plate using Fizeau's process, the plates were engraved copies after daguerreotypes. While *Excursions* was the largest and earliest photographic entry into the travel book market, it was rapidly followed by others that reproduced either daguerreotypes or calotypes through engraving, aquatint, or lithography—see for example, Hector Horeau's *Panorama d'Egypte et de Nubie* (1841) and Pierre Tremaux's *Voyage au Soudan oriental et dans l'Afrique septentrionale exécutés de 1847 a 1854* (1852–1854). The first travel book with direct photographic illustrations was Maxime Du Camp's *Egypte, Palestine et Syrie* (1852). Du Camp's book comprised 125 calotype prints derived from paper negatives nade during a lengthy journey in 1849 to 1851, printed by Blanquart Evrard, and accompanied by short texts supplied by Du Camp. Although the work was judged extraordinarily successful—Du Camp was awarded the Legion of Honor in recognition of his achievement—probably no more than 350 copies were printed.

These initial productions defined an elite market for deluxe photographically illustrated travel accounts for the scholar or arm-chair traveler. While amateurs continued to make photographs on their travels, entrepreneurial photographers realized that market demand could be better and more economically met by superior printing technology utilizing wet collodion glass plate negatives from which a large number of albumin prints could be made. Frances Frith should be credited with developing and refining marketing strategies for travel photographs by recognizing the existence of distinct market segments. Beginning in 1856 with his views of Egypt and the Holy Land, Frith produced photographs in a range of formats, including stereo-views, which were affordable to a growing middle class while appealing to Victorian ideals of self-improvement by offering direct visual knowledge of the world. After first working with established publishers, Frith formed his own photographic publishing firm—Frith & Co.—which continued to offer, throughout the nineteenth century, views of local and foreign destinations from a network of operators, as individual prints, collected in volumes, and in sets of stereo cards.

The photographically illustrated travel account, which paired text that reported incidents encountered en route and offered instruction in the history and culture of the region with photographs, functioned as both the document of a completed journey and the stimulus for journeys of the imagination. Frances Bedford accompanied the Prince of Wales' 1862 tour of Egypt and the Holy Land as the official photographer. On his return, prints were offered for sale through his Bond Street gallery and later compiled in *The Holy Land, Egypt, Constantinople, Athens, etc*. (1867). Both offered the British public vicarious participation in the royal journey and a record of the tour. The production of images of foreign or distant locales, ala Frith, Bedford, and innumerable other operators, was accomplished within a distinct set of practices associated with view photography, defined by expectations shared by maker and consumer. View or topographic photographs did not suggest or allude to a place, they delineated it precisely. Dramatic effects of light and shade that might confuse the presentation of a complete, spatially coherent, record of site were avoided. A well-executed view was as much a map as it was a picture, offering a clear understanding of the disposition of structures, access into and within the space, and relative scale and distance. Indeed, the fine detail

of glass plate negative/albumin print could provide an almost tactile registration of the materiality of physical space—the grit of masonry and sand, the smoothness of plastered walls, or subtle texture of wood.

As the industry of leisure travel grew, a development which can be dated to the first package tours to the Crystal Palace exposition in 1851, photography and the activity of travel became ever more intimately entwined. Travel views at once satisfied a demand for views of the world to those who would never visit the places shown, as they encouraged the consumption of places which were becoming more broadly accessible through organized tourism. Thomas Cook was one of the earliest, but by no means the only operator, offering package tours; Cook's Tours brought a growing number of middle class travelers to the Universal Exposition in Paris in 1855, to holiday destinations in Great Britain and Continental Europe by 1860, and to Egypt and the Holy Land in 1869. Expanded access to leisure travel altered the point of purchase of travel photographs but not the standards for the way in which place was inscribed as view. Travelers could purchase photographs of the sites they visited along their route. Commonly loose prints were purchased and arranged in elaborate photographic albums which served as the recapitulation of the journey, although local photographers did offer commercially printed albums dedicated to the particular area. While these albums operated as souvenir and proof of status for a traveler, they also retained the earlier connections between travel, photographic record, and nineteenth-century knowledge making. A number of photographic Tour de Monde albums were placed in public reading rooms or libraries, as a source of instruction for those who could not travel (Mickelwright, 2003. Local photographic studios were common at major sites after the late 1850s and nineteenth-century travel guides listed the best local sources for photographs. Commercial photographers offered photographs specifically for the visitor wishing to preserve the sights he or she encountered in the course of travel, including a variety of staged photographs of local life which had more apparent than real connection to his or her experience as tourist. Native "types" photographed in cafes, dimly lit courtyards, or "domestic" surroundings offered the illusion of connection with the foreign other that was seldom provided by the protected experience of the package tour arranged and managed to cause the least discomfort to western travelers. Maison Bonfils and Abdullah Freres in the Middle East, Bourne and Shepherd, and John Burke in India; Georgio Sommer, Fratelli Alinari, Tommaso Cuccionni, and Robert Macpherson in Italy; Muybridge, Watkins, and Jackson in the American West; Jakob Laurent and Charles Clifford in Spain; Felice Beato and his successors in the Far East; Baldus in France; and George Washington Wilson, Francis Frith, and Roger Fenton in the United Kingdom, to name just a few—were photographers with large commercial offerings of travel views available both on-site and through publication and distribution networks in European and American cities. Views of the Alps by the Bisson brothers (1860) and Charles Soulier (1869) recorded mountaineering, another form of leisure activity that developed as tourism expanded. Rail journeys were recapitulated by photographers in France (Baldus) and the United States (Rau and Jackson), as rail travel accelerated access to distant places. Increasingly railroad companies, who understood that leisure travel passengers offered a significant potential market, enticed those travelers by photographs which celebrated the engineering accomplishment embodied by the railroad and offered the inducement of miles of unfamiliar landscape to delight a passenger's eye. In the United States, the Santa Fe Railroad Company commissioned both painters and photographers to provide images calculated to whet the public appetite for the visual attractions of the American Southwest. Commercial photographers—initially subsidized by the railroad company—set up shop at rail stations and tourist destination hotels, also subsidized by the railroads.

Stereo photography was particularly well suited to travel images, offering as it did an immersive experience of place through the combination of the three-dimensionality of the image and the restricted field enforced by the viewer (Schwartz 1996). The effect of "knowing" the place seen through the stereoscopic viewer was reinforced by the inclusion of didactic text on the reverse of the card. A number of major publishers of stereo images—Underwood and Underwood, Kilburn Brothers, Frith and Co.—dispatched photographers to locations, events, and the aftermath of disasters around the world to feed the extensive market for entertainment and instruction. Realistic Travels Publishers offered stereo views of the far reaches of the British Empire from offices in London, Delhi, and Cape Town; views that reinforced imperial possession while providing instruction to future colonial officers. Stereo series of foreign and exotic locales continued to be widely marketed through the 1930s. Touted as an entertaining form of armchair travel and an educational tool, they could be found in parlor as well as classroom.

Perhaps the last manifestation of commercial photographic practice associated with travel in the nineteenth century was the development and rapid proliferation of the picture postcard industry at the end of the nineteenth century. By the 1890s, travel views sized to meet new postal codes and reproduced in collotype (also known under a number of proprietary names such as Phototype, Heliotype, Albertype, and Lichtdruck) or photolithography became a standard accompaniment to travel. By 1888, the halftone process and later a chromo-halftone

process, which provided rudimentary colored images, made picture post cards ever more available and less expensive. The picture postcard—mailed to friends and family or collected as souvenir—reigned as the commercially produced photographic marker of travel for the next century (Geary and Webb). After 1885 and the introduction of the Kodak, a unitary system of camera, film and processing that reduced the complexity of the photographic act to "You push the button and we'll do the rest," the commercial image was paralleled by the personal, informal, traveler's snapshot. Kodak advertising connected "Kodaking" to the modern pursuit of leisure—outdoor activities such as biking and automobile touring, and, of course, travel—and ads featured prominently the Kodak woman as tourist with camera in hand (West, 40). The personal snapshot and the commercial picture postcard dominated travel views throughout the twentieth century, only to be supplanted at the end of the century by digital images posted on users' spaces and accessed electronically from any computer.

Photography and travel, including the transformation of individual travel through the burgeoning tourism industry, are central and distinct elements of modern life from the nineteenth century forward. The centrality of these linked phenomena has been the focus of critical analysis from a variety of theoretical positions. Analysis of the cultural formations of travel and its associated imagery have addressed the economic and social implications of consuming the world as image and mediated experience (Osborne, Gregory, Taylor)The experience of travel, the visual record of distant locations, and the dissemination of that visual record were recognized as important elements of the social and political structures that reinforced imperial and/or colonial control of distant lands. Thus travel photography has been viewed through the lens of post-colonial critiques of power and resistance (Ryan, Nordstrom, Micklewright, Gregory). Ryan argues that photographic practice was an essential tool in the formation and maintenance of British imperial rule. Taylor focuses on the use of photographs of the British Isles to construct national identity through a shared tourist experience. Gregory defines the production of personal travel photographs by the amateur as one of the central acts in the performance of touristic explorations of the world.

In all of the critical discourse surrounding travel and photography are cores assumptions relating to the value of knowledge production in the nineteenth century and the power of the photograph, by virtue of its perceived transparency and veracity, to transmit knowledge of the world. Prior to the advent of photography, extensive travel was considered the ultimate source of knowledge of the world. Travel books might offer the traveler's journals expanded with observations and field notes, buttressed by research and citations from other authorities, perhaps accompanied by reproductions of sketches and plans, but these were partial and mediated experiences of direct knowledge—valuable but inherently flawed. As Schwartz (2003) argues, the photograph became the surrogate for the direct experience of the world, acting as a neutral, impassive eye in distant places. Not a pale substitute for direct experiential knowledge but a form of knowing that offered advantages over physical travel because it permitted careful and repetitive examination of place, and facilitated comparison between distant places. The assumption that photography functioned as a technologically based system which mechanically produced direct observations of the natural world ensured that photography wielded the intellectual power that allowed it to operate as a tool of imperial and colonial control, a means of structuring national identity through shared place, the underpinning of commercial tourism, and ensures that it continues to provide proof of experience to modern day travelers, despite our understanding of the suspect nature of photography's claim to truth.

KATHLEEN STEWART HOWE

See also: Daguerre, Louis-Jacques-Mandé; von Humboldt, Alexander; Itier, Jules; Gros, Baron Jean-Baptiste Louis; Daguerreotype; Talbot, William Henry Fox; Jones, Calvert Richard; Africa, North (excluding Egypt and Palestine); Benecke, Ernst; Calotype and Talbotype; Lemercier, Lerebours and Bareswill; Italy; Greece; Russia; France; Egypt and Palestine; Du Camp, Maxime; Blanquart-Evrard, Louis-Désiré; Frith, Francis; Topographical Photography; Expositions Universelle, Paris (1854, 1855, 1867 etc.); Underwood, Bert and Elmer; Halftone Printing; and Kodak.

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TRÉMAUX, PIERRE (ACTIVE 1853–1868)

French, photographer, architect, architectural historian

The architect Trémaux was a member of the Académie des Beaux-Arts and Société de Géographie, and winner of a second place Prix de Rome in 1845. He was born in 1818, and is known for a extensive, profusely illustrated, three-part publication on the architecture of Africa and Asia Minor: *Voyage au Soudan oriental et dans l'Afrique septentrionale exécutés de 1847 a 1854* (1852–1854); *Une parallèle des édifices anciens et modernes du continent africain* (1861); *Exploration archéologique en Asia mineur* (1862–1868). Trémaux explored the use of photography for illustration, initially using photographs, as well as drawings, as source documents for lithographic plates. In 1853–54, he made calotypes in Egypt which were bound into volumes in addition to lithographs. The photographic prints deteriorated rapidly and he replaced them with lithographs. For the third part of the series, he turned to Poitevin's photolithographic process. Despite the technical shortcomings of his photographic work, Trémaux's calotypes are recognized as some of the earliest photographs of the people of Egypt.

KATHLEEN HOWE

TRIPE, LINNAEUS (1822–1902)

Working in India and the East in the mid 1850s the photographs of Linnaeus Tripe, along with those of his contemporaries John Murray and Samuel Bourne, rank amongst the finest of the period. Tripe, an accomplished amateur, was amongst several army officers seconded from military duties to record antiquities, architecture and ethnography of the continent and created a body of work which, though highly regarded by his contemporaries, has until recently been sadly overlooked.

Born in 1822 in Devonport, England, Linnaeus Tripe was the ninth of Cornelius and Mary Tripe's twelve children, his siblings including Theophilus, Octavius, Lorenzo, Septimus and Algernon. Tripe studied mathematics and the classics and at seventeen he joined the East India Company as an ensign. By the early nineteenth century, the East India Company itself had evolved from a small trading company to control much of India, employing both political and military rule to protect its commercial interests. The 'Government' was organised into three Presidencies of Bombay, Madras and Bengal respectively. Tripe was stationed with the Madras Establishment, rising from humble ensign in 1839 to honourary Major General by his retirement in 1875.

Tripe's first known photographs were taken between 1853 and 54 around his hometown of Devonport towards the end of a three and a half-year furlough. On his return to India he continued with his new hobby and while on leave in December 1854 took a series of photographs around Halebid and Belur. These prints were greatly admired when shown at the Madras Exhibition of 1855 and Tripe was awarded the first class medal. At this time the Government of India was already showing interest in photography as a more cost and time efficient method to document and record antiquities than commissioning traditional artists. In 1855 they sent a mission to Ava to persuade the King of Burma to recognise the British annexation of Lower Burma following the Second Anglo-Burmese War of 1852. Captain Tripe, probably as a result of his success in the Madras Exhibition, was appointed official photographer and during the three and a half-month trip he produced nearly 220 calotype negatives. In truth, due to sickness and bad weather, Tripe had only 36 working days in which to photograph the region. This was indicative of the problems of the 19th century photographer in India: heat, dust, and flies in summer, damp humid conditions and sickness during the monsoon months, the rapid deterioration of chemicals, and difficulties procuring and transporting the bulky equipment were regular complaints. For many of these reasons Tripe preferred the calotype, modifying Le Gray's waxed paper process to suit his needs. However even this method was not without its difficulties and Tripe complained that the wax often melted in the heat leaving spots on the first prints "so as to spoil them."

On his return to the photographic department in Bangalore Tripe began the labourious task of printing 50 boxed sets from 120 negatives selected from the trip for The Government of India—a total of over 6,000 prints. The skies of these Burmese views have a pronounced granular texture and lack of definition, a fault typical of early negatives since different exposures were needed to record sky and solid objects. Tripe blacked out the sky on his negatives completely so it printed white,

Tripe, Linnaeus. Basement fo a Monolith in the Raya Gopuram, Madura.
The Metropolitan Museum of Art, Gilman Collection, Purchase, Cynthia Hazen Polsky Gift, 2005 (2005.100.381.1.9) Image © The Metropolitan Museum of Art.

dubbed artificial clouds or settled for the grainy 'salt and pepper' effect. Tripe had begun printing when the Madras Establishment again requested his services as Government Photographer but printing the Ava views prevented him from taking up the post until the beginning of the following year. The aims of his new post were to photograph the southern states of the province, recording important items of interest to historians, antiquaries, and architects, to document different races, and to initiate other photographic projects.

The post also required Tripe pass on his knowledge and he taught the calotype process to employees of the public works department of Madras and the collodian process to pupils of the Madras school of Industrial Arts that spring. While teaching in Madras Tripe photographed the exhibits of the 1857 Madras Exhibition (and a number of prominent Madras civil servants) using the collodion negative process. On his return to Bangalore he printed around 1,800 prints for the government and a further 1,000 for public sale. Printing again delayed the start of his next project: a photographic tour of the Southern States of the Presidency. He finally set out in December 1857 taking four bullock carts to transport his equipment on a trip that lasted seven months—much of it during the troublesome hot season. Tripe produced 275 paper negatives, 16 collodian glass negatives and 160 stereographs on glass. His subjects included the temples of Madura, Seringham and Tanjore, the palaces of Madura, Tanjore and Poodoocottah, the forts at Trichinopoly and Trimium, landscapes around the beautiful Salem district, and the Elliott Marbles in Madras. This body of work is considered to be his best and once more the Government ordered many sets of the prints. Back in Bangalore, Tripe and his assistants began printing once again, however a new problem faced the department. As a result of the Indian Mutiny the British government had taken over the rule of India from the East India Company in late 1858. The new Governor of the Madras Presidency viewed that in such difficult times the Photographic Department was "an article of high luxury" and soon ordered its closure on grounds of excessive costs. Tripe was to be allowed to finish work in hand, but there would be no new commissions. Tripe argued strongly against the decision, but to no avail and

on completion of printing and finalising the accounts in 1860 he left for England on a two-year furlough disappointed and in poor health.

Tripe returned to military duties in 1863 and his last known photographs were taken in 1870 while stationed in Burma. In 1873 he returned to Devonport, England, retiring from the army in 1875. During the 1880s he was active in local charities, and indulged a passion for collecting shells and corals, some of which were acquired by British Museum after his death in 1902. His photographic record shows not only diligence and determination to carry out his commission well, a technical mastery of his medium, especially the calotype process, but also a great visual awareness and sympathy for his subject, producing some of the finest architectural studies of the period.

SARAH MCDONALD

Biography

Born in Devon, England on 14 April 1822. Educated in classical and mathematical studies at Devonport Classical School. 1839 joined the Madras Establishment of the Army of the East India Company as a Cadet of Infantry. First documented photographs taken around hometown of Devonport 1853—54. Photographs taken on leave around Bangalore 1854 received the first class medal in the Madras Exhibition of 1855.

Appointed Official Photographer to the Government of India Mission to Ava (Burma) in 1844 and following year appointed as government photographer to the Madras Presidency taking up post in 1857. Photographed exhibits in the Madras Exhibition and Madras residents followed by a photographic tour of the Southern Districts of the Presidency. Published various volumes in 1858: *Photographic Views in Madura; Photographic Views of Poodoocottah; Photographic Views of Ryakotta and other places in the Salem District; Photographic Views of Seringham; Photographic Views in Tanjore and Trivady; Stereographs of Madura; Stereographs of Trichinopoly.* 1860 Photographic Department of Madras Presidency closed. Last known photographs taken in 1870. In 1873 returned to England, retiring from the army in 1875 with honourary rank of major general. Died 2 March 1902.

Exhibitions

1855 Madras Exhibition of Raw Products, Arts and Manufactures of Southern India. Awarded First Class Medal.
1857 Madras Exhibition of Raw Products, Arts and Manufactures of Southern India.
1857 Photographic Society of Bengal Exhibition (Calcutta)
1859 Madras Photographic Society Exhibition

See also: Murray, John; Calotype and Talbotype; Le Gray, Gustave; Waxed Paper Negative Processes; and Wet Collodion Negative.

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TUMINELLO, LUDOVICO (1824–1907)

Italian photographer

Along with the painter Giacomo Caneva (1813–1865) from Padua, Tuminello represents outstanding, aesthetic Italian photography at the beginning of the introduction of the process to Italy. Although not always consistent in quality, at his best in landscape topography and architecture, he conveys, by control of tone, especially the use of strong contrasts, of dark shadow and bright light, and an expert selection of composition and viewpoint, the grandeur and emotional experience, the melancholy that is Rome. In this he mirrors the monumentality caught by both Caneva and Robert McPherson, the foremost photographer of the period. Born Rome, Tuminello started photography around 1842 but moved to Turin in 1849 for political reasons during the revolutionary upheavals in Rome. He returned in 1869 and commemorated in a panorama (three photographs) the siege of Rome by the Italian troops in 1870, including the breach of the walls. He also visited Sardinia, Egypt, Sudan and Tunisia on expeditions led by the Marchese Orazio Antinori. Tuminello persisted in using the calotype (along with glass negatives) after the sweeping success of the new wet plate process post 1851 when the market then became flooded with often nondescript images made exclusively for those on the Grand Tour: their success was to deny the photographer's personality. Tuminello bought and distributed Canova's picture library produced for the artists of the French Academy at the Villa Medici (and may have used some of his negatives as his own, not uncommon). In 1903 his archive was auctioned but some paper negatives are preserved in the Gabinetto Fotografico Nazionale in Rome. We still await a serious study of this remarkable photographer.

ALISTAIR CRAWFORD

TURNER, BENJAMIN BRECKNELL (1815–1894)

British photographer

Benjamin Brecknell Turner was born on 12 May 1815 at 31–32 Haymarket, London, the eldest son of Samuel Turner and Lucy Jane Fownes. He attended Queen Elizabeth's Old Palace School, Enfield, London, until 1831. At sixteen he was apprenticed to his father as a tallow chandler in the family firm Brecknell, Turner Ltd., which made and sold candles and soap from their premises at Haymarket. In 1836, the family moved to live in Balham, South London. In 1840, Turner travelled to Belgium, Switzerland, and Paris. At his father's death the following year he took over the family business. He continued his continental tour in 1845 with visits to Switzerland, Munich, Salzburg, Vienna, Prague, Dresden, Berlin, and Hamburg. In 1847 he married Agnes Chamberlain with whom he had eight children. The family lived above their shop at Haymarket. In 1849, at the age of thirty-four, Turner took out a licence for one guinea from Talbot to practice calotype photography as an amateur.

Turner's earliest surviving photographs were taken in and around the location where the family spent holidays at Bredicot, a farm four miles outside Worcester bought by Turner's father-in-law, Henry Chamberlain, in 1840. These pictures were made with a modestly sized camera, taking negatives of about 7½ × 5½ inches (19 × 14 cm). By 1852 he had acquired a larger camera taking impressive negatives of about 12 × 15 inches (30 × 40 cm). In this format in March that year he photographed the interior of the Crystal Palace in Hyde Park, London. It was probably the display of photographs held there at the Great Exhibition of 1851 that spurred him to greater ambition. His photographs, taken after the Exhibition had closed, capture the scale and elegance of engineering of the light-filled structure.

Two views of the Crystal Palace open his sequence from a unique album of sixty photographs—his major extant body of prints—entitled *Photographic Views from Nature. By Benjamin Brecknell Turner. Taken in 1852, 1853 and 1854, on paper, by Mr. Fox Talbot's Process*, now in the Victoria and Albert Museum. Unlike nearly all other British photographers, Turner remained faithful to Talbot's calotype paper negative process for most of his career. The collection of some 250 negatives made by Turner between about 1852 and 1860, preserved by the Royal Photographic Society, demonstrate that he occasionally doctored them by adding pencilled foliage details or blacking out skies with Indian ink. However, he chose mostly to use the newer albumen (rather than salted paper) print process. This results in an image that successfully combines the grainy quality of the negative with the depth and clarity characteristic of the print.

Apart from its opening images, *Photographic Views from Nature* contains examples of the kind of subjects which Turner would favour and excel at throughout the 1850s: English churches, abbeys, castles, cottages and farms—rural scenes and ancient architecture—especially in the counties of Worcestershire, Surrey, Sussex, Kent and Yorkshire. His choice of canonical Picturesque subjects—rustic scenes, ivy-clad ruins and trees—was drawn from the English water colourist tradition of the pre-photographic generation. Updating his subjects for the photographic art, Turner understood the power of the medium to capture both broad handling of light and shade and to render minute, textural detail. Typical examples include, *At Compton, Surrey* (c.1852–4 showing an ancient barn and farmyard with thatched hayricks, *Whitby Abbey, Yorkshire, from the North East*, (c.1852–54) capturing the brooding ruins and *Hawkhurst Church, Kent* (1852) remarkable for its almost perfectly symmetrical reflection in the village pond. *Scotch Firs, Hawkhurst* (1852) was his most frequently exhibited photograph. The 1850s was one of the last decades before mechanised farming and the expansion of the rail network changed the landscape irrevocably. Turner's works contain a reverence for the disappearing older order. Because of their long exposure times (documented as up to half an hour) his photographs are largely unpopulated. This lends his work a timeless, meditative quality.

Turner's work was highly regarded in its day and constantly praised by reviewers. He exhibited regularly, beginning at the world's first ever purely photographic exhibition at the Society of Arts in London, 1852 and participated in photographic society shows throughout the 1850s in London, Norwich, Manchester and Glasgow. He exhibited at the Exposition Universelle held in Paris in 1855—the French follow up to the Great Exhibition—and was awarded a bronze medal. In 1862 he contributed nine photographs at the London International Exhibition.

Turner was a founder member and later a Vice President of the Photographic Society of London (founded 1853). He was also an honorary secretary and treasurer of the Photographic Club, within the society, which produced albums of photographs in 1855 and 1857. Members used the albums as a means of exchanging their works. Turner contributed a print of his own for both volumes and organised the 1857 album. At a glass-house studio, which he constructed above his London business, he took portraits in collodion of fellow photographers, friends and family. He also experimented with collodion negatives for landscape subjects in 1856 but the results lacked the charm of his works

from paper, to which he immediately returned. In May 1857 he travelled to Amsterdam to make some of the earliest photographs of the city. His sixteen surviving images from this journey concentrate exclusively on the canals. In 1860 he volunteered as an ensign in the Queen's Westminster's regiment but resigned in 1862. He moved from Haymarket to Tulse Hill, London in 1864. From 1873 he became concerned about the decline of his tallow chandling business and moved to a smaller house in the area but continued photographing until the 1880s, keeping pace with technology by making large carbon prints but showing much the same picturesque subjects he had explored in the 1850s. Agnes Turner died in 1887; her husband who passed away at Tulse Hill on 29 April 1894.

Martin Barnes

Biography

Benjamin Brecknell Turner was born on 12 May 1815 at 31–32 Haymarket, London, the eldest son of Samuel Turner and Lucy Jane Fownes. He attended school at Enfield, London until 1831. At sixteen he was apprenticed to his father as a tallow chandler in the family firm Brecknell, Turner Ltd., which made and sold candles and soap from their premises at Haymarket. In 1836, the family moved to live in Balham, South London. In 1840, Turner travelled to Belgium, Switzerland, and Paris. At his father's death the following year he took over the family business. He continued his continental tour in 1845 with visits to Switzerland, Munich, Salzburg, Vienna, Prague, Dresden, Berlin, and Hamburg. In 1847 he married Agnes Chamberlain with whom he had eight children. The family lived above their shop at the Haymarket. In 1849, Turner took out a licence from Talbot to practice calotype photography. Throughout the 1850s he excelled in photographing rural scenes and ancient architecture in England and participated in photographic society exhibitions around the country. At a studio above his London business, he took portraits in collodion of family, friends, and photographers. He travelled to Amsterdam in 1857 to make some of the earliest photographs of the city. In 1860 he volunteered as an ensign in the Queen's Westminster's regiment but resigned in 1862. He moved from Haymarket to Tulse Hill, London in 1864. From 1873 he became concerned about the decline in the tallow chandling business and moved to a smaller house in the area. He continued photographing until the 1880s. Agnes Turner died in 1887 followed by her husband who passed away at Tulse Hill on 29 April 1894.

See also: Expositions Universelle, Paris (1854, 1855, 1867 etc.); and Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851).

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TURNER, SAMUEL N. (active 1880s–1890s)

Camera manufacturer

Samuel N. Turner owned the Boston Camera Company which he started in 1884 and by the late 1880s the Blair Camera Company was acting as both his purchasing and sales agent.

In 1888 Turner designed and introduced a roll film camera called the Hawk-Eye which incorporated a roll film holder. This attracted the attention of George Eastman as it appeared to infringe the Eastman-Walker patent. In June 1889 Eastman and Thomas Blair agreed that the Eastman Company would supply the roll holders for the Hawk-Eye camera taking a royalty on each one sold.

In 1894 Eastman sought an injunction against the Boston Camera Manufacturing Company and their Bulls-Eye camera which had been designed by Turner and incorporated a daylight-loading film system. Turner's patent described using a flanged spool with sensitized film protected by opaque paper at each end to form a light-tight roll. He had developed a new system of roll film photography which did not infringe Eastman's patents.

The injunction was denied and Eastman began to develop a camera to compete called the Bullet which he introduced in March 1895. By June, after Eastman had been advised he was infringing Turner's patents, he negotiated a sole and exclusive license except for the Boston Camera Manufacturing Company to use Turner's system. Eastman introduced the Pocket Kodak in July and in August he bought the Boston firm outright and Turner's agreement not to manufacture cameras for five years. Turner was put on a $100 per month retainer in return for his ideas.

Eastman's activities with roll film opened a flood of litigation with Thomas Blair, Anthony & Scovill and Hannibal Goodwin which was to drag on into the early twentieth century.

Michael Pritchard

TYTLER, HARRIET CHRISTINA (1827–1907) AND ROBERT CHRISTOPHER (1818–1872)

The son of an officer in the Bengal Medical Service, Robert Tytler was born in Allahabad on 25 September

1818 and entered the Bengal Army in 1834. During the Indian Mutiny of 1857 he played a conspicuous part in the re-taking of Delhi, his wife Harriet (born in Sikora on 3 October 1827) being one of the few European women present throughout the siege. After the Mutiny, having received tuition from both John Murray and Felice Beato, the couple undertook an extensive photographic documentation of sites associated with the recent events. In the space of some six months in 1858, the couple produced nearly 500 large-format calotype negatives of Delhi, Cawnpore (Kanpur), Lucknow, Benares, Agra and other locations, which, when shown to the Bengal Photographic Society in 1859, were considered 'perhaps the finest series that has ever been exhibited to the Society.' While many of their photographs bear the clear compositional influence of both Murray and Beato, these images remain one of the most remarkable of the various photographic records of the mutiny, additionally impressive in the light of the couple's photographic inexperience. The Tytlers subsequently settled in Simla, Robert establishing a museum, with which he was involved until his death on 10 September 1872. His wife set up an orphanage in the hill station in 1869, where she also lived for the remainder of her life, dying there on 24 November 1907.

JOHN FALCONER

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UCHIDA KUICHI (1844–1875)
Japanese photographer

Uchida Kuichi was born in 1844 in Nagasaki, Japan. He may have first encountered photography through contact with the Dutch physician Johannes Pompe van Meerdervoort at the naval training school there. Uchida studied photography with Ueno Hikoma in the early 1860s. In 1865 Uchida and Morita Raizø opened the first photography studio in Osaka. Uchida moved his business to Yokohama in 1866, and then to Tokyo in 1869. Over the next several years he established a reputation as the finest portrait photographer in Tokyo. His fame resulted in a commission from the Department of the Imperial Household in 1872 to make the first official photograph of the Emperor Meiji. Uchida photographed the young emperor wearing traditional court dress. State authorities believed the image fed negative stereotypes of Japan as a regressive country, and commissioned another photograph in 1873 to show a more updated look. The later image, depicting the emperor in a Western military-style uniform and with a new short haircut, was widely distributed as the official imperial portrait. Uchida also traveled with the emperor throughout Japan in 1872, where he photographed the various locations visited as well as the public's response to the imperial entourage. Uchida's successful career was cut short when he died of tuberculosis in Tokyo in 1875.

KAREN FRASER

UENO HIKOMA (1838–1904)

Ueno Hikoma was born in Nagasaki, Japan in 1838. His merchant father, Ueno Toshinojø, imported Japan's first camera in 1848. Ueno's interest in photography did not stem from this event, however, but from studying chemistry at the naval training school in Nagasaki under Johannes Pompe van Meerdervoort, a Dutch naval doctor. Ueno was an intrepid student, constructing his own cameras from old telescope lenses and experimenting with various ways to make photographic chemicals, which were not yet readily available. In 1859 Ueno learned collodion wet-plate photography from the Swiss photographer Pierre Rossier, sent to Nagasaki by the London firm Negretti and Zambra. In 1862 Ueno published *Seimikyoku hikkei* (Chemist's Handbook), co-authored with Horie Kuwajirø. It included an appendix describing collodion wet-plate photography, Japan's first manual on the process. Later that year, Ueno opened a studio in Nagasaki, one of Japan's first, and he also began importing cameras and photographic supplies. Ueno became well known for both landscape and portrait photography. He photographed a number of important nineteenth-century figures, including former U.S. president Ulysses S. Grant. Other highlights of his career included assisting a team of Americans who came to Nagasaki in 1874 to photograph the transit of Venus across the sun, and photographing the battlefield during the Satsuma Rebellion in 1877. Ueno was one of Japan's most successful early photographers, later opening branch studios in Vladistock, Shanghai, and Hong Kong in 1890 and 1891. He died in Nagasaki in 1904.

KAREN FRASER

UKAI GYOKUSEN (1807–1887)
Japanese photographer

Ukai Gyokusen was the first Japan-born professional photographer, operating a studio in Edo (Tokyo) from 1860 or 1861 until 1867. Until recently his reputation has been overshadowed by Shimooka Renjo and Ueno Hikoma**'s** who nevertheless did not open their studios until 1862. It is strange that Ukai's significance was

forgotten since biographical details are carved on his gravestone in Yanaka Cemetery, Tokyo. Born into a wealthy samurai family, in Ishioka-shi, Ibaraki Prefecture, Ukai worked as a merchant in the sake business until 1831 when he decided to become a full-time artist. Nothing is then known until he decides to move to Yokohama in 1859 or 1860 with the intention of studying photography. His gravestone inscription confirms he consulted the American, Orrin Freeman, who had opened an ambrotype studio and was giving lessons. It then seems that he purchased, for a considerable sum, Freeman's camera, equipment, and a series of lessons before opening a portrait studio in Edo. At his studio, named Eishin-do, he photographed over 200 members of the aristocracy. In 1879 he was employed by the Government to photograph antiquities in western Japan. In 1883, Ukai unaccountably buried several hundred glass negatives adjacent to his final resting place in Yanaka Cemetery. (One of his ambrotypes is held by the *Yokohama Archives of History*, Yokohama.)

TERRY BENNETT

UNDERWATER PHOTOGRAPHY

Nineteenth century interest in utilizing the power of photography in all forms of scientific endeavour led the Englishman, William Thompson (1822–1879), to speculate on the use of photography as an inexpensive method of assessing the damage to bridge piers in time of flood. In February 1856 Thompson succeeded in making a weak collodion negative of the sea floor of Weymouth Bay at a depth by lowering a box containing a 5 × 4 inch plate camera on a rope some eighteen feet to the bottom. Thompson described his methodology in a paper "On Taking Photographic Images Under Water," published in the *Journal of The Society Of Arts*, May 9th, 1856, which is reproduced in *Historical Diving Times*, 19 (Summer 1997).

In 1866, the Frenchman, Ernest Bazin claimed to have made underwater photographs at his marine observatory. Bazin used a form of diving cylinder to enable him to descend below water with electric lights to illuminate his subject. However none of these images have survived and it appears that none were ever made public. While there are reports of photographs taken from a submarine by the German Wilhelm Bauer and various experiments by the Swiss F. A. Forel to determine the penetration of daylight through water by photographic means, the first major publication to utilise photography for the illustration of marine specimens was William Saville-Kent's *The Great Barrier Reef of Australia, its products and potentialities* published in 1893. However Saville-Kent's specimens were not photographed with an underwater apparatus.

The first systematic approaches to underwater photography were commenced in 1886 the Frenchman Louis Boutan (1859–1934) and his assistant Joseph David (1869–1922). Born in 1859, Boutan obtained his doctorate of science from the University of Paris in 1879. In 1880, at the time of the Melbourne Exposition, he was sent by the French Government to Australia to study the embryology of marsupials. He was appointed maître de conference at the University of Lille in 1886 before undertaking a mission to the Red Sea in 1890. In 1893 Boutan was appointed professor at the Arago Laboratories at Banyuls-sur-Mer, part of the University of Paris. By the end of that year Boutan had established the fundamentals of underwater photography.

Writing in *The Century Illustrated Monthly Magazine* in 1898, Boutan recalled that he was fascinated by the underwater landscape he found at Banyuls-sur-Mer when invited to use the Laboratory's diving suit. He wrote "why, I asked myself, could I not succeed in making a photograph at the bottom of the sea?" In a note in *Archives de Zoologie expérimentale et générale*, Boutan described the principal features of his underwater photographic apparatus, the plans for which had been devised by his brother Auguste, an engineer and manufactured by the firm of Alvergniat in Paris with anastigmat lenses by Darlot. These had the form of a rectangular metal box fixed to a metal tripod having adjustable legs, external controls for adjusting the shutter and diaphragm and changing the specially varnished Lumiere plates and a rubber balloon with which to adjust the buoyancy to the whole. One of these cameras was illustrated in the Century Magazine article together with several of Boutan's underwater images.

Initially Boutan found that back-scattering of light and the lower contrast gave unsatisfactory images on his "isochromatic" plates. After considerable experimentation he was able to obtain more satisfactory images by interposing a blue filter in front of the camera lens.

Several ingenious methods were employed by Boutan to illuminate his underwater scenes. In 1893 he collaborated with a French electrical engineer, M. Chaffour, to make the first flash bulb. Chaffour used a thick glass bottle, some 10cm in diameter, mounted with the neck down. He placed a coil of magnesium ribbon inside the jar before replacing the air with pure oxygen. An electric current was used to ignite the magnesium ribbon, producing a very intense flash of light. This system was not without its disadvantages. When ignited, the magnesium produced a dense cloud of magnesium oxide vapour which not only reduced the light output but also coated the inner surface of the bottle. Moreover the high temperature produced at ignition frequently caused the bottles to explode, even underwater. Although only an experimental model, the Chaffour flash established the principles for all future flash bulbs while Boutan had produced the first underwater image made with flash.

A more reliable, if cumbersome, system of illumination

was built by David for Boutan. An alcohol lamp was placed in a glass bell-jar secured to the top of a wooden barrel. An external reservoir of magnesium powder was connected to a metal tube placed just in front of the lens flame. Using a rubber bulb, Boutan was able to blow the magnesium powder into the flame to produce his flash illumination. A scale model of Boutan's camera and the "barrel" flash is on permanent display at the Musée de la Plongée, Sanary-Sur-Mer, France. A later system utilised carbon-arc lamps power by banks of batteries.

Boutan described in some detail his methodology for making underwater images. Descending to the bottom in a diving suit, he selected the area to be photographed, then signalled to the dive boat for the apparatus to be sent down, stand first then on signal the camera box and illumination source. Once set up, Boutan then signalled that he had commenced the exposure and waited for a signal from the boat to tell him when the required time had elapsed.

In 1898 he published the first book on underwater photography: *Photographie sous-marine et les progrès de la photographie*, Schücher Frères, Paris. The following year Boutan obtained sharp images of underwater vegetation at night and, using battery-powered arc lamps, images of a plaque at a depth of 50 metres. The exhibition of slides of his underwater photographs at the Expositions Universelle, Paris in 1900 and publication by Charles Mendel of more images in *La Photographie sous-marine*, with text by Pierre Guichard, served to further Boutan's reputation as the foremost underwater photographer of the time.

ROBERT DEANE

See also: Saville-Kent, William; and Expositions Universelle, Paris (1854, 1855, 1867 etc.).

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UNDERWOOD, BERT (1862–1947) AND ELMER (1858–1943)

Manufacturer of ten million stereo cards and 300,000 stereo viewers a year (1901)

The Underwood brothers built a Stereoscopic production and sales organization that surpassed all that had preceded them. By learning the door to door selling techniques of B. W. Kilburn of Littleton, New Hampshire, the Underwoods took the lead in the creation of the world's largest stereo view business. Even The Stereoscopic Company in Great Britain could not match their success.

Elmer and Bert Underwood, sons of the Reverend E. Underwood, were born in northern Illinois Elmer in 1859 and Bert in 1862.

Elmer started a publishing business there in 1879 whilst Bert worked in a grocery and then for the White Sewing Machine Company in Kansas City before becoming a sales agent for a medical book which he peddled from door-to-door throughout his assigned area on the edge of Indian Territory. A natural salesman, Bert became known among the farmers as "that boy who sells a book to everyone:' During his book selling trips in 1881, he met an agent for stereoscopic views and became convinced that if the merits of the then "out-of-date" stereoscopic views could be properly presented to the public they would prove to be fast sellers. Ordering a stock of views and a stereoscope he began to formulate a system for selling them that proved immediately successful.

Bert's sales grew so fast that within a few months he persuaded his brother to sell his publishing business and join him in expanding the stereo view business into other areas. At that time, the Underwoods were selling the stereo views published by Charles Bierstadt (Niagara Falls), J. F. Jarvis (Washington, D.C.) and the Littleton

View Company (one of B. W. Kilburn's competitors) in the sparsely settled areas west of the Mississippi. (Some of these early views have been found inscribed on the back "Sold by Underwood and Underwood, Ottawa, Kansas:') In a year's time the brothers had established their own group of sales agents (all trained in the Underwood method) working in Missouri and Kansas.

The Underwoods directed this sales force from a small office in Ottawa, Kansas. Many of these agents were recruited from colleges and universities. Some earned enough during the summer months to pay their entire college expenses for the year.

As their business grew, they documented the system in a manual that taught their agents how to successfully sell stereo views. To learn just how these agents plied their craft, a copy of their Sales Manual for 1890 was examined at the Oliver Wendell Holmes Stereoscopic Research Library.

The Underwoods divided their sales effort into two parts—the canvassing and the delivery. Canvassing included gaining a hearing, creating a desire to buy and obtaining a small order for a stereoscope or views. Upon delivering the original order a week or two later, they made their major pitch to sell more views.

The manual took the new agent, step by step, through a typical sales call, telling them what to say and how to handle all objections. The agent was instructed to greet the person answering the door with: "I have something very beautiful I want to show you. It will take just a minute:'

No mention was made of the product they were selling. If the prospect hesitated, they added: "It is something new in this line, and I can show you much better and easier than I can tell you:' If told there was no interest in buying anything they countered with: "Oh, I am only showing now and I have something so interesting I do like to show it. You can spare just a minute:' After gaining entrance, the agent laid his case down and removed the stereoscope saying: "Of course you have a stereoscope:' If the customer did not, the agent stated that they have never seen views through this type of glass. "Everyone says it is the finest lens they ever looked through:' The important thing was to get the customer seated and to hold the scope. The manual advised the agents to insert each view into the scope before taking the preceding one out so the customer was always looking at something, the better to hold their attention.

They made each view as interesting as possible by pointing out the objects of value, beauty or novelty in each. For example, "Phoebe's Arch, Palmer Lake, Colorado. Notice how far through that arch, across the landscape you can see. That farthest mountain is thirty miles from the arch. Isn't it something wonderful to cover such distance in a view" Remember, the manual advised the agent, "your customer will often see, in the views you show him, only what your words have the power to make him see. They credited the glass for the beautiful details and distances brought out in perfect relief. They dwelt on the power of the glass as a sale of the scope obviously produced a demand for views.

They attempted to close the sale by saying: "If I will bring you just as good a lens as this is in about two weeks, you will want one of them won't you? This scope is only ninety cents and if the one I bring is not as good as this, don't take it." Price was only mentioned after they had shown a number of sample views.

The agent then advanced numerous reasons the customer should have a stereoscope in their home—they cost very little and yet are so interesting; if company comes they can help entertain themselves with a stereoscope and a collection of views; children read, hear people talk then study about places in the views; they can never visit all these places as it would cost hundreds of dollars to visit only a few and the stereoscopic views, as seen through a good glass, will give them a better idea than they can get in any other way.

The agent concluded with: "Well, I shall put you down for the glass, shall I not, as it's only ninety cents:' The order was written up for "Scope and Views" and the customer was told: "You see, 1 have put you down for a scope and left the views indefinite. When I bring around your scope I will have a fine collection of views and our $2.00 per dozen views are the finest in the country."

If the customer already had a stereoscope, the agent switched the emphasis away from the lens, crediting all the fine effects to the superior quality of the clear sharp views, all from original negatives taken by the best view artists in the country. The agent worked prominent names into the sales pitch to influence the customer: "Dr. Jones liked that view very much. I have his order for a collection. The agents were told that local personal influences of this kind are impossible for anyone to resist entirely.

The experienced agents carried a small folder containing a list of prominent local people and their avocation who had purchased views. These were shown to the prospect with the comment: "Here is the Mayor you see, the Minister, the Postmaster, and of course, these Doctors, who have all purchased views for their collection:' The great secret of moneymaking with views, it was emphasized, was to canvass their territory thoroughly—exhaustively. It was easier to build up the order if many of the customer's neighbors were taking views. They were advised not to be easily put off as "NO, is not always an answer in canvassing any more than in courting. Persistence wins the day.

The manual also offered advice on how the agent should conduct himself while on the road. They 'were admonished to find a good boarding place, keep the

best of company and not talk politics and if a Christian, to go to church Sunday and make themselves at home in prayer-meetings or the Y.M.C.A. rooms. To be neat and clean in attire, to dress well and never boast of his business, only talking about his views when actually canvassing. (No mention of female agents has been found.)

When delivering the scope, it was important to once again get the customer seated to try it out. Views were shown in the same manner as when canvassing, having the customer decide on each view separately, laying aside those they wanted to keep. If the customer protested: "Oh, I have more than I can take now;' the agent replied: "Why this is only a start—you have an opportunity to obtain the finest views that have ever been made and it will pay you to take advantage of it and get a good collection. Your scope is not so interesting without a nice collection. The more you get the better:' The agent was reminded not to lower prices as that lowered the value of the goods in the minds of the patron. However, to clinch a large sale, the agent would offer a free stereoscope with an order for six dozen or more views!

In addition to their first class views, the agents carried a small number of copied views that they sold for three cents each. The purpose was to counter the customer's objections that they could buy views cheaper elsewhere and to prove the superiority of their more expensive views. By downgrading these views with the comment: "These are copies. We carry them only for a cheap class of trade;' they seldom had to show them. They also carried hand painted views and French transparencies with them that sold for 25 cents each.

Using these successful methods, Bert expanded their sales force into western Iowa, Nebraska, Dakota and Minnesota throughout 1884. At the same time, Elmer built the business in eastern Iowa, Illinois and Wisconsin. By the end of the year, they covered Kentucky Tennessee, Arkansas and Louisiana with their agents.

The following year, Elmer worked his way east into Pennsylvania and in a year and a half built the foundation of an immense business through the populous eastern and southeastern section of the country. Meanwhile, Bert crossed the Rockies, covering the Pacific Coast, from San Diego to Puget Sound, with agents.

The Underwoods claimed to have sent out 3,000 college students in one summer. Agents traveled by bicycle, or horse and buggy in farm country, and were sometimes invited, to spend the night with their last customer, paying for their room and board with stereo views. A few agents used their experiences with the Underwoods to go on to bigger and better things. One was James M. Davis, who became the exclusive Sales Agent for Kilburn stereo views. Another was B. L. Singley, founder of the Keystone View Company of Meadville, Pennsylvania. Keystone, in time became a strong competitor to the Underwoods.

Outgrowing their single supply house in Ottawa, Kansas by 1887, they opened an office in Baltimore to supply all the territory east of the Mississippi. That same year they also secured control of the stereo views produced by Strohmeyer & Wyman. The combined capacity of their four suppliers, Bierstadt, Jarvis, Littleton Views, and Strohmeyer & Wyman was ten million stereo views per year. A Canadian office was opened in 1888 to handle the large sales there.

Underwood and Underwood expanded into Europe in 1890 when Bert opened a branch in Liverpool, England. He personally ran the office for three years, creating a renewed interest in stereo views there. They moved their Baltimore office in 1891 to New York to better serve their growing sales overseas.

By 1894, they were selling their views wholesale or through agents in all European countries, Australia, New Zealand, South Africa, India, Japan, Cuba, Mexico and nearly every country in South America. In that year, the Underwoods shipped three million views to England retailing them for $2.00 a dozen. 160,000 stereoscopes were also sold there for $1.00 each.

Gradually the Underwood firm began to publish their own original views to supplement already established trade lists of their four suppliers. In 1891 Bert took lessons in photography from M. Abel in Mentona, France. The excellent travel views of Italy Greece, the Holy Lands and Egypt, published under the U&U label, all were produced from Bert's negatives.

While in Rome, Bert arranged to photograph Pope Pius X in stereo, producing a 12 card set on "The Pilgrimage to St. Peter s and the Vatican:' After presenting a set to His Holiness, the firm received the following note from a Cardinal at the Vatican:

> His Holiness Pope Pius X., wishes me to tell you how much He had admired the stereoscopic views which Messrs. Underwood & Underwood have kindly presented to Him. As a token of His special appreciation of these very interesting photographs, His Holiness bids me send you in His name a silver medal together with His thanks.

It was not until 1897 that the company supplemented Bert's work by employing their own full-time photographers and using free-lance operators for specific assignments.

By 1901, the firm had finalized the design of the U&U logo on their stereo views and were publishing over 25,000 views a day of their own. They also sold 300,000 stereoscopes a year—a prodigious output that made the firm the largest of its kind in the world. Their stereoscope supplier was Henry E. Richmond, a native of Bennington, Vermont, who had established a

stereoscope factory for the trade around 1890, in the small town of Westwood, New Jersey, population 838. The factory was just fifteen miles from mid-town Manhattan and employed about thirty people. His factory ground the lenses, cut out the wooden parts, stamped and shaped the aluminum hoods, binding the edges with velvet. Those he made for the Underwoods were stamped on the hood with the words "Sun-Sculpture" surrounded by their rising sun trademark. The factory was a two-story building with a water tower that supplied water to the town of Westwood. U&U apparently bought the factory around 1901 and retained Richmond as their Manager through at least 1914.

They also purchased a factory from Strohmeyer & Wyman in Arlington, New Jersey, eight miles from Manhattan, that produced both stereoscopes and views. Seventy persons were employed there in 1906. One of the Underwoods' more famous staff photographers, James Ricalton, was from Maplewood, New Jersey, just a few miles from their factory in Arlington. Their Westwood factory produced stereoscopes exclusively, employing 10 men and 20 women the same year.

At the turn of the century the Underwoods introduced their unique boxed set of views—a sequence of views that simulated a tour of the country depicted. Some views had captions in six languages printed on the back. A descriptive guidebook accompanied the views which included a map showing the exact location and boundaries of the views in the set.

U&U Guide Books were edited by some of the most eminent scholars of the day. The popularity of these travel sets and guidebooks made it difficult for smaller companies to compete and was responsible for some of them closing up shop and selling their negatives to the Underwoods, which grew even bigger as a result. Their boxed sets and books became immensely popular, forming the bulk of their output for the next 15 years. Their sales literature pointed out—"The Underwood Travel System is largely mental. It provides Travel not for the body, but for the mind- but travel that is none the less real on that account. It makes it possible for one to see as if one were present there in body—in fact to feel oneself present—and to know accurately famous scenes and places thousands of miles away without moving his body from his armchair in his comfortable corner; indeed, it enables him to take up one standpoint and then another with reference to them and so see them as a whole, and to study them minutely just as one would on a visit to the places in the ordinary expensive way."

By 1910 they had 300 different stereo view sets for sale and had diversified into the new field of News photography. As stereo views declined in popularity their News Division grew. They ceased production of all stereo views in 1920, selling their stereo negatives to the Keystone View Company which continued to produce Underwood inspired travel sets, primarily to schools. Shortly after the Underwoods retired, the company was reorganized as Underwood & Underwood News Photos, Inc. In 1943 Bert Underwood died in Arizona. Four years later, Elmer died in St. Petersburg, Florida.

Since 1978, much of the Underwood and Underwood archives have been housed within the University of California Riverside (UCR). This is as part of a 30 ton collection of 350,000 original stereoscopic negatives, 140,000 cards, record books, and salesman cataloques, primarily from Underwood and Underwood, The Keystone View company, B.W. Kilburn, H.C. White, and The American Stereoscopic company.

Underwood & Underwood images are a vast and invaluable resource showing the modernization of the world, brought to life by the power of Stereoscopic viewing.

DAVID BURDER

See also: Markets, Photographic; Stereoscopy; and Topographical Photography.

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UNION CASES

Union cases are plastic photographic cases made during the 1850s and 1860s primarily in the New England section of the United States and used to house daguerreotypes and later, ambrotypes. Made from the earliest form of plastic, or composition, the case material consisted of shellac and pulverized wood fibers (sawdust) which, when thoroughly mixed and sufficiently heated, resulted in a thick-flowing malleable substance. This substance

was pressed into molds which had die-engraved designs. The lid and bottom of each case were held together with metal hinges. "Union" cases were so named because of the combining of materials to produce a new substance, the earliest plastic.

From its inception daguerreotype was immediately popular in the United States and the demand for these portraits was overwhelming. In order to protect their delicate surfaces, daguerreotypes were, at first, placed under glass and fitted into wooden frames. A much more popular and portable method of protecting daguerreotypes was the use of the jewelry case, following the fashion established for portrait miniatures. As the production of daguerreotype images dramatically increased, so did the demand for cases to house them. Throughout the 1840s and early 1850s photographic cases were generally designed as shallow wooden boxes covered with thin sheets of leather or pressed paper to simulate leather.

The plastic photographic case industry began with the Scovill Manufacturing Company of Waterbury, Connecticut, and the daguerreotypist, Samuel Peck. The Scovill Company, a partnership between brothers James M.L. Scovill and William H. Scovill, was one of the earliest brass manufacturing companies in America. They had experience in making rolled plate metal, including silver plated copper sheets. One early supplier for cases to the Scovills was Samuel Peck of New Haven, Connecticut who began his career as a daguerreotype artist in 1844. By 1850 he was manufacturing cases and soon began a co-partnership with the Scovills that was named Peck and Company. In addition to leather and paper cases, Peck began creating "fine cases" including those made from papier-mâché. Perhaps it was the technique used in making these cases which inspired Peck to his greatest innovation. By May of 1852 Samuel Peck and his brother-in-law, Halvor Halvorson began producing daguerreotype cases molded from plastic.

Another important early plastic case manufacturer was Alfred P. Critchlow, a button maker from Haydenville, Massachusetts. Critchlow moved to Florence, Massachusetts and soon began experimenting with steam presses to mold shellac and gutta-percha compounds. He was producing plastic daguerreotype cases as early as 1852, soon after Peck began his work. Critchlow entered into partnership with Samuel L. Hill and Isaac Parsons in 1853; this new company issued a line of standard size cases, from which dozens of different designs have been identified. Beginning about 1857 the photographic supply firm of Holmes, Booth and Hayden in New York City were also actively engaged in plastic case manufacturing.

Great Britain was an early market for American made union cases, especially those with a distinctly British appeal such as "Sir Henry Havelock," "The Calmady Children," "Sir Roger de Coverly," and "The Highland Chief." Peck cases were being used there soon after their introduction in America. John Atkinson and Elisha Mander were two importers of these cases based in Liverpool and Birmingham. Some union case examples found in Great Britain have labels which read, "Patent American Union Cases." These were sold by Mander and were probably re-labelled for his market in cases made by Littlefield, Parsons & Co. or Critchlow. At least one firm manufactured union cases in Britain in the early 1860s—John Smith of Birmingham. The rare ninth-plate case, "Amazon on Horseback Being Attacked by a Tigress," was probably created by his firm, although none of the known examples carries a trade label. The dramatic design was based on the sculpture of the same name by Auguste Kiss which was a major attraction at the Great Exhibition at the Crystal Palace, Hyde Park, in 1851. Brookes and Adams were two die engravers who created case designs for the British market. Of major significance are two British patents made by John Smith for a thermoplastic mixture "...capable of being used for jewel cases, photographic cases, and 'horn' buttons in a variety of colours." The influences of this relatively small group of British dealers and manufacturers were important to a market which had been exclusively American.

Union case designs range from traditional subjects, such as patriotism and religious sentiment, to scenes from romantic literature, children's stories, mythology, and classical allusions, as well as vignettes of Victorian domestic life. Patriotic designs include "Shield with Flags, Cannons, and Liberty Cap," "Union and Constitution," "The Eagle at Bay," and "Constitution and the Laws." Religious motifs decorate "The Lord's Prayer," "Daniel in the Lions' Den," "The Holy Family," "Rebekah at the Well," and "The Church Window." Children's stories and Victorian sentiment were especially popular design themes with titles such as "Bobby Shafto," "See Saw, Margarey Daw," and "The Faithful Hound." American history theme cases include "The Landing of Columbus," "The Sweet Potato Dinner," "The Capture of Major André," "The Warning at the Green Spring," and "The Washington Monument, Richmond, Virginia." Many of these designs were based on prints, paintings, sculptures, and other works of art. Some die engravers were completely faithful in their translations for case designs, such as Smith and Hartmann, who copied Emanuel Leutze's epic painting "Washington Crossing the Delaware" in almost precise detail. Geometric, scroll, and floral designs were also used extensively on union cases—about 70 percent of all case designs. Plastic, or union, cases were manufactured in several standard sizes from the largest whole plate size (7 3/8" x 9 3/8"), half plate (5" × 6 3/8"), quarter plate (4" × 4 7/8"), sixth plate (3 ½" × 3 ¾"),

ninth plate (2 ½" × 3"), sixteenth plate (2" × 2 1/8"), and "sweetheart" (1 ¾" diameter) and came in several shapes, rectangular, octagonal, oval, and circular. Colors were at first limited to black and brown, ranging from a very light, almost tan shade to a dark, lustrous chocolate brown. Not until the late 1850s did union cases appear in colors other than these standard two. Small cases, usually ninth, sixteenth, small ovals, and the circular "sweetheart" cases were produced in a variety of colors including orange, red, and green.

Between 1853 and the mid-1860s, hundreds of thousands of union cases were produced to meet the demands of the rapidly growing photographic market. By 1857, with the advent of paper photographs which did not need to be protected in cases, the union case industry suffered its decline. The 1870s witnessed the disappearance of the cased image—both the daguerreotype and ambrotype processes were obsolete. Case manufacturers found new uses for thermoplastic and manufactured buttons, belt buckles, jewelry, combs, knife handles, chessmen, mirrors, gun cases, brush handles, picture frames, and lids for men's collar boxes, some using union case designs.

Union cases were America's first plastic products—the very beginning of a significant industry. Used as a protective device for the popular daguerreotype, union cases became artful objects in their own right and are collected today for their wonderful and intricate designs.

MICHELE KRAINIK

See also: Mounting, Matting, Passe-Partout, Framing, Presentation; Daguerreotype; Scovill & Adams; and Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851).

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UNIONS, PHOTOGRAPHIC

The need for a 'photographic union'—an association designed specifically to offer support to professional photographers—manifested itself in some regions of the world much earlier than others. Despite early photographic societies and groups declaring themselves to be open to all who had the interests of photography at heart, it very quickly became apparent in some countries that the needs, motivations and intentions of the amateur and the professional were distinctly different.

Though the initial spread of the daguerreotype in the United States was largely spontaneous and unorganized, after 1850 various factors such as increased competition, questionable patenting of minor improvements (such as a bromide coating of glass plates) and the rise of the negative processes led to several attempts at uniting professional photographers on a "protective" or "fraternal" basis. In 1851 were formed the first two American photographic societies, which were closer to being unions than their French and British counterparts: the New York State Daguerrean Association thus aimed at setting floor prices, while the American Daguerre Association sought to vindicate the profession from its "humbug" reputation. These short-lived organizations, and their immediate followers, also resembled earlier artistic unions in providing for "mutual aid." This professional concern was less prominent in the formation of the American Photographic Society in 1859, which emphasized larger, social and cultural goals. Hence the creation of a Photographers' Protective Union in 1860 and the ongoing battle, in the 1860s, to repeal the infamous "bromide patent," a goal that was finally achieved in 1868. In 1869 was formed the National Photographic Association, the first "fraternal" organization of professional photographers to remain stable and to combine mutual aid and a concern for the elevation of pictorial standards, as shown in its annual exhibitions until 1900. The 1870s and early 1880s were thus a period of relative stability, though early photographic giants such as the Anthony and Scovill companies had come to control large sectors of the photographic market, bypassing professional organizations. After 1890, the rise of popular photography, embodied in the phenomenal growth of the Eastman Kodak Co., threatened to relegate the old professional and fraternal pattern to marginal status, while a new industrial framework emerged that had little tolerance for workers' unions.

In Europe, Julius Schnauss founded the *Allgemeiner Deutscher Photographen-Verein* in 1858, and went on to edit its journal, *Photographisches Archive*, while Ernest Mayer of Mayer Freres et Pierson in Paris, founded the

Union photographique in 1859 as a mutual aid society for the protection of workers engaged in all aspects of professional photography.

Very little is known about the situation of the majority of photographic workers in 19th century Europe. Most photographers were artists or craftsmen, and their studios employed just a few assistants in setting up chemicals, carrying equipment, or retouching the results. Larger studios began to employ women for greeting the clients when entering the rooms. Social problems arose with the establishment of larger companies and studios after the introduction of the carte-de-visite and stereo cards.

Workers at lithographic establishments such as Hanfstaengl in Munich or Roemmler & Jonas in Dresden organized themselves in printers' unions but because of the nature of their operations, photographic workers had little or no access to such organisations. Membership of many of the early mutual aid societies was restricted to studio principals—the photographers themselves—with little or no protection available to their workers.

About 1865, twenty Danish professional photographers formed themselves into a professional association—the first such organisation in that country—but like so many early attempts at the formation of trade associations, it was relatively short lived.

In 1870, there was an "Association of Photographic Operators" (Photographischer Gesellenverein) founded in Berlin, and in 1885 there was a branch set up in Dresden, in 1887 as well in Chemnitz and Munich. In 1891, authors of a meeting's report hastened to tell the public that they had 'eliminated all socialist elements' from their organisation, and in 1898 a Viennese association of operators had similar problems in distinguishing themselves from workers' unions.

As many photographic assistants worked in large printing offices they found themselves organized as printers by the late 1860s in Italy, France, Switzerland, and Austria, to be followed by Germany in the late 1870s. Lithographers became well organized after the invention of the autotype process both in Germany and Austria, and it is likely that numbers of practitioners went under the shelter of their union by this time.

Britain was very slow to adopt the idea of a trade association or union for photographers and photographic workers. From the 1850s, organisations such as the Photographic Society and the Architectural Photographers Association (later the Architectural Photographic Society) were open to amateurs and professionals alike—the criteria for membership focusing on the 'gentleman photographer' rather than the staff who worked behind the scenes. So the negotiations with Talbot over the restrictions imposed by the calotype patents were conducted through the Photographic Society rather than by any professional grouping.

It was the 1880s before an exclusively professional association was first mooted in Britain, and 1890 before a trade union for photographic assistants came into being—the same year that the Photographic Manufacturers Association was formed. A busy year for the formation of specialised groupings, 1890 also saw the establishment of the Society of Professional Photographers (quickly renamed the National Association of Professional Photographers) towards the year-end. None of these groupings endured—the NAPP folding by 1898—and a Master Photographers Association enjoyed only a very brief existence during the 1890s. It was 1901 before the Professional Photographers Association (now the British Institute of Professional Photography) came into being. That association continues today.

In the southern hemisphere, the distances which separated areas of photographic activity dictated that local rather than national associations were established.

The earliest professional photographic group in Australia was the Photographic Society of Victoria, formed in 1860, which held meetings at the studio of Batchelder & O'Neil at 57 Collins St. Melbourne. The secretary was Charles Hewitt. In 1894, the Professional Photographers Association of Sydney formed, meeting in the Sydney School of Arts with J. Hubert Newman as Chairman, and a state-wide group, the New South Wales Professional Photographers Association formed in the same year, holding meetings at the Baker & Rouse Warehouse in George St, Sydney.

The Photographic Association of South Australia was formed late in December 1882 and the first meeting was held at George Freeman's studio in King William Street, Adelaide where it was reported that twenty-four persons had sent in their names for enrolment, but the group was short lived.

The South Australian Photographic Society first met 14 August 1885 at Chairman Aaron Flegeltaub's office in Freeman Street, Adelaide, catering for both professional and amateur photographers, while in Queensland the Professional Photographers Association formed in Brisbane in 1893 with Gustave A. Collins, operator at the studio of Albert Lomer & Co, as president.

François Brunet, John Hannavy, Rolfe Sachsse, Marcel Safier

See also: Daguerreotype; Anthony, Edward, and Henry Tiebout; Scovill & Adams; Kodak; Cartes-de-Visite; and Calotype and Talbotype.

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UNITED STATES OF AMERICA

In view of photography's extraordinary development and deep assimilation in the United States, it has been suggested that although it originated in Europe, it should really have been invented in the U.S. Such a claim could hardly be justified on mere technological grounds, since by all accounts there were few, if any, serious precursors in the U.S., and since the American contribution to photographic technologies was minor, at least until the emergence of dry plates and popular photography after 1880. Similarly, the artistic achievement of 19th-century American photographers, at least until the 1890s, has often been regarded as secondary in comparison to that of leading European countries, although since 1975 or so a few American "masters," such as Edward S. Curtis or Carleton E. Watkins, have received increasing attention. If one is to uphold the idea of a special success of photography in the U.S., then it must be understood less in the traditional categories of science and art, and more in terms of social, economic, and cultural development, as was already made clear in Robert Taft's pioneering history of American photography, published in 1938 under the significant title *Photography and the American Scene: A Social History, 1839–1889*.

Social history, in a broad sense, has been a continuing trend in the ever-increasing historiography of 19th-century American photography since Taft, and it has been important not only in unveiling previously unknown or underestimated American photographers and pictures, but more generally in stressing social patterns of practice, use, and appreciation. These patterns were doubtless more pronounced or more noticeable in the U.S. than elsewhere, but they were by no means unique to the U.S. In that sense, the social bend of much of American historiography has served in recent years as a model for other areas, especially Europe, where the social dimension of photography had often been eclipsed by a more narrowly academic historiography. The following presentation, while arranged in broad chronological fashion, will focus on the connections between photography and society, which in the case of the U.S. determined the course of photography as a medium of culture and memory, rather than a mere form of art.

Most accounts of the beginnings of photography in the U.S. have emphasized the sweeping enthusiasm of Americans for what Oliver Wendell Holmes called "the mirror with a memory," i.e., the daguerreotype, which was the sole process being practiced in the 1840s and which was dominant until 1855 at least. This enthusiasm was reflected in countless press articles and other records, starting with Samuel F.B. Morse's famous description of Daguerre's "results" in a letter he sent his brothers from Paris in March 1839, and which was subsequently published in dozens of American newspapers. According to the American painter-inventor, Daguerre's plates were "Rembrandt perfected," and "their exquisite perfection almost transcend[ed] the bounds of sober belief." A few months later, Edgar A. Poe hailed the daguerreotype as "the most important, and perhaps the most extraordinary triumph of modern science," while Ralph W. Emerson, noting the sobering effect of a daguerreotype sitting, wrote in his journal that "a Daguerreotype Institute is worth a National Fast." Many more examples of this enthusiasm could be adduced, especially from the scientific, literary and artistic milieus, which almost unanimously embraced the daguerreotype and in many cases kept abreast of improvements. What was perhaps most distinctive about the American response, however, was not its superlative and sometimes fantastic character, but its primarily social and technical dimension, which quickly transformed the foreign invention, its use and its practice, into a booming profession and something of a national pastime. It would be exaggerated to claim that the beginnings of photography in the U.S. amounted to a rush of entrepreneurs and fortune-seekers, as opposed to the genteel world of *savants* and *artistes* supposedly typical of European countries. Many of the early practitioners and promoters of the daguerreotype in the U.S., notably in New York, Philadelphia and many other cities, were artists, such as Morse, whose studio served in 1840 as a school for many a future great of American photography, including Mathew B. Brady, Edward Anthony, and Albert S. Southworth. Most American painters of the mid-century would experiment in one way or another with the daguerreotype and then with other processes. One must not overlook either the initial role of professional scientists, such as the leading chemist and colleague of Morse at New York University John W. Draper, the University of Pennsylvania chemist Paul Beck Goddard, and the future president of Columbia University

Frederick A. P. Barnard; in addition, the development of the daguerreotype in smaller cities, such as in the South, was often led by local academics or physicians. It is clear, however, that these beginnings were less academic and more professional than in Europe, and that they took place mostly outside established institutions, or rather that those academic institutions that did play a role (such as the American Institute, the Franklin Institute, or even the American Philosophical Society) were at the time too insignificant or too weak to exercise any kind of control or even any major influence over the course of events. Thus, what is striking about Morse's letter of March 1839 is not just its fantastic style, but rather the fact that this private letter, full of emotional marvelling, and necessarily devoid of any proof or illustration, was reproduced in hundreds of newspapers and served as the nearest equivalent of an official annoucement of the daguerreotype in the U.S. In contrast to the ceremonious and centralist rituals that surrounded the invention in France, the spontaneous and diverse beginnings of photography in the U.S. were auspicious for an invention that was to become a "mirror image," in Richard Rudisill's phrase, of political and cultural democracy—so much so that by the 1850s many an American journalist would claim that "photography was born in the U.S."

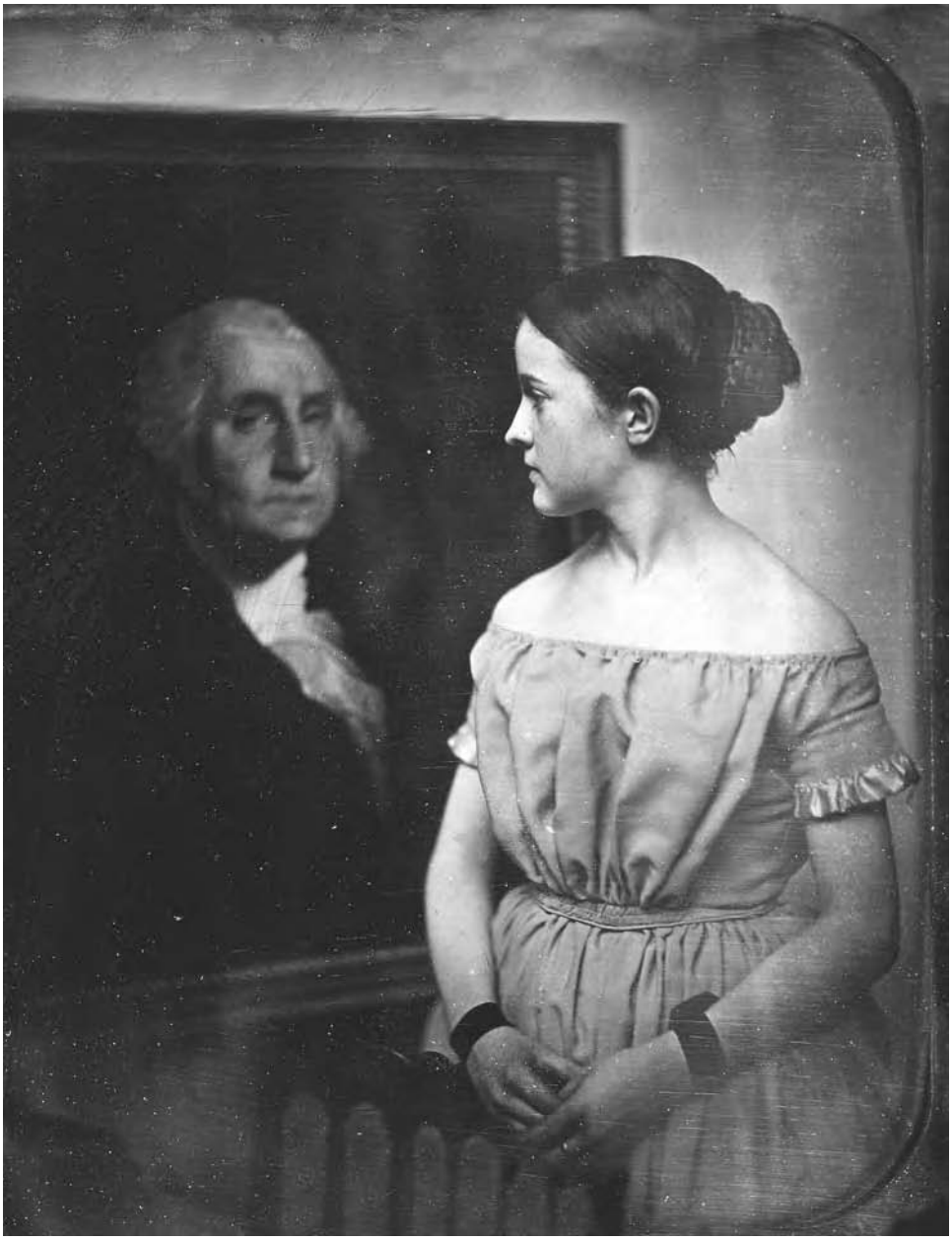
The fact that Daguerre did not take out a patent in the U.S. was a major factor in the daguerreotype's long domination; its development, however, took almost immediately a decisively technical and professional turn. Virtually every effort of the pioneers centered on the drive to make portraits and to make a business out of them, and this soon led to the registration of many patents for technical improvements. Whatever the answer may be to the much-debated question of the "first photographic portrait," and while European experimenters were also involved in 1839–40 in research aimed at reducing exposure time and increasing light input and chemical sensitivity, such research mobilized more energy and ingenuity, and yielded quicker positive results, in the U.S. than anywhere else. A classic example of this American specialization is the short career of the Wolcott-Johnson partnership, which in October 1839 created and soon patented, for the purpose of making portraits, a simple design of a camera without a lens, and used its superior luminosity to open in New York, in May 1840, the world's first studio for photographic portraiture. While Wolcott also designed many recipes for "accelerating" silver salts and more generally reducing exposures, many more examples could be adduced of early and continuing American experiments that almost always touched upon the technique of making portraits, including its more artistic aspects such as lighting, background, and the expression of the sitter. Between 1839 and 1845 at least, portrait-making was virtually the sole photographic activity practiced in the U.S., and after that it remained both the most important and the most prestigious branch of daguerreotypy, as illustrated by many an enterprising "daguerreotype institute" (such as the network of studios owned by the Bostonian John Plumbe), and, most famously, by Mathew Brady's Broadway studio. Brady's "Gallery of Illustrious Americans," which became something of a household word in the 1850s, especially exemplified the link between photography and the building of a national identity, as well as the connection that the portrait always suggested between one's image and the public image of celebrities functioning as models. Well beyond the daguerreotype era, indeed for the entire 19th century, portrait-making would remain the dominant use of photography, feeding a profession which, as early as the 1840s, emerged as unrivalled in size, dynamism, and business.

The unique success and durability of the daguerreotype process in the U.S. can be measured by the fact that both in quantitative and qualitative terms it reached its climax after 1850, rather than before, and that it remained dominant until 1855 and widely practiced until the early 1860s, thereby departing radically from the general course of development observed in Europe. Thus in 1851 at the London Crystal Palace Exhibition, Americans showed nothing but daguerreotypes and indeed won several prizes for them: a first prize to Martin M. Lawrence for stylish and allegorical portraits, a second prize to Mathew Brady for his portraits of celebrities, and another second prize to John A. Whipple for his daguerreotypes of the moon. At the 1853 New York Crystal Palace Exhibition, daguerreotypes were still largely dominant, although for the first time the top award went to paper photographs. The years 1850–1853 were the peak of a kind of Daguerrian cult in the U.S., with the publication of the world's first specialized journal under the title *The Daguerreian Journal* (founded in November 1850 by Samuel D. Humphrey); the creation of the first two professional associations, namely, the New York State Daguerrean Association and the American Daguerre Association; and, in the same year, 1851, which saw the death of Daguerre and an emotional homage from the American profession to the "French master," the building of a huge photographic manufacturing complex on the Hudson under the name Daguerreville. According to sources quoted by Taft and other historians, in 1853 the number of daguerrian establishments in New York exceeded one hundred, which is twice as many as the figure known for Paris in 1848, and the annual production of daguerreotypes in the U.S. was estimated at three million; between 1850 and 1860, the national census recorded an increase from 938 to 2650 daguerreotypists, while the 1860 census also registered a new category of "photographists" with a population of 504, probably an underestimation since by this date

many daguerreotypists were also practicing photography on glass. By 1855–1860, every town of any significance and many a tourist spot or place of passage had at least one resident photographer, and the itinerant "dag'typist" with his wagon and chemicals had become a familiar feature of the countryside.

The daguerreotype boom of the 1840s and early 1850s was sustained by a climate of "near-perfect competition" (Reese V. Jenkins) that was facilitated by the quasi-absence of commercial restrictions on the practice. This situation changed with the advent of negative-positive processes, which made it possible for some individuals, notably one James A. Cutting, to take out patents on minor improvements with a view to controlling the entire market of glass-plate photography. The "Cutting patent" or "bromide patent," awarded in 1854 for the use of potassium bromide in combination with collodion on glass, enabled its holder to exert durable financial pressure on many practitioners, until it was repealed in 1868 upon an application to renew it. More generally, the 1850s and 1860s witnessed a greater diversity of processes, as well as the emergence of cheaper variants (such as the "ambrotype" and its more popular version, the tintype, which as a pseudo-positive process on a dark metal base continued the daguerreotype model in the U.S. and remained hugely popular throughout the 19th century) and mass-market picture products (such as the carte-de-visite and then stereophotographic views). These cheaper, more common types of pictures gradually transformed an activity that had been largely a craft into a more industrial and more aggressively commercial business. Thus, this period was marked on the one hand by the rise of larger suppliers or brokers and a few dominant picture-making firms (the most important being the Anthony brothers' company in New York), and on the other by a spirit of suspicion and bitter rivalry among the more isolated individual photographers, leading to countless efforts, between 1850 and 1870, to organize the profession (see entry "Societies, groups, institutions, and exhibitions in the United States"). The atmosphere of defiance and the absence of a strong organizational framework was illustrated by the famous affair of the "hillotype," an alleged process for color daguerreotypes which the Reverend Levi Hill claimed to have invented, but which could never be either proved or disproved, despite a protracted investigation and major turmoil in the photographic profession in the 1850s.

Meanwhile, by 1860, it can be said that photography had become part of American culture at large. Even though the prices of full-plate daguerreotypes had remained too high for most people to afford them, the carte-de-visite, the tintype and the stereoview gradually turned the experience of photography into a common one, and allowed large segments of the population to own at least a few pictures. These would of course be portraits for the most part, and the more privileged individuals and families who had started accumulating daguerreotypes in the early 1840s were already, by 1860, enjoying the later popular ritual of viewing the growth of children, family resemblances and more generally family history through the photo-album. This photographic construction of family memories was already commented on by Oliver W. Holmes in his famous articles on stereoscopic photography, which appeared between 1859 and 1863 in the *Atlantic Monthly*, and which also indicated the emergence of a cultural consumption of images of the world in the upper, educated classes. For indeed, besides portraits, an increasing share of photographic production in the 1850s illustrated aspects of public life and national culture, from portraits of statesmen and artists that were reproduced as engravings to views of prominent buildings, city scenes, and some already well-established tourist sites (such as Niagara Falls), which would be made popular mostly by stereo-views. Many burgeoning American cities of the antebellum period were illustrated by photography, sometimes in a very self-conscious way, as in the case of Cincinnati (a stunning multi-plate daguerreotype panorama of which, by Charles Fontayne and William Porter, had won a prize at the Franklin Institute in 1849) or especially San Francisco, which almost from its very inception as a city cultivated a kind of photographic narcissism (with views by George Fardon, Charles L. Weed, and then Carleton E. Watkins and others) that would only expand in the 1860s and 1870s; in later years, the rise of Chicago as a metropolis was similarly documented almost day to day by photography. The 1850s and early 1860s also saw the first significant examples of landscape and survey photography, in California especially, but also in the Philadelphia area, although this trend really picked up force only after 1868 or so. Although still timidly, some Federal and state institutions, such as the Department of Treasury for instance, started to use photographers, as did also some large-scale expeditions such as Colonel John C. Fremont's fifth expedition across the Rocky Mountains in 1853 (daguerreotypist Solomon N. Carvalho) and Commodore Mathew Perry's inaugural voyage to Japan in 1852–53 (daguerreotypist Eliphalet Brown). The idea that photographs carried a memorial and documentary value, and therefore could produce a new kind of archive, was making its way into many corners of society. Although American scientific institutions were typically slow and reserved in this process, the 1850s and 1860s saw some attempts at building up collections of ethnographic photographs, in a few cases of African-American slaves and, through the practice of some Washington, D.C., photographers (such as Zeno Shindler), of Indian representatives on delegation visits. Thus, the earliest significant bodies of images of minority groups in the U.S. came into being



Southworth, Albert Sands and Josiah Johnson Hawes. Young Girl with Portrait of George Washington.
The Metropolitan Museum of Art, Gift of I.N. Phelps Stokes, Edward S. Hawes, Alice Mary Hawes, and Marion Augusta Hawes, 1937 (37.14.53) Image © The Metropolitan Museum of Art.

as a function of archival projects. The political world itself began during the 1850s to realize the impact of photography as a means of publicity and emotional effect; this is how, during the 1860 Presidential campaign, Mathew Brady became "Mr. Lincoln's camera man." Finally, the new cultural role of photography in American society was recorded in much writing of the time, from Nathaniel Hawthorne's *The House of the Seven Gables* (1851), the first major piece of fiction probably anywhere in the world to stage a photographer (in this case a daguerreotypist) as a protagonist, to dozens of more popular novels, tales and stories exploiting the supposed "mysteries of the darkrooms" and the magic powers of the camera, and to the more philosophical reflections of Emerson, Holmes, and others; around 1860, Walt Whitman had become the first major public image of a writer through photography.

These various trends truly gained full force during and immediately after the Civil War, as the glass-plate, negative-positive processes finally superseded the daguerreotype, now making the multiplication of prints a defining aspect of photographic practice and business. The Civil War itself provided direct and decisive impetus for the suddenly accelerating spread of photography in American society and institutions. What is most obvious and most often mentioned in this connection is the outstanding and unprecedented body of thousands of photographs of the war that were produced by the hundreds of photographers associated with the Union army, many of them in the employ of Mathew Brady (such as

Alexander Gardner, Timothy H. O'Sullivan, George N. Barnard): camp scenes, army group portraits, but also the first "straight" photographs ever of war casualties and destruction, among which the most famous one is probably O'Sullivan's "A Harvest of Death," a view of Union soldier corpses left lying at the battlefield of Gettysburg. Here were, to quote Gardner's words in his *Photographic Sketch Book of the Civil War* (1865), the "dreadful details" and the "blank horror" of war: these pictures indeed clashed with the traditionally staid pictorial representation of war, and inaugurated a tradition of war reportage, and of reportage in general, that would be durable and especially strong in American photography. The unique photographic documentation of the war that was thus collected—mostly, once again, from the Union side—has become a major document of American history. Along with various technical uses of photography for map-making, reproduction and filing that the military itself promoted, it has often been cited as one of the illustrations of the Civil War's "modern" dimension. But there were other aspects as well, although often overlooked. First, the war affected virtually every American family, and it tragically strengthened the desire of relatives to remain linked to their boys by getting their pictures, and of soldiers to keep a remembrance of home, peace and family ties through the carte-de-visite portraits of loved ones they kept in their wallets. The production of photographic portraits during the war was enormous, and it was one of the immediate reasons why the armies—especially on the Union side—decided to allow and then to invite photographers among their ranks. Although from its inception photography had been especially linked with the keeping of family portraits and especially the commemoration of the dead, the Civil War more than any other single event made photographic portraits a part of American life. And it was after the Civil War that increasing numbers of ordinary American citizens, including a large number of women (who have more recently been brought to our attention), took up photography either as a business or as a hobby. Second, the Union Army's involvement with photography and photographers precipitated, in the wake of the war, its inclusion in virtually every sector of scientific, museal, documentary and more generally institutional activity in the U.S. It was after the war, and often as a direct result of Army staff connections with photographers, that many new or preexisting institutions started to use photography and to hire photographers on a more or less permanent basis. This was true with a number of medical, police, and other public institutions. But the most striking example of this phenomenon was the widespread use of photography and photographers in Federal surveys of the West between 1867 and 1880, which involved several veterans of war photography, such as O'Sullivan—who remained in Federal hire from 1867 to his death in 1881, and who is now the most valued and scrutinized of the survey photographers—and Andrew J. Russell, who after serving with the Quartermaster Corps went on to document the building of the Union Pacific Railroad line. Along with the spirit of conquest and colonization that characterized the post-war years, the Army's involvement with photographers thus paved the way, somewhat paradoxically perhaps, for the exceptional flourishing of documentary and landscape photography that took place in the West, under Federal direction mostly, around 1870. Beyond O'Sullivan, the survey photographers included, among others, William H. Jackson, another "grand old man" of American photography who recorded the first views of Yellowstone, the Mountain of the Holy Cross, Mesa Verde and many another of the "wonders of the West," and Jack Hillers, the photographer on Major John Wesley Powell's survey of the Colorado who almost singlehandedly created the photographic archive of Indians in the Bureau of American Ethnology. When looking at the sublime landscapes of California, Colorado, Wyoming, Idaho, etc., which were taken by these photographers in large, sometimes gigantic, collodion-coated glass-plates, one cannot but be struck at their magnitude as well as technical and artistic excellence. At the same time, however, one cannot either avoid the supposition that the Federal Government, by 1870, had found in the photography of the West's grand landscapes a perfect visual and even artistic expression for its policy of "reconstruction," i.e., a means of replacing the wounds of the war with visions of both a pristine Nature and a grandiose future in the imagination of Americans.

Many of these photographs, including especially hundreds of landscape pictures that basically defined the contours of the American imagination of the West and its great sites, were exhibited and rewarded in several important exhibitions, including the World Fairs of Paris in 1867 and Vienna in 1873, as well as the Centennial Exhibition in Philadelphia in 1876. They were also distributed, along with many other similar pictures of private or corporate origin, in the form of stereoviews, which by 1870 had become the most important popular medium of visual information and entertainment. The railroad companies were especially active in promoting and selling landscape photography. The business of landscape views was between 1865 and 1890—aside from portraits—the primary channel of popularization of photography and photographs in American society, and it continually reemphasized the connection between the new medium—for photography was still considered such by the general public—and the new perspectives of American society. But it also served, although somewhat paradoxically, the recognition of photography as an art form. Because these views obsessively staged

the spectacular landscape forms of the West, and because their authors in general tended to underplay or perhaps to hide their stylistic input in them, they were generally regarded as anonymous "views of the West," notwithstanding the specialized interest of a small "photographically literate" community in their makers' idiosyncrasies. For that reason especially, as well as because of increasing acts of piracy and underselling, the more culturally conscious segment of American photography fought after 1865 for a legal recognition of their authorship, which resulted in 1868 in a modification of the copyright laws that provided some protection for authors. Thus, the same moment that witnessed the true popularization of photographic images in American society was also the time when the idea of photographic authorship gained a measure of recognition. This dual pattern was to maintain itself for several decades, as the social distribution of views expanded into the business of chromolithographs and then (after 1890) postcards on the one hand, and as more demanding artist photographers on the other hand devised stylistic and publishing means of distancing themselves from the mainstream. William H. Jackson, who after his survey years went into partnership with the railroads and then with the Detroit Publishing Company, was an example of the "commercial" model, as were also, in the last years of the century, Frank Jay Haynes and Adam Clark Vroman (although all three of these photographers at the same time practiced more advanced or formally innovative photography). Conversely, more sophisticated or more artistically ambitious individuals, such as Peter Henry Emerson, the founder of "naturalistic photography" in the 1880s, and his followers illustrated a more formally and intellectually demanding perspective, although they learned immensely, if not always admittedly, from the "view" or "business" photographers.

This latter trend, which led to the differentiation of "professionals" and "artists," was also a reflection of broader patterns after 1880, among which the most significant was the emergence of amateur photography and the ensuing transformation of the older forms of practice. Until 1880 or so, there were few amateurs in the U.S., and those who existed were for the most part the learned, high-profile type, engaging primarily in documentary endeavours. While the French law of 1839 on the daguerreotype had implausibly announced that with the daguerreotype, every one could make a picture, the democratic promise of universal access to picture-making had remained until around 1880 a fairly abstract notion, even though the possession of pictures had already been democratized. In fact, in the U.S. even more markedly than in Europe, the business of picture-making had been, almost immediately and durably, the exclusive privilege of a professional class, which prided itself on its technical achievement, and which because of its lack of reputation was especially prone to bar outsiders from entering the field. Photography until 1880 or 1885 remained, in Daniel J. Boorstin's phrase, "esoterical." But then after that things changed rather quickly, as dry plates, smaller formats, and the first attempts at providing photographic customers with technical services started to catch the fancy of the urban upper-middle class. By 1885 there were amateur photographic clubs in most leading American cities, and photography was becoming a fad along the same lines as bicycling or going to the beach. Then a new and decisive threshold was crossed with the introduction, by the Eastman Company of Rochester, of the first Kodak (1888–89), an easy-to-handle hand camera loaded with film (first mounted on paper, then on celluloid) for a hundred views, which after exposure the firm would take in and process for a relatively low cost : "you press the button, we do the rest," the slogan went, as if to materialize the promise of 1839. This slogan was successful enough to become a catchphrase of the 1890s, as thousands of Americans discovered the pleasures of snapshot-taking and thus constructing their own private memories, and as the Eastman Kodak Company kept introducing newer, simpler and cheaper models (such as the famous Brownie in 1900). The Kodak organization reflected the new potential of American industry for technological innovation, which around the same time was also embodied in the development of moving pictures. But the Kodak was primarily a concept, and although it had been preceded, and was largely imitated, by many competitors (such as Ansco, Carbutt, Cramer, etc.), it was a revolutionary one, just like its author George Eastman had intended it to be: for George Eastman had been perfectly explicit about his ambition to make "a Kodaker" of every American man, woman, and child, be it at the cost of displacing the former corporative privileges and organization of the professionals. Professional photography did not simply disappear around 1900, but it was progressively stripped of its basic functions and relegated to more specialized ones, such as ceremonial portraits on family occasions and the like. Meanwhile, much of the former public and commercial character of photographic practice was replaced by a new interrelation of industrial and domestic concerns, out of which, in addition, the amateur photographer now also started to evolve, at least in some cases, as a new type of artist. To be sure, serious amateurs and artist amateurs had been around, and had even formed clubs, for several decades before 1900, an early and important example being the Philadelphia Society, which starting in 1860 gathered around Edward L. Wilson and published a high-class periodical, *The Philadelphia Photographer*. But the boom of popular photography in the 1890s transformed the very concept of amateur, in the sense that being a popular photographer meant taking the kind of pictures

that a professional might have made before, although not necessarily with strong artistic consciousness. Finally, this process of popularization also coincided with, and in several ways underlay, the much more self-conscious efforts at distinguishing art photography from run-of-the-mill professional photography—as well as from "button-pressing"—by some advanced individuals, who since about 1885 had been advocating and practicing "pictorial photography," under the influence of P.H. Emerson, and British and other European artists and critics. The most notable example of the partition between "high-brow" amateur photography and popular photography was, of course, Alfred Stieglitz and his New York circle, which between 1892 and 1900 progressively broke away from the New York amateur clubs to create the Photo-Secession and the prestigious magazine *Camera Notes*. Stieglitz went on to found a distinctively American branch of photography—as well as modern art—on the premise that neither the limited, recipe-style, technical expertise of the professionals nor the haphazard and vulgar opportunism of the "button-pressers" constituted true photography. But at the same time, Stieglitz himself practiced the hand-held camera and other contrivances associated with popular photography, while also showing great meticulousness in his picture-taking choices, as well as in developing and printing procedures, and he thus served as the synthesis of the new diverging trends, and as an endpoint to several of the main traditions of 19th-century American photography. Ultimately, it may be argued that the American 19th century climaxed in the contradictory but complementary figures of Eastman and Stieglitz, who not only jointly revolutionized photography for the U.S. and for much of the world, but who paradoxically upheld some of the basic trends of the 19th century, most notably the profoundly political dimension that in the U.S. had attached itself to photography, making it the democratic art *par excellence*. This political dimension, indeed, was lost neither on Eastman nor on Stieglitz, both of whom viewed photography as the double expression of hard work and individual freedom.

François Brunet

See also: Daguerreotype; Southworth, Albert Sands, and Josiah Johnson Hawes; Draper, John William; Goddard, John Frederick; Brady, Mathew B.; Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); Wet Collodion Negative; Cutting, James Ambrose; Cartes-de-Visite; Stereoscopy; Watkins, Carleton Eugene; Weed, Charles Leander; and Fardon, George Robinson.

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URIE, JOHN (1820–1920)

John Urie was born in Paisley, Scotland, in 1820, the son of a weaver, and was apprenticed in the printing trade. In the 1840s he operated his own business hand-carving wooden type for use in the printing industry, and later working as a wood engraver making printing blocks.

Urie's engagement with photography was reputedly initiated by a visit to the Great Exhibition, and by 1852 he had established himself as a photographer in Glasgow.

In December 1852 he was mentioned in *The Practical Mechanics Journal* in connection with the application of photography to wood engraving.

By 1854 he occupied premises in Glasgow's Buchanan Street, at Nos. 33 and 35, producing portraiture. The *Mechanics Journal*, May 1854, published an account of Urie's *Relievotype* variation on the collodion positive, or ambrotype, in which the image was presented emulsion side up, with only the background of the actual portrait backed with black shellac. The image was then placed on a light paper or card background. This had the effect of creating a three-dimensional effect.

He later advertised studios in Edinburgh, Glasgow, Leeds, Perth, Dundee and Belfast and that he had 'agencies' in all important cities.

In 1885 he invented a photographic printing machine which could produce two hundred prints an hour by gaslight (*Photographic Times,* Nov 27 1885).

John Hannavy

V

VACQUERIE, AUGUSTE (1819–1895)

French photographer and writer

Auguste Vacquerie was a very close friend of the Hugos, who considered him as a member of the family. His brother Charles married Leopoldine Hugo, the writer's elder and beloved daughter. The consorts both drowned in the river Seine near Villequier, in 1843.

After a classical education, he turned to critique and journalismHe co-founded in Paris the political newspaper L'Évènement, with Paul Meurice, his good friend from College Charlemagne, Charles, and François-Victor Hugo. On the 2nd of December 1851, threatened as a republican and opponent to Napoleon's dictatorial regime, he left France. Later he moved to Saint-Helier, Jersey Island, with the two Adeles, the wife and daughter of Victor Hugo, who joined them in August 1852. They stayed there till October 31 1855, when they had to move to Saint-Peter-Port, Guernsey Island.

In Jersey, Vacquerie had to adjust to his new condition of exile, as well as the Hugo family. Far away from his busy social life dedicated to political and journalistic activities, he mainly turned to literature. But along with Victor Hugo, Charles and François-Victor, he was part of the Jersey et l'Archipel de la Manche book, a project launched by Victor Hugo, supposedly in two volumes. The first one, rather inexpensive, included poetry written by Victor Hugo himself. The second volume, more luxurious, was to include texts on Jersey's history and institutions, and photographs taken by the Hugos sons and Vacquerie. For him, this book was a rather basic work, far from the interest he had at this time in theatre plays. He hoped it would be an opportunity to make money quickly.

Vacquerie greatly admired Delacroix aesthetic and was influenced by the latter's concept of photography. Vacquerie mostly worked with negatives on paper, which offered more delicate contours. Yet, he used glass plates as well. Positives were printed on salted paper, a technique he seems to have learnt from Charles Hugo. Not satisfied with his first attempts, he worked hard on improving his technical skills, as witnessed by letters to his friend Paul Meurice or to his family (see unpublished letters to his mother, sister (Mrs Lefèvre) and nephew Ernest Lefèvre, kept at Musée Victor-Hugo at Villequier).

Auguste Vacquerie usually used small size prints (roughly 10×7 cm.), organizing his pictures with great attention to harmony, according to curves, light and shadow balances. Although it is hard to discern Charles Hugo's or Auguste Vacquerie's authorship when not clearly established, Vacquerie's portraits end-up as a remarkable set.

Beside Victor Hugo's portraits, he shot pictures of many exiled people there (like the Le Flô children or Augustine Allix) or visiting friends (Paul Meurice and his wife) that the corresponding French colony in Jersey still looks very vivid. Focusing on details, he brings to life the daily routine of the exile, like Mrs Hugo reading Châtiments dressed in a peplum-like drapery, and the passing of the seasons, pictured in close-ups of the green house sofa with hanging roses above or the garden under the snow. In his images, Vacquerie never parted from his own sense of humor: he pictured his cat sleeping as a pendant to a portrait of Hugo, during a reading of Phèdre tragedy.

Vacquerie also made as many as 43 self-portraits. These images show a clear influence of Victor Hugo's portraits: the poses are strikingly similar. Many of Vacquerie's self-portraits are grouped along with portraits he did of his family (his mother, sister, nephew, etc.) in an album he gave them (now kept at the Bibliothèque nationale de France).

Lastly, Vacquerie developed a clear interest in still life, a genre that set him apart from the rest of the Jersey Atelier and the Hugos' photographic production.

Through photographs of casual objects (like Mrs. Hugo's purse, or her bracelet on her arm), or small compositions (including the reproduction of the Hugo's portrait or drawing done by the writer), Vacquerie gave a puzzling image of the family. This specific type of images, though, was never broadly circulated, and seemed to have stayed with the closest relatives the Hugos and Vacquerie had.

In 1854, 9 000 francs (in gold) had been spent already on the project mentioned above, without any return. No publisher could be found who was willing to issue the work. All were afraid of the cost, and of the possible censorship the volume might trigger.

Vacquerie's and Hugo's sons pictures were all taken in Jersey, except a very few number when they moved to Guernsey, in 1855. Then, although a lab was installed at their new place, Hauteville House, the photographic production slackened. The text Vacquerie had written to accompany the pictures in *Jersey et l'Archipel de la Manche* was published in 1856 and 1863, *Les miettes de l'Histoire*. Some of the reprints he had done later on were used by Vacquerie to illustrate his books (mainly *Profils et Grimaces*), in order to turn them into personalized gifts.

Dropping photography, he concentrated on journalism and literature, both of which he had never left behind.

MATHILDE LEDUC-GRIMALDI

Biography

Auguste Vacquerie (1819–1895), schoolmate and friend of Charles Hugo. After a classical curriculum, he was first a journalist and a literary critic, for French newspapers like *Le Globe*, *l'Époque.* Very early, he was introduced into the romantic coterie and became a devoted admirer of Victor Hugo. He became part of the family when his brother Charles Vacquerie married Leopoldine Hugo, the writer elder child. After their drowning, emotional ties grew even stronger between Vacquerie and the Hugos.

He joined Hugo's sons and friend Paul Meurice venture in publishing *L'Évènement* (1848) where he was more concerned in literature than politics. When, in 1851, this paper re-named *l'Avènement du Peuple* saw most of its staff jailed, Vacquerie took it over. Then the four of them were fined and jailed at the Conciergerie in 1851, and the Evènement was shut down under Napoleon's dictatorial regime (along with him was jailed his female cat Grise and again she was in Jersey where Vacquerie took a famous photograph of her). Sharing Hugos' political ideas, he fled from France, and lived in Jersey, Guernsey and Brussels. Part of his work, such as Profils et Grimaces (1856) or Les miettes de l'histoire (1863), and his many letters to his friends or sister in France depicted his life in Jersey with the Hugo family, and showed his interest in photography. Yet, this hobby actually lasted just a few years**.**

In 1869, he founded Le Rappel with Rochefort, Paul Meurice, Charles et François-Victor Hugo, unrelentingly fighting against Napoleon III Empire. After the Empire fell, he backed the uprising of Paris (1871), as did V. Hugo and his sons.

He also wrote poetry (*L'Enfer de l'Esprit*, in 1840), a comedy (Souvent Femme Varie, in 1859) and dramas (Tragaldabas in 1848, Les Funérailles de l'Honneur, in 1861).

Back in France (around 1867), he continued his activities as a journalist, writer, and was chosen (along with Paul Meurice and Ernest Lefèvre, Vacquerie's nephew) by Victor Hugo to overlook the publication of the poet's entire work after his death.

See also: Bacot, Edmond; Wet Collodion Negative; Daguerreotype; France; Hugo, Charles and François-Victor; and Salted Paper Print.

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VALENTA, EDUARD (1857–1937)

Valenta was a professor at the Hohere Graphische Bundes-Lehr- und Versuchsanstalt in Vienna from the late 1800s to 1909 where he codirected with Josef Eder, founding director and author of famously detailed The History of Photography (Geschichte der Photographie), and later succeeded him as the school's head in 1923. The school is one of the oldest and most important with a specialty in photography and graphic arts in the world.

Valenta and Eder carried out and published in journals and annuals numerous studies of the spectra of elements and compounds, including many of the dyes important for photographic emulsions. They experimented with emulsions and published a number of photographic studies, including one of the earliest and most beautiful collections of highly detailed X-ray images (1896).

Valenta studied and published on the Lippmann process (1894–1912). Many of his Lippmann plates were held in the collection at the "Graphische." Those were mostly in the nature of lab trials, and most were failures with poor or no color. These plates, along with 60,000 others in the Graphische's collections, were donated to the Albertina in Vienna where they are in process of being cataloged.

WILLIAM R. ALSCHULER

VALENTINE, GEORGE D. (1852–1890)
Scottish photographer

George D. Valentine (1852–1890) was a son of the famous Scottish photographer James Valentine. He came to New Zealand in 1884 with the hope that the climate would improve his health. It seems that in the remaining years of his life, he was unable to suppress his sheer enthusiasm for photography and despite his fragile condition he committed himself to compiling an extensive series of landscape photographs. Beginning with views of Nelson where he initially settled, he then turned his attention to views of the Pink and White Terraces and Lake Rotomahana, both pre and post eruption 1886–1887. Moving to Auckland he broadened his coverage by making a series based on a summer cruise in the Pacific Islands, photographing Tahiti, Tonga and the Cook Islands. In 1889 he was one of the first photographers to descend into the Waitomo Caves at Otorohanga, an exploit which would have tested the physical endurance of a very fit person. Surprisingly none of his 12 × 10 inch views seem to have found their way back Scotland for his father¹s firm to distribute. Two years after he died in Auckland, Valentine & Sons dispatched a photographer to New Zealand where he made a series which were used for tourist souvenirs and postcards. These were marked with the initials of J.V. as distinct from George Valentine¹s photos who signed his prints with the initials of G.V.

WILLIAM MAIN

VALENTINE, JAMES AND SONS
Company

James Valentine and Sons of Dundee, Scotland, were a successful photo-publishing firm who derived the bulk of their income from the sale of topographical views and postcards. The firm had its origins in the activities of John Valentine, a one-time weaver who commenced the production of wood-blocks for the linen industry around 1825. In 1832 John's son James, who had been trained in the art of portrait painting in Edinburgh, was summoned to assist in the running of his father's printing firm. For a time father and son worked together, however, local directories show that they had parted company by 1840. Before James expanded into photography he produced bill-heads, engraved notices, prints of local scenes and illustrated propaganda envelopes for the American social campaigner, Elihu Burritt. James also became interested in the daguerreotype and travelled to France to study photography under M. Bulot. He was listed in the 1851 trade directories as a professional photographic artist. From the mid 1850s he supplemented his income from photographic portraiture by selling stereographs and carte-de-visites created by other photographers.

The public appetite for scenic views was evident in the growing sales of topographical lithographs after 1820. This audience was augmented by souvenir -hungry tourists whose holidays were made increasingly possible through the expansion of the railways. In the early 1860s, another member of the family, James's son William Dobson Valentine, entered the firm. He had just graduated in chemistry from University College, London, and had also trained with the renowned professional travel photographer Francis Frith at his Reigate Studios. It is thought that William encouraged his father to produce photographic views similar to those with which the firm's Aberdeen rival, George Washington Wilson, was having great success. In 1867 James Valentine was commissioned to produce a series of forty Scottish highland views for Queen Victoria and was subsequently appointed as Photographer to the Queen. William's brother George Dobson Valentine also entered the business where he concentrated mainly on portraiture. William was a thorough photographer and his topographical views show careful attention to composition. Two negatives were made of each scene and by 1878 the company's numerous views necessitated the introduction of a number dating system thereby attaching a unique number to each image within the collection.

By the 1870s Valentine's views covered the whole of Britain and were being sold singly in several sizes or in finely bound albums. The pricing of these exquisitely bound volumes demonstrated that they were intended for the middle and upper-classes. The company also sold more moderately priced individual views and inexpensive stereographs which were cheap to produce and in wide demand. The company changed its name from James Valentine to James Valentine and Sons in 1878. Following the death of James Valentine in 1879 his two sons became sole partners in the firm. This arrangement lasted until 1884 when, due to ill health, George emigrated to New Zealand where he was to become one of the earliest landscape photographers in the country. William was also keenly interested in technological advances in photography and contributed articles to periodicals such as Art Journal and the Photographic News. During the 1880s he was to write on a variety

of subjects including underwater photography and the photographing of winter scenes.

In 1886 an article appeared in the *British Journal of Photography* outlining the extent of the Valentine's operation which by then employed over one hundred people. By 1888, their catalogue included over 20,000 views of Scotland, England, Wales, Ireland and Norway. At around this time another generation of the family entered the business, William's son Harben Valentine. He was also keen to use any technological innovation which would give the firm an advantage over its competitors. By the 1890s Harben was employing the collotype process which allowed the mechanical reproduction of photographic images which would previously have been printed by hand. This greatly increased the speed at which the firm could operate. He was also to experiment with the photocrome and photogravure processes.

In 1897 the British post office permitted private cards to be sent through the mail for the first time and it was in that year that the Valentine firm were to enter the postcard market. Valentine and Sons were able to compete in the rapidly expanding market due to the technological advances which had been instigated by Harben. The combined the collotype process with the bitumen process to add colour. An indicator of their success in the production of postcards was the number of staff employed by the firm which rose from over 100 in 1886 to almost 1000 in 1900. The firm's activities spread overseas with branches opening in Canada, the United States, South Africa and Australia. William Dobson Valentine handed management of the firm over to Harben in 1900 though he was to retain an avid interest in the firm until his death in 1907. The early years of the twentieth century saw increased competition from German postcard manufacturers and Valentine responded by placing an emphasis upon the production of realistic views undoubtedly utilising their immense collection of negatives and their knowledge of topographical photography. In 1908 they became the official postcard publishers for the International Franco-British Exhibition. It was at this time that they took on the twin globe logo and its accompanying motto 'famous throughout the world.'

From about 1901 Valentine began to extend and diversify their interests to include the production of greeting cards, children's books and calendars. The number of views commissioned by the firm began to shrink in the 1950s and family interest in the firm declined with the death of Harben in 1949. The firm was eventually taken over by John Waddington and Co. Ltd. in 1963. In 1971 the archive containing Valentine's topographical views was deposited with St. Andrew's University, Fife, Scotland. Whilst the 150,000 views in the archive constitute only a remnant of the half a million which were recorded from 1878 to 1967 they provide a valuable record of popular taste and topographical photography.

ORLA FITZPATRICK

See also: Topographical Photography; Postcard; Daguerreotype; Stereoscopy; Cartes-de-Visite; Frith, Francis; Wilson, George Washington; Victoria, Queen and Albert, Prince Consort; Valentine, George Dobson; Photographic News (1858–1908); *British Journal of Photography*; Collotype; and Photogravure.

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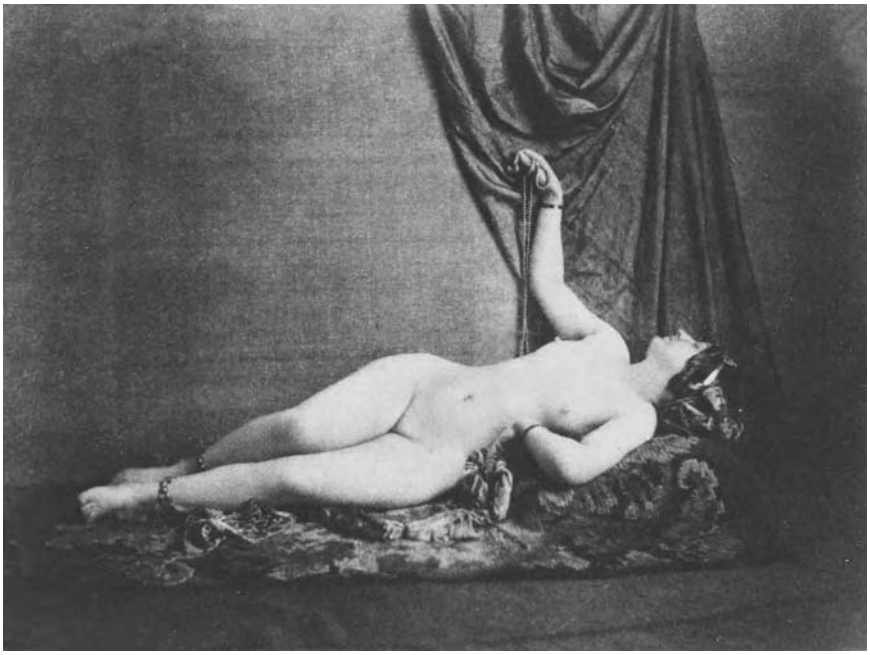
VALLOU DE VILLENEUVE, JULIEN (1795–1866)

French, artist, lithographer, and photographer

Vallou de Villeneuve was born in Boissy-Saint-Léger on 12 December 1795. From his début at the Salon of 1814 (to 1840) as a painter he regularly exhibited lithographed images of daily life, fashion, regional costumes and erotica, many done after the work of English and Dutch artists. Vallou, earlier a student of Millet and a lithographer of scenes of daily life, costume, and erotica, also published his own lithographed compositions, mostly 'female types.' From 1820 to 1830 he acquired great popularity for his engravings of fashions, costumes, every day scenes, and erotic images. Many lithographs based on his drawings were done by Raymond Noël and Régnier.

Despite a long artistic tradition and an obvious delight in the female nude, decorum in mid-century France, required that the subject be removed from the reality of the present—shown in mythological guise or as an exotic creature, distant and non-threatening. The need to provide a legitimate context for the depiction of the nude was particularly compelling in photography, and Vallou often appointed his models with the paraphernalia of the painter's studio (rugs, shawls, spears, beads, anklets, and turbans). His most successful pictures, however, are those least encumbered by artificial trappings; revealing more and borrowing less from painterly tradition,



de Villeneuve, Julien Vallou. Female Nude, #1940. Reclining, with arm raised.
The Metropolitan Museum of Art, Purchase, Lila Acheson Wallace Gift, 1993 (1993.69.1) Image © The Metropolitan Museum of Art.

these are the most poetic. While tantalizingly real in both weight and texture, Vallou's reclining nude seems nonetheless to float in an indeterminate and dreamlike space, a crescent moon in a starry sky.

In 1826 he showed at the Salon "Costumes des Provinces Septentrionales des Pays-Bas." He published in 1829 lithographs of "Types des Femmes," Souvenirs of an artist. In 1830 with Achille Deveria and Numas, Maurin and Tessaert, he contributed to the compendium of romantic erotica called Imagerie Galante (Paris, 1830), which provocatively updated an erotic mode found in 18th-century engravings. The subjects were pictorial versions of stock characters from popular novels and plays. Issued through several publishers. In 1839 he published the lithographs "Les Jeunes Femmes, Groupes de Têtes." He became interested in photography in 1842, shortly after the new medium's invention, as an aid to his graphic work. His subjects included fashion, costume, and daily life, as well as light erotica, sometimes published in conjunction with other artists. In 1850 he began to practice photography at 18 Rue Bleu, Paris (nudes, portraits of actors). He fixed prints with ammoniac after the process of Humbert de Molard. He liked to retouch his negatives. Durieu criticized him concerning this procedure. By 1850 Vallou de Villeneuve had begun to practice photography in his studio, primarily female nudes and portraits of actors.

In 1851 he became member of the Société héliographique. Between 1851 and 1855, Julien Vallou de Villeneuve, made a series of small-scale photographs of female nudes, which he marketed as models for artists.

Around the symbolism photography art in the 19th Century painters got already a rapid eye for the expressive possibilities of photography. Photographers ogled to the achievements of painted art. The photos mapped the wealth of this interaction. Already as from the first steps in the 19th Century photography had an enriching but also ambiguous link with painting art. Their respective histories were intertwined and revealed many similarities. The mutual teamwork formed the scope of the show, symbolism, as a result of the retrospective Fernand Khnopff in the Royal Museum for Fine Art in Brussels, Belgium.

In 1853-54 Vallou published a series of nude studies, Études d'après nature, which were sold as artists models and to the general public. Several were used for well-known works by Gustave Courbet. Vallou de Villeneuve's works are admired for their emotional restraint, as well as for their masterful orchestration of form. Gustave Courbet, Gustave Moreau and Eugène Delacroix inspired themselves on photograph's, which they let make the Villeneuve, Henri Rupp and Eugène Durieu by photographers such as Julien Vallou. Also the school of Barbizon brought painters and photographers closer to each other. Camille Corot and Théodore Rousseau, Eugène Cuvelier, Charles Famin and Paul Berthier literally walked the same paths at the Fontainebleau. Around the symbolism, the links between photography and painting art exposed the photographic penchant of symbolism in the painter by means of photographic portraits, studies to nature, mises-en-scène and tableaux vivants, and included as well was picturalism. Thanks to photography, artists discovered a totally new manner to capture reality. Vallou's nudes have long been associated with those of Gustave Courbet, who was known to have

used photographs in his painting process. Although no absolute one-to-one correspondence can be proven, the quality of Vallou's models is very close to Courbet's concept of the nude. J. Vallou de Villeneuve in his photographs organized zones of light and shade and worked in small formats intended for albums or "intimate" portfolios. His personages are without ornamentation in simple decors. His nudes are improved by studied lighting. Some accessories were placed within view to add simple graphics.

In his nude studies intended for artists, he was not content with habitual poses, but instead invented new ideas of attitudes.

From 1853 to 1854, he was a founding member of the Société française de photographie (S.F.P.) and in 1855 he gave his prints to this society.

On 4 May 1866, he died in Paris.

JOHAN SWINNEN

Biography

French lithographer, photographer and painter. Between 1851 and 1855 Julien Vallou de Villeneuve, a student of Millet and a lithographer of scenes of daily life, costume, and erotica, made a series of small-scale photographs of female nudes that he marketed as models for artists; evidence suggests that they were used as such by Gustave Courbet, among others.

See also: France; Lithography; Erotic Photography; Nudes; Portraiture; Société héliographique; Painters and Photography; Courbet, Gustave; Delacroix, Ferdinand Victor Eugène; Durieu, Jean-Louis-Marie-Eugène; and Société française de photographie.

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VAN KINSBERGEN, ISIDORE (1821–1905)

Dutch-Belgian photographer and theatre maker in the Dutch East Indies

When Isidore van Kinsbergen arrived in Batavia in the Dutch East Indies (now Jakarta in Indonesia) on 26 August 1851, he described himself as an artist, lithographer, set painter and opera singer. Such a versatile background meant a great advantage in a small colonial town like Batavia where artists needed several skills in order to survive. Van Kinsbergen's leading role in the Théâtre Français de Batavia gained him support from the upper social classes of colonial society and through this interesting photographic assignments from the colonial government. "A capable and experienced photographer" was the opinion of the Amsterdam photographic pioneer Eduard Isaac Asser.

It is not known where and from whom Van Kinsbergen learned to photograph. However his background as a lithographer and his entrepreneurial spirit no doubt whetted his interest in the medium. His first photographic activities in Batavia date from 1855 when he briefly associated with the French photographer Antoine François Lecouteux.

Via his contacts in Batavia's artistic and scientific circles, it is certain that Van Kinsbergen was familiar with what was being published in Europe in the field of illustration. However, it is doubtful whether he saw there much photography of any kind of quality. In view of his links to the Parisian art world, it is well possible that he became acquainted with photography in the French capital when he resided there for a few months in 1854. Van Kinsbergen's sense of photographic monumentality evokes the work of his French contemporaries Edouard-Denis Baldus and Louis-Auguste and Auguste-Rosalie Bisson.

In 1844, the Dutch Ministry of Colonies, being far ahead of its time, commissioned the German photographer Adolph Schaefer to make daguerreotypes of Javanese antiquities including the Borobudur. When nearly twenty years later Van Kinsbergen picked up the thread where Schaefer left off, photography was already being used elsewhere for documenting ancient treasures and archaeological findings (Egypt, India etc.). He had come to the attention of the Dutch colonial government in September 1862 with photographs taken during a journey with the Governor-General on Java. These convinced the colonial government of his ability to make an extensive photographic survey of Javanese antiquities. Meanwhile the government was also aware of the photographs he had made of famous monuments and temples in Bangkok in Siam (Thailand), where he had been assigned as photographer to a diplomatic mission earlier that year.

In December 1862 the Batavian Society of Arts and Sciences (acting on behalf of the colonial government) drew up a contract with Van Kinsbergen. The Society did not give any directions as to how he should photograph the Hindu-Javanese and Buddhist antiquities. This was left entirely to his own technical and artistic insights. Between 1863 and 1867 Van Kinsbergen made more than 330 photographs which were published in the portfolio Oudheden van Java [Antiquities of Java] in a chronological and geographical order, commencing with the first photographs he made around Bogor on West Java and concluding with images of the Panataran temple complex on East Java.

Van Kinsbergen showed an immense interest in the antiquities he photographed. The Dieng Plateau was considered one of his personal rediscoveries. However, what he thought about the art of photography itself is not revealed. Information on his artistic motivation can only be gleaned by looking at the photographs themselves and from a few responses to his work by experts that specialized in antiquities or the East Indies. Apart from Eduard Asser, it is not known whether fellow photographers appreciated his work as it was hardly reviewed in photography magazines of the period.

Van Kinsbergen worked with different sized negatives (now preserved in the department of history and archaeology at the Ministry of Culture and Tourism in Jakarta) measuring 17 × 21 cm up to 30 × 40 cm. In as far as on-site conditions allowed, he always searched for a viewpoint that showed off the characteristic form of a building, sculpture or artefact to its best advantage. He often worked with images that filled the entire picture in order to do justice to the detailing of the reliefs on the richly decorated temples.

Van Kinsbergen worked deliberately with direct sunlight enabling him to give depth and liveliness to the sculpture he photographed. Often combined with a pitch-black background which he obtained by scratching away the layer of emulsion on the negative, this approach became his trademark. The highly contrasting tone and the theatrical effect that went with it, is typical of not only his archaeological photographs but almost all his topographical views as well. This characteristic makes his photographs easily distinguishable from those Woodbury & Page made for instance. This choice of lighting illustrates that Van Kinsbergen was not only interested in conveying detailed information, but wanted to bring out the dramatic, expressive powers of subjects he photographed.

Van Kinsbergen made a near complete documentation in more than 100 photographs of Candi Panataran, his tour de force of the Antiquities of Java series. However, Boro-Boedoer [Borobudur] is still considered the true pinnacle of his archaeological work. Supplementing the Antiquities of Java series, the Batavian Society had commissioned Van Kinsbergen in 1873 to photograph the Borobudur. The manner in which he immortalized the various Buddha types on this world famous monument enraptured the Dutch scholar G.P. Rouffaer: "If ever the concept of God, as we see it, has revealed itself to the Hindus in the language of sculpture than is it certainly in these depictions of the sitting Buddha."

Van Kinsbergen's assignment from the Batavian Society provided the artistic and financial opportunity to establish his reputation as a photographer with a diverse oeuvre comprising topographical photographs, portraits, peoples of the region, still lives and even nudes. Van Kinsbergen tackled these photographic genres with the same verve as the Javanese antiquities.

In his studio, the relaxed manner in which Van Kinsbergen had his models posing reveals the communicative skills of a theatre director. Each person or group that appeared before his camera offered him fresh opportunities to experiment with a range of poses and forms of expression. He saw the Javanese models who visited his studio more as objects of academic study rather than ethnographic curiosities. His portraits of rulers (Yogyakarta, Surakarta) also reveal how Van Kinsbergen tried not only to depict the symbolic function of a sovereign, but also to make a study of the person behind it. In 1865, he was the first photographer visiting Bali, where he made an exceptional portrait series of the Raja of Buleleng and his court representing all ranks of society.

In his object-oriented and monumental approach to his subjects Van Kinsbergen was closely allied to a photographer like Linnaeus Tripe, who worked in India under similar circumstances. Van Kinsbergen can be described as the only Dutch photographer working between 1850 and 1880 who internationally measures up to colleagues now counted among the top exponents of nineteenth-century photography.

Isidore van Kinsbergen acquired international acclaim with his work that was widely distributed to international institutions. Most of it is still being preserved in the collections of, among others, the KIT Tropenmuseum and the Rijksmuseum in Amsterdam, the National Museum of Ethnology, the Kern Institute and the KITLV in Leiden, the Royal Archives in The Hague, the British Library in London, the Bibliothèque Nationale de France and the Société Asiatique in Paris. His photographs were found in the legacy of the French painter Paul Gauguin, being a direct source of inspiration for several paintings and woodcuts. The French collector Prince Roland Bonaparte owned hundreds of Van Kinsbergen's photographs now kept at the Société de Géographie in Paris.

Saskia Asser
Gerda Theuns-de Boer

Biography

Isidore van Kinsbergen was born in Bruges in the southern Netherlands (now Belgium) on 3 September 1821, as the son of a Flemish mother and a Dutch father. In the 1840s Van Kinsbergen worked as an engraver in Ghent where he also studied Chant français at the Conservatory. In 1851 he moved to Batavia in the Dutch East Indies (now Jakarta in Indonesia), where he was appointed as a set painter for the Théâtre Français de Batavia. He would be closely involved in the theatre world until his death. In 1855 he took up photography, later opening a commercial studio in Batavia. Van Kinsbergen was one of the first photographers to visit Siam (Thailand, 1862), and to photograph the rulers of Yogyakarta, Surakarta and Bali (1862–1865). He became famous for his extensive photo series of Javanese antiquities commissioned by the Dutch colonial government and the Batavian Society of Arts and Sciences, published as the series Oudheden van Java [Antiquities of Java] (1863–1867) and Boro-Boedoer [Borobudur] (1873). He exhibited at the World Exhibitions in Vienna (1873), Paris (1878) and Amsterdam (1883). Van Kinsbergen died on 10 September 1905 in Batavia.

See also: Asser, Eduard Isaac; Edouard-Denis Baldus; Bisson, Louis-Auguste and Auguste-Rosalie; Schaefer, Adolph; Woodbury, Walter Bentley; Tripe, Linnaeus; and Bonaparte, Roland, Prince.

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VAN MONCKHOVEN, DÉSIRÉ (1834–1882)

Belgian photographic scientist, writer, and industrialist

Désiré van Monckhoven was born in Ghent on 25 September 1834, the only child of an unmarried mother. Despite these inauspicious beginnings, van Monckhoven proved to be a gifted child, showing a marked interest in physics and chemistry. His academic promise earned him a transfer from the Quanonne Institute, where he was training to be a clerk, to the Atheneum [high school]. Van Monckhoven briefly became a bank clerk, but pursued his passion for photography, which enabled him to turn his knowledge of science to commercial use.

Van Monckhoven received a thorough grounding in photographic practice from Charles D'Hoy (1823–1892), one of the first professionals in Ghent, and by 1853 or 1854 van Monckhoven had supplied a view of the local gothic town hall for the series Variétés photographiques published by Louis-Désiré Blanquart-Evrard. However, van Monckhoven's predilection was for research and writing, rather than running a studio. Barely 20 years old, he published the first edition of his Traité de photographie sur collodion [Treatise on collodium photography], Paris: A. Gaudin et frère, 1855. An initial printing in March 1855 of 1500 copies sold out, and was following by a second printing of 750 copies later in the year. This success persuaded his publishers to bring out a second, greatly expanded edition of the textbook. Van Monckhoven's Traité général de photographie [General treatise on photography], Paris: A. Gaudin et frère, 1856, in a print-run of 3000 copies, consolidated the author's reputation as a leading photographic scientist in continental Europe, an independent researcher able to analyse and arrive at accurate, fault-free formulae, and to disseminate these in clear and unambiguous language.

In order to legitimize his standing in the eyes of the broader scientific community, van Monckhoven enrolled as a student at the University of Ghent in 1857, where he was awarded a doctorate in natural science in 1862. In parallel, he continued his output of handbooks, collecting data from an array of sources and setting out his tried-and-tested conclusions in practical form. His work Méthodes simplifiées de photographie sur papier [Simplified methods of paper photography], Paris: Marion et Cie; A. Gaudin et frère, 1857, was followed by Procédé nouveau de photographie sur plaques de fer [New process of photography on ferrous plates], Paris: A. Gaudin et frère; A. Secretan, 1858, a third edition of his magisterial Traité under the title Répertoire général de photographie Paris et Londres, A. Gaudin et frère, 1859, and a simplified version of the latter as Traité populaire de photographie sur collodion, Paris: Leiber, 1862. Van Monckhoven was also a joint founder of the monthly Bulletin belge de la photographie in 1862, contributing a column on technical innovations.

Van Monckhoven turned his attention to photographic optics. He took out a Belgian patent in August 1863 for "an optical apparatus intended for enlarging by projection." Running counter to diurnal motion, the sun's rays were reflected uniformly by means of a mirror propelled mechanically by clockwork. Further patent

applications were made in France and England, and van Monckhoven set up as a manufacturer of heliostat enlargers under the name "appareil solar dialytique" [dialytic solar apparatus]. He received a bronze medal at the Paris international exhibition of 1867 for his innovation, and published the fruit of his research as Traité d'optique photographique, Paris: V. Masson et fils, 1866. The Traité général quickly ran to fourth and fifth editions also under the Masson imprint in 1863 and 1865 respectively.

Van Monckhoven moved to Vienna in January 1867 to form a partnership with the portrait photographer Emil Rabending, constructing a state-of-the-art studio in the Wieden district, at Favoritenstrasse 3 "in the courtyard of the imperial iron foundry." About two years later van Monckhoven dissolved the partnership to pursue scientific interests in his own laboratory. Returning to Ghent in the autumn of 1870, van Monckhoven established a factory for the production of carbon paper, and published two works on the subject: Historique du procédé au charbon [History of the carbon process], Ghent: Annoot-Braeckman, 1875 and Traité pratique de photographie au charbon [Practical treatise on carbon photography], Paris: G. Masson, 1876. He also published a sixth edition of the Traité général, Paris: V. Masson, 1873.

The introduction of dry-plate photography stimulated van Monckhoven to make his most significant contribution to photo-chemistry. Realising that Richard Leach Maddox's invention was poised to revolutionise photography thanks to its ease of handling, he had the factory diversify into emulsion production. Pursuing his research into the properties of silver halides in 1879, van Monckhoven discovered that the ripening of emulsion on gelatine-bromide plates could be improved by adding ammonia, thereby enhancing the tonal range. He wrote Introduction sur le procédé au gélatino-bromure d'argent [Introduction to the silver gelatine bromide process], Ghent: C. Annoot-Braeckman, which went into four editions between 1879 and 1882. A seventh edition of the Traité général, Paris: G. Masson, 1880, contained a chapter on dry-plate photography summarising the author's findings. The factory was expanded in 1880, employing thirty female workers for coating plates, and reached an annual turnover of one million gold francs that year.

Désiré van Monckhoven married Hortense Tackels (1839–1911) on 12 December 1872, and they had two daughters. In his spare time, he devoted himself to astronomy, and constructed a private observatory. A telescope, equipped with a 23 cm Steinheil lens, was custom-built in 1880, and van Monckhoven began work on a star atlas. This work went unrealised, as Van Monckhoven died suddenly of a heart attack on the evening of his forty-eighth birthday, at his home in Ghent on 25 September 1882.

Hortense Tackels headed the firm after her husband's death, and was followed by her son-in-law, the engineer and future senator Jean-Alfred de Lanier-van Monckhoven (born 1852). The firm successfully marketed dry plates under the D.V.M. label from around 1886, operating out of Boulevard d'Akkergem 74 until 1908. Two posthumous editions of the Traité général appeared under the imprint Paris: G. Masson, 1884 and 1889.

The Museum voor de Geschiedenis van de Wetenschappen [Museum of the History of Science], Ghent, houses a dialytic solar apparatus, some van Monckhoven manuscripts and a virtually complete set of his publications. The University of Ghent acquired the 23 cm telescope in 1904, which is still operational in the observatory. The Nadar papers in the western manuscripts section at the Bibliothèque nationale de France—Département des manuscrits contain a substantial and lively correspondence by van Monckhoven.

STEVEN F. JOSEPH

Biography

Désiré Carolus Emanuel van Monckhoven was born in Ghent on 25 September 1834, the illegitimate son of Francisca Maria van Monckhoven. The birth certificate declares "father unknown." Early clerical training was followed by studies at the University of Ghent, where he gained a doctorate in 1862. A renowned photo-chemist, van Monckhoven published his initial research on collodium in 1855, and wrote numerous works on photography and optics. Also a pioneer of the photographic industry in Belgium, his factory, founded in 1870, produced carbon tissue, and later emulsion for dry-plate photography. He married Hortense Tackels (1839–1911) on 12 December 1872, and they had two daughters. Van Monckhoven died suddenly of a heart attack on his forty-eighth birthday, at his home in Ghent on 25 September 1882. His widow continued to run the factory successfully, which operated in Ghent, Boulevard d'Akkergem 74, until 1908.

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VANCE, ROBERT H (1825–1876)

In 1849, gold was discovered in the workings of Sutter's Mill at Coloma, California, just ten years after the announcements of the inventions of photography in Europe. News of Daguerre's process travelled to America ahead of William Henry Fox Talbot's paper-based method; consequently, east coast practitioners soon began to specialise in daguerreotypes.

Robert H. Vance, who was born in Maine and inherited money from his father, learned about photography as a young man while working in portrait studios in New Hampshire and Boston. By February 1847, he had his own gallery in Valparaiso, Chile, and later opened a similar venture in Santiago. Much of Vance's commissioned work came from owners of the wealthy, silver mines of Atacama Province, but circumstantial evidence suggests he also documented landscapes for his own satisfaction, then a rare practice among professionals.

By 1850, Vance was 25 years old and the California gold rush was underway. He sold his South American studios and moved to San Francisco to take advantage of the commercial opportunities (of the gold rush). En route to America, he stopped at Cuzco in the Peruvian Andes, and one biographer (Abel Alexander of Buenos Aires) believes this body of work represented Vance's best photography whilst in South America.

Within twelve months of his arrival in northern California, Vance had opened portrait studios in Sacramento, Marysville and San José, and eventually expanded his interests to Nevada (Virginia City and Carson City), and Hong Kong. Declaring Vance's Sacramento location as the "finest Daguerreotype and Photograph Gallery in the world," the San Francisco Daily Times described the "magnificent chandeliers, lace curtains, orlet [bordered] carpets, and the richest style of furniture." There were "eight elegantly finished reception rooms, and twelve operating rooms [and] ladies sitting and toilet rooms, where family parties may go, with a perfect assurance of privacy, and the premises are so arranged that there are at least three distinct galleries, each separate from the other."

Vance was an expert practitioner of the daguerreotype process, but he advertised cartes-de-visite at his First Premium Gallery in San Francisco, very soon after they became popular in Europe. He also offered colour portraits, which used the photograph as a guide for an artist working via a solar camera, and marketed Ambrotypes by emphasising superiority over his rivals, because those "taken by me are upon thick glass, and are atmospherically sealed, and will stand forever." But Vance lost money by dabbling in the stock market, and sold his gallery in 1864. The following year, he returned to New York, where he lived for eleven years until a sudden death at the age of 51. He was buried in Augusta, Maine.

In an appreciation in 1946, Ansel Adams noted that "the photographers of earlier days were definitely unaware of being 'artists.' They worked as craftsmen, … and their comment was not concerned by conflicting influences of manner and style." Adams believed that Vance was not only a superb craftsman, but that he had other qualities—"careful thought and selection of viewpoint." That is, he combined technical ability with creativity.

Robert Vance excelled as an artist, but he must also be remembered for the twelve-month undertaking he began in 1850. Once settled in San Francisco, his entrepreneurial spirit reasoned that, beyond California, people were eager to learn about the gold rush and that he was well placed to provide a visual narrative of its people and the places. Leaving his studios to be run by managers, Vance secured over three hundred images of life in California, which were dominated by themes of the gold fields. He framed his work, arranged the layout, published a catalogue and, in 1851, opened the exhibition on Broadway, New York.

In the 8-page "Catalogue of daguerreotype panoramic views of California," Vance featured portraits of gold miners and native Americans, photographs showing aspects of gold prospecting, the gold mining camps and pictorial landscapes. The important segments illustrated the popular locations—the Stanislaus River, the Mokelumne Mines near Sonora, Sacramento, Nevada City, Yuba City and Coloma in El Dorado County. He included San Francisco—before the fire of May 1851, and afterwards. He also showed emerging styles of architecture and "almost every variety of scenery," said the editor of *Photographic Art Journal*, in a review which described the "three hundred daguerreotypes so arranged that a circuit of several miles of scenery can be seen at a glance." Vance had displayed "an exquisite taste for the sublime and beautiful."

From the outset of his career, Vance had favoured a large, whole-plate camera, although studios portraits were generally taken on a smaller format. (A portrait of Horatio G Finch in the Bancroft Library was taken on a "mammoth" plate measuring 32cm × 27cm.) That Vance was able to visit the mining camps of the gold fields and return with processed whole-plate images of excellent quality, speaks well for his mastery of the process.

In spite of Vance's abilities, and good reviews, the New York exhibition failed. There were three possible reasons:

The public had lost interest in West coast news
Vance set the admission price too high
Vance neglected to promote the exhibition adequately

In February1853, Vance attempted to sell his collection, but it took five months before being auctioned to an entrepreneur from St Louis, Missouri, who exhibited them with his own work in the spring 1854. A review appeared in the *Photographic and Fine Art Journal* two years later, but by then, all three hundred images had disappeared.

Scholars argue that they may have been destroyed by fire, or sold for their metal content, and optimists maintain Vance's Views of California may yet re-emerge to receive renewed recognition. In 1946, Ansel Adams had already acknowledged the master's touch when he praised "the clarity of line and edge, the simple arrangement of mass, the beauty and richness of tonal values [and] above all, the integrity and forthright simplicity of Vance's photography and the evidence of his devotion to the enduring qualities of the world about him."

Vance's work is located at:

The Bancroft Library's California Heritage Collection
The Getty Museum
California State Library, Sacramento
Oakland Museum of California

RON CALLENDER

See also: Talbot, William Henry Fox; Daguerre, Louis-Jacques-Mandé; Cartes-de-Visit; and *Photographic Art Journal* (later *Photographic and Fine Art Journal*).

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VARIN FRÈRES
Pierre-Amédée (1818–1883), Pierre-Adolphe (1821–1897), and Eugène-Napoléon (1831–1911)

French photographers and printmakers

Descendents of an old dynasty of tinsmiths and printmakers established in Châlons-sur-Marne, near Reims, Amédée, Adolphe, and Eugène Varin studied printmaking in Paris. They became very successful in the 1850's and created many reproductive prints after paintings from the Salon, mostly for the publisher Goupil. Amédée and Eugène worked collaboratively and often co-signed the prints. In the same vein, their photographs are difficult to attribute to one or the other brother.

Little is known about the Varin brothers' photographic activity, which began around 1845–46 (a few portrait daguerreotypes from this time have survived). During the 1850's, they produced salt paper prints: landscapes, family portraits and intimate scenes, and architectural views and cityscapes taken during travels in the provinces, especially in La Rochelle. Aesthetically, their photographs rely on a solid artistic education and are reminiscent of amateurs photography of this era. The Varin brothers were not involved in the photographic world, and their photographic practice appears disconnected from their careers as professional printmakers. They rarely used photography as an aid for printmaking, nor envisioned it as a publishing technique. However, Quentin-Dailly, a publisher in Reims, released a portfolio of their views of the city.

PIERRE-LIN RENIÉ

VEDANI, CAMILLO
(active 1853–1870)

Italian-born studio owner and teacher

An Italian photographer active in Brazil between 1853 and 1870, Camillo Vedani had two studios in Rio de Janeiro, first on Assembléia St. and later on Ouvidor St. He also taught drawing and Italian to make ends meet. He spent five years in Salvador, Bahia (1860–1865). The photographs he took there overlap with and complement views taken by Benjamin Robert Mulock (1859–1862). Vedani also photographed the Bahia and San Francisco Railway terminus after it was completed. He produced stunning images of the city of Salvador, characterized by a bold style and an esthetic that was ahead of its time. He returned to Rio in 1865 and put together two albums of views of Salvador and Rio dating from 1860 to 1870. A label on one album reads: "Landscape photographer…. Will travel anywhere to photograph views and establishments." Brazilian collector Gilberto Ferrez, the grandson of Marc Ferrez, discovered the albums in the 20th century, which are now at the Moreira Salles Institute, Rio de Janeiro. Vedani also produced an album of photographs of Rio taken between 1865 and 1875. Both Gilberto Ferrez and photographer Pedro Vasquez have published his photographs. His works have been exhibited in Rio and São Paulo.

SABRINA GLEDHILL

VERESS, FERENC (1832–1916)
Hungarian photographer

Ferenc Veress, the son of a civil servant reputedly of noble descent, was born in Kolozsvár, Transylvania, on 1 September 1832. At the age of 16, in 1848–49, he was a goldsmith's apprentice in Nagyenyed to Károly Budai, one of the first amateur daguerreotypists in Transylvania.

He reckoned his photographic career all started with the gift of a camera from his mother in 1850, when he mostly took talbotypes. From this point his career could have turned in two directions. He could have either taken photographs, made experiments similarly to the well-to-do amateurs of the age or could have chosen photography as a profession and taken commercial photographs in his studio. He took both ways and opened the first permanent studio of Transylvania in Klausenburg and never gave up experimenting. The money he earned from his studio portraits he spent on photographic experiments and his land- and cityscapes.

It was on April 21, 1852, that he contacted Elek Buda, the local squire who had tried out and modified all the photographic techniques of the age. Under him, Veress mastered the daguerreotype, and a year later, opened a studio in Kolozsvár, the first permanent studio in Transylvania. He used the wet collodion technique to make albumen prints of glass negatives. In the same year, he experimented jointly with count Zsigmond Kornis. The activity of this promising duo came to a halt in 1854, when the count died. Baron Károly Apor, who presided over the Marosvásárhely royal Court of Appeal, introduced him to Count Imre Mikó, a Transylvanian patriot. The three continued photographic experiments. Mikó helped him photograph the Transylvanian aristocracy and he compiled an album of the photographs he took, no original copy of which has survived.

In 1855, the aristocratic patrons made it possible for him to go on a tour of study to Munich and Paris where he visited several famous photo studios. As a result, his technical knowledge was well above the country's average, he could produce life-size portraits which were then coloured in watercolours or oils by his temporary partner György Vastagh. He made ferrotypes, pannotypes, but he could also create photos on leather and canvas. His cyanotypes have survived. In 1858, he married Josefa Stein, the daughter of a Kolozsvár publisher, who also owned the local press, book and stationery shop. The Veresses had seven children, five of whom survived to adulthood.

At the end of 1859, he was the first person in Hungary to use Disderi's 1858 Paris invention, the *cartes-de-visite*.

His first landscapes date back to 1859. He used the dry collodion process, which deviated form the generally-used wet process in that a cover protected the humidity of the collodion layer for a few weeks, keeping it ready for use at any time. Count Imre Mikó initiated and assisted in the establishment of the Transylvanian Museum Circle in the same year, with Veress as official photographer. He compiled several albums and series, such as the album "Kolozsvár in Pictures," in two volumes, now housed in the Sion Collection of Kolozsvár University Library. He took his stereo photographs, featuring fifty views of the city, at the same time. The technique he was the first to apply in Hungary, simplified the tedious tasks of landscape photography associated with the wet process.

In 1861, Veress built a new studio-cum-home in Kolozsvár, which was extended seven years later. He was to work there for 28 years without interruption.

In 1862, he photographed, and sold cartes-de-visite of the members of the Kolozsvár National Theatre. He published his call to all the country's photographers, who, at that time, numbered roughly 250, in the paper "Ország Tükre":

> Our photographers could do a great service to our homeland by photographing, and collecting pictures of, lesser and more important men in the sciences, arts, industry and trade, and submit their resulting albums to museums… Our photographers could also do a great service to our history by taking photographs of all our relics, fortresses, old castles and country seats, ruinous churches and caves, which, though still in existence at present, are doomed to perish within a brief decade.
>
> (Veress, "A fényképezés múltja, jelene, jövője hazánkban" [The Past, Present and Future of Photography on Our Country], Ország Tükre [Mirror of Our Country], 9, 1862, 132–133)

In 1869, he sent Queen Elisabeth an ornate album with pictures with the remark: "If only all historic sights of Hungary could be photographed and… stored in Her Majesty's special library, we should be doing future generations a great service."

In 1872, Veress took a hundred and fifty-six 25 × 30 cm glass negatives of Central Transylvania, and he exhibited 144 of them at the Vienna World Fair one year later.

Some of the above albums must have been realized. One of them belongs to the Vienna Höhere Graphische Lehr- und Versuchsanstalt. Seventy-eight of his landscapes and about the same number of pictures of Kolozsvár have survived in family archives, museums and in the collection of the Hungarian Museum of Photography.

His 1876 exhibition at the National Industry and Farm Produce Fair was the first to show the technique of porcelain decorated with photographs and, in 1879, he exhibited more than three hundred such pictures in Székesfehérvár and Deés.

In 1880, he published a work of fiction entitled "Álomképek" [Pictures in My Dreams], under the

pseudonym Ferenc Turul. He established also a model-farm, where he improved more than 800 different kinds of apple.

In 1881–1882 he taught photography as an associate of Franz Josef University, Kolozsvár.

He launched the journal *Fényképészeti Lapok* [Photographic Papers] on January 1, 1882, as its owner, editor, publisher and most industrious reviewer. This, the first professional photographic journal in Hungary was published regularly until December 1888, and extended 84 issues.

He is known above all for his experiments of heliochromy, the very first direct colour process. Five years of experiments to take colour photographs accelerated in 1884 when he first managed to fix a heliochrome image, which claimed due success at the Paris World Fair in 1892. He was the only Hungarian photographer of the time to acquire worldwide recognition. In 1891, he carried out his 2663rd colour experiment.

In 1890, he closed his studio, leased it to the photographer József Kató, and devoted the rest of his life to colour photography, slowly sinking into poverty. (The year 1811 saw his 6,056th experiment with heliochromy.)

His death on 3 April, 1916, came only months before Romania's declaration of war on the Austro-Hungarian Monarchy and the Romanian invasion of Transylvania.

KÁROLY KINCSES

Biography

Ferenc Veress was born on 1 September 1832 in Kolozsvár [Klausenburg, Cluj], Transylvania. He learnt to be a goldsmith, just like many of the early daugerrotype-photographers and obtained his first camera in 1850. In 1853 he opened a studio in Kolozsvár, the first permanent photographic atelier in Transylvania. In 1855, his aristocratic patrons made it possible for him to go on a tour of study to Munich and Paris where he visited several famous photo studios. As a result, his technical knowledge was well above the country's average. There is not a single process in photography that he left unnoticed, he tried out, corrected and improved them. (He made ferrotypes, pannotypes, but he could also create photos on leather and canvas. His cyanotypes have survived.) At the end of 1859, he was the first person in Hungary to use Disderi's 1858 Paris invention, the cartes-de-visite. According to his calculations he took the studio-photo of nearly 40.000 people. In the meantime he took fascinating land- and cityscapes. His first landscapes date back to 1859. He invented and applied a Taupenot-type semi-dry plate. He compiled several albums and series, some of them have survived in several museum's collections. He brought making photographs on porcelain to perfection. His 1876 exhibition at the National Industry and Farm Produce Fair was the first to show the technique of porcelain decorated with photographs. He is known above all for his experiments of heliochromy, the very first direct colour process. Five years of experiments to take colour photographs accelerated in 1884 when he first managed to fix a heliochrome image, which claimed due success at the Paris World Fair. He was the only Hungarian photographer of the time to acquire worldwide recognition. He published the first regular Hungarian photographic journal: *Fényképészeti Lapok* [Photographic Papers] between 1882 and 1888. He taught photography at the University of Kolozsvár between 1881-82. In 1890, he closed his studio, leased it to the photographer József Kató, and devoted the rest of his life to colour photography, slowly sinking into poverty. He died on 3 April, 1916.

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VERNACULAR PHOTOGRAPHY

The term "vernacular" literally means the ordinary and ubiquitous but it also refers to qualities specific to particular regions or cultures. Its attachment to the word "photography" is a recent development, part of an effort to devise a way of representing photography's history that can incorporate all of its many manifestations and functions. Although all photographs are potentially vernacular in nature, the phrase "vernacular photography" is generally used to encompass all those photographic practices and genres that fall outside the standard art history of the medium. This might include, for example, all sorts of typical commercial portraits or views, but also amateur practices where photographs were combined with other media and turned into hybrid objects. It would also include distinctive regional photographic practices, including those found in such places as Africa, Asia or Latin America. From this perspective, vernacular photography encompasses the vast majority of the world's photographs.

A few selected examples give some idea of vernacular photography's variety of forms and meanings. Although not given much attention by historians today, photographic jewellery was a staple product of the pro-

fessional portrait photographer of the mid-nineteenth century. The practice of carrying a small painted portrait of a loved one predates photography itself by quite a few years. It was logical that, following the invention of photography in 1839, calotypes, daguerreotypes, ambrotypes, tintypes and albumen prints would also find their way into the pins, rings, pendants, brooches and bracelets that were then so fashionable. By this means, photography allowed the middle classes to adopt a cheaper version (twenty times cheaper in most cases) of the visual habits of their betters. Photographic jewellery seems to have fulfilled a range of different functions (and, of course, the same piece of jewellery could signify affection at one moment and mourning at another, depending on the fate of its subject). A single necklace pendant might have portraits of husband and wife on either of its sides, lying back to back, never to be parted. For the object to be experienced in full, it has to be turned from side to side, a form of perpetual caress preordained by its designer. Other examples include photographic lockets containing two facing but separate portraits, such that the man and woman inside initially lie hidden, kissing each other in the dark until liberated into the light of a loved one's gaze. Pieces of human hair, sometimes elaborately woven into patterns, were frequently added to this jewellery, turning them into modern fetish objects.

A similar gesture can be witnessed in an embellished daguerreotype from the collection of Matthew Isenburg in Connecticut, USA. In this object we find a combination of daguerreotype and dress fabric inside a daguerreotype case, put together in about 1850. When we open this case we are invited to literally touch a piece of the cloth that, we can see from the photograph, once also touched the skin of this long-departed girl. We touch what she touched, turning this square of fabric into a membrane conjoining past and present, the living and the dead. By this creative contrivance, absence and historical distance are temporarily bridged by a moment of shared bodily sensation, making the remembrance of this girl into an experience at once optical and haptic.

Vernacular photographic practices frequently involve the elaboration of the photograph through the addition of other materials and iconography. It was common in the nineteenth century, for example, to surround a photograph with a wreath as a sign of both mourning and faith in the eventual resurrection of the photograph's subject. One example comes in a large timber frame, with an albumen photograph of a young woman in its center. Under this rather formulaic studio portrait are the words "At Rest," impressed into a sheet of copper and pinned to the board behind. At each of its two top edges are rosettes, woven out of human hair (probably hers). Around all of this rests an extravagant wreath of flowers made from wax, with similarly waxen butterflies flitting decoratively amongst the petals. It was probably made in about 1890 by a group of women friends in memory of the departed. In another, similar example, a small tintype of a little girl sitting on what we take to be her father's knee has, after her death, been surrounded, first by some fancy metal edging and then by a lovingly embroidered garland woven into a background of black velvet. The labor of embroidery ensures that this act of mourning is a slow one, deliberated and extended through time. The same gesture was extended to a framed albumen portrait of General José Antonio Páez, a man centrally involved in securing the independence of both Colombia and Venezuela. In about 1873, after his death in New York, an official portrait of him in his uniform was surrounded by a wreath made out of one of his own shirts. Through this skillful act of remembrance, history is made personal, and an otherwise formulaic portrait is transformed into the equivalent of a sacred relic.

Framed and painted tintypes might also be described as vernacular. The research of American collector Stanley Burns has shown that these types of photograph were produced in large numbers from the 1860s through the 1890s in rural areas of the United States (indeed, this is a practice indigenous to that country), employing framemakers, photographers and 'folk art' painters whose portrait businesses had been driven into extinction by the cheaper and quicker tintype technology. The portraits that resulted have all the animation of a statue or wax effigy. This stiffness is not improved by the subsequent addition of paint, this being limited in colour range and usually covering whatever idiosyncratic detail may once have been present in the photograph. One consequence is that these portraits exhibit a certain sameness of expression, monotonous to a contemporary viewer but perhaps comforting to a clientele seeking familiarity of genre rather than artistic innovation. This clientele looks out at us from their standard gray backgrounds with the fixed stare of the blind, their facial and bodily comportment insisting above all on a dignified formality of presentation. Such formality is fitting for a procedure that may have only occurred once in a person's lifetime. In many of them the photographic base has been almost entirely covered by paint or, in the case of some of the backgrounds, erased through the application of a solvent. The resulting image was then often elaborately framed and matted, giving the final object both pattern and depth. This framing also allowed each example of an otherwise generic image-making process to take on a unique and distinctive appearance.

Painted photographs were also produced in India from the 1860s until the early twentieth century. Albumen and silver gelatin portraits were often covered in lavish and meticulous patterning and materials (including calligraphy and gold leaf) that transformed the perspectival space of the camera-picture into a flat, vertical surface.

Not much is known about the function of painted photographs in India, whether they were meant for the leaves of an album or a frame on a wall, for public or private space, although this form of portrait would seem to be an affectation adopted by the Indian ruling classes (similar pictures of Europeans living in India are unknown). If nothing else, their striking combination of local Indian painting traditions and a European image-form such as photography speaks to the tension generated when one culture seeks to accommodate the visual conventions, and political demands, of another.

We might look from India to Australia and find that paint was used to transform photographs there too. An albumen photograph was made to celebrate B.O. Holtermann's discovery of a gigantic gold nugget in 1873 after nine years of searching (he has helpfully added some relevant statistical information), a discovery which allowed him to go on to become one of Australia's most enthusiastic patrons of photography. What's strange about the addition of paint in this instance is that it turns what appears to have been a faithful record of Holtermann into an obviously fictitious scene, transporting him from the confines of a studio into a sweeping rural landscape. This landscape serves two functions: it claims to be the setting for Holtermann's discovery while also offering itself up as a prize that he can now acquire. Paint, it seems, helps overcome photography's obstinate realism, allowing fantasy full sway.

Memory and realism are uncomfortable bedfellows. Consider, for example, a cabinet card image of two sailors who worked on the Columbia River in Oregon in the 1880s, now held in the Stephen White Collection in Los Angeles. These sailors have obediently adopted the self-conscious poses one tends to adopt in a photographer's studio, each in uniform and with a hand in his left pocket, each gazing off over our right shoulder, as if looking out to sea, perpetually on watch for potential dangers. Anyone looking at this photograph in the 1880s would have known what we know—that these men are posing for a camera, pretending to be somewhere they aren't, sitting on an artificial rock in front of a painted backdrop. In this photograph, photography's realism is presented as an overt artifice.

What's interesting about this example, though, is that someone decided to play with this real artifice by adding a further bit of artifice of their own. For we can see that this someone has carefully painted in a piece of rope that starts from behind this photograph and then seemingly loops in and out of the right hand edge of the print, apparently puncturing it, before winding itself around a group of suitably nautical objects—a capstan, anchor and compass. This painted addition has a number of effects on the way we might read this picture. It merges the symbolic pictorial artifice of painting with the indexical reality of photography to produce a composite image that repeats and enhances the occupational themes expressed by both components. At the same time it draws attention to the reality of the actual photograph, to the physicality of the print before us, pretending to penetrate that print but also to hide behind it. So there's all sorts of play going on here with this photograph—it's being asked to act as a window onto another world set in the past, and simultaneously to declare itself to be a touchable and opaque object that has an edge and a thickness right here in the present, an object that is glued on to this board but also somehow stands away from it (such that the rope could be both behind and in front of it). This otherwise flat pictorial scene is anchored at its edges by a rectangle of ordinary thumb tacks that jut out from the cardboard mat, casting shadows back onto it and thereby giving this object a real, as opposed to an illusory, depth. If nothing else, the making of this object points to a critical, or at least skeptical, attitude to the photograph. It also provides evidence of a willingness to intervene to make this photograph a more compelling memorial experience. Indeed, it implies that, for the owner of this object, the photograph by itself was not able to provide a powerful enough memory trigger without this added enhancement.

Photograph albums could also be described as vernacular. Many albums are relatively banal depositories of carte-de-visite family portraits and pictures of celebrities. Some, however, show evidence of a strong degree of creativity on the part of their compilers. The album pages produced by English upper-class women in the mid-1860s, for example, rely on a remarkable degree of visual invention. They often combine an artful collage of shaped albumen prints with ink and watercolour drawings, sometimes arranged in rigidly symmetrical patterns and sometimes in a seemingly careless profusion of forms which recall contemporaneous trompe-l'oeil paintings or even the visionary fantasies of Lewis Carroll. The mechanical exactitude of the photographic portrait is transformed and elaborated into a personal tribute to these women's friends and family, and the desires and dreams associated with them. As with all collage practices, attention is drawn to the edges of each page's constituent images, disrupting the seamlessness of photography's representational claims to fidelity and realism as well as its role as an inscription of the past—these photographs are harshly located in the here and now of the page itself.

In the case of the Cator album, produced by an unknown member of that family, we find approximately 156 albumen prints have been mounted on its forty-six pages. These pages are often further decorated with ink illustrations and watercolour paintings. The album's cover is made from deeply carved wood, based on a geometric design of oak leaves and nuts. This cover speaks of the album's importance, as well as of its own

Englishness; it also creates a very theatrical entry to the pages that lie inside. The decoration on those pages often repeats their cover's overt appeal to nature, displaying detailed depictions of entwined blackberries, strawberries and even exotic lychie fruit encircling their photographs. Apart from these signs of an eternally fertile spring, the album maker is keen to emphasise family genealogies (adding names as ink captions to many of the portraits we find within). One page shows a collage of Cator family members facing us in front of a huge painted glass window, suitably framed by red curtains. Through the window we get to see an idyllic seascape occupied by two sailing boats. Another page shows a similar gathering in front of another huge piece of interior architecture, a fireplace. This scene of domestic bliss features an equally huge elliptical photographic portrait of a young child hanging over the mantlepiece in an ink frame while a more suitably-scaled dog curls up in front of the hearth. Some scenes are drawn from a more whimsical imagination. In one, the album maker has a man and a woman, each cut from a separate photograph, occupying a row-boat headed out to sea. But perhaps the most unusual image centers on a large jester figure dressed in a striped red, yellow and blue costume. With a sardonic expression on his face, the jester tosses eleven thumbnail-sized albumen portraits from his gathered apron, scattering them over the surrounding landscape like so much seed.

Vernacular photographic practices often took place in the home. In the years around the advent of the twentieth century, for example, it was not uncommon for women to turn their family snapshots into cyanotypes printed on cloth and then to sew them into pillow slips or quilts. One such pillow slip in the collection of Eastman House in Rochester, New York, consists of thirty of these blue images machine-sewn together, all but one showing typical outdoor scenes of the kinds everyone has taken on family holidays. Some feature male and female portraits, while others depict landscapes; one shows the interior of a house with its own complement of photographs sitting on top of a bookcase. Each image no doubt prompted a happy memory for the members of this family. But the pillow as a whole was also a reminder within the home of the outside world that it refers to, a constant reference to a picturesque elsewhere. The production of these kinds of photographic domestic keepsakes was encouraged by women's magazines of this period, and was influenced more broadly by an Arts and Crafts movement concerned to preserve hand-craft traditions in the face of expanding industrialisation. So the apparent ordinariness of this object belies the deeper social and cultural complexities embodied in its making. The physicality of this pillow's fabric, signalled in the unpredictable play of its straight seams and crumpled edges, is also a significant aspect of its capacity to induce a memory experience, giving these photographs substance and texture, making them touchable and warm, and allowing past and present to permanently cohabit as part of everyday domestic life.

These few examples are but the tip of an iceberg of vernacular photographic practices not often considered or even acknowledged in standard histories of photography. Although the emphasis here has been on practices that elaborate or add to the photograph, we could have as easily chosen to look at groups of unadulterated images drawn from advertising, ethnography, religion, pornography, science, leisure, journalism, criminology, tourism, business, government, or a host of other fields. What vernacular practices all have in common is that their photographs are typical and generic, rather than exceptional or innovative. They represent the visual culture of everyday life, sometimes poignant and creative but more often banal and utilitarian. Whether made by identifiable professional photographers or unknown amateurs, these are mostly conformist kinds of photographs, reproducing established social and aesthetic conventions in an effort to fulfill certain specific functions. These functions, ranging from the sentimental to the commercial, have little connection to the interests of high art. Nor do vernacular photographs lend themselves to the usual art historical systems of evaluation, based as these are on originality and rarity, masterpieces and great masters. As a consequence, if vernacular practices are to be included in photography's history, a whole, new way of doing that history will have to be devised.

GEOFFREY BATCHEN

See also: Calotype and Talbotype; Daguerreotype; Mounting, Matting, Passe-Partout, Framing, Presentation; Wet Collodion Positive Processes; and Albumen Print.

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VICTORIA, QUEEN AND ALBERT, PRINCE CONSORT

Victoria and Albert played an important role in the development of photography, most especially through being influential patrons during the 1850s. Upon the death of the Prince Consort in December 1861, Hugh Welch Diamond summed up their contribution to establishing the respectability of photography:

> As a manipulator in photography the Prince Consort was unsurpassed: in his practice of the art he was greatly assisted by his former librarian Dr Becker. . .Her Majesty is also a very good photographer. Certainly the art has no reason to complain of want of patronage and support from the Court; so extensive is the collection of negatives which have been taken by and for the Royal family, that it is necessary to have a private printer to keep them and print them when copies are wanted ("The Late Prince Consort and Photography," *Photographic News* 24 January 1862: 39).

Victoria and Albert's support existed firmly within the tradition of royal patronage of the arts. At the same time, though, as early practitioners, they epitomise the upper-class amateurs to whom photography was an affordable pastime. Royal support thereby stemmed from both a personal interest in the medium and a belief in its artistic and technological value.

The first ever photographs of the British monarchy were two daguerreotypes of Prince Albert that were taken by William Constable at Brighton on 7 March 1842. Later in the same month, Albert visited Richard Beard's daguerreotype studio in Parliament St., London. Other photographs taken during the 1840s included a series of daguerreotypes of the royal family by William Kilburn. Kilburn's success led to him being appointed "Photographer to Her Majesty and His Royal Highness Prince Albert." Many photographers subsequently went on to hold official warrants from the Court, including George Washington Wilson (1873) and André Disderi (1867), W. & D. Downey (1879), and Alexander Bassano (1890). Titles like "Photographer-in-Ordinary to Her Majesty" were attenuated versions of the appointments traditionally held by court painters: they demonstrate that traditional models of patronage continued to exist alongside the burgeoning mass market for royal photographs.

It was not until the early 1850s that Victoria and Albert became significantly engaged with photography. Prince Albert's interest in the union of art and manufacture fed naturally into his enthusiasm for the medium. Victoria's interest was more commemorative, founded around the camera's ability to record family occasions and events. Many early royal photographs were taken by Dr Becker, Prince Albert's librarian and a founding member of Royal Royal Photographic Society of London. Becker taught Victoria and Albert the calotype process and, although none of their photographs have survived, substantial amounts of photographic apparatus were supplied to Windsor Castle. A darkroom was built at Windsor in 1854 and, in 1857, the regular royal photographer, William Bambridge, was paid £643 3s 6d for his services.

The royal couple's association with Becker and Sir Charles Eastlake led to them becoming patrons of the Royal Photographic Society soon after its inception in 1853. They regularly visited its annual exhibition, purchasing pictures as well as aiding the society through their high profile presence. Notable photographs acquired for the Royal Collection include several copies of Oscar Rejlander's Two Ways of Life, and Henry Peach Robinson had a standing order from Prince Albert for a copy of every pictorial photograph he produced. In 1855, Albert also contributed £50 towards a study by the Royal Photographic Society into how to prevent the fading of photographs.

Victoria and Albert's patronage of the Photographic Society of London meant that they became acquainted with some of the most prominent photographers of the period. One typical example of the work carried out for the couple was a commission given to Francis Bedford by Victoria in 1857. Bedford was asked to travel to Coburg and take a series of pictures of Albert's homeland as a present for the Prince's birthday. Roger Fenton was another who took numerous royal photographs in the 1850s. These included a well-known set of Victoria's children in tableaux vivants in February 1854, and a series of pictures of Buckingham Palace, Windsor and Balmoral. Prince Albert also used his position to enable Fenton to obtain the necessary permission to take his Crimean war photographs. These were eventually published as *Dedicated by Special Permission to Her Most Gracious Majesty the Queen, Photographs by Roger Fenton Esq. M.A. of the Seat of the War in the Crimea* (1855). At the wedding of the Princess Royal in January 1858, T.R. Williams was requested to take a series of daguerreotypes. It is important to emphasise the photographs taken during this period were never intended for publication and were all private commissions by the royal family.

As well as Victoria and Albert's domestic use of photography, they continued to give public support to the medium. At the Art Treasures exhibition in Manchester, opened by Albert in May 1857, numerous photographs and paintings were lent from the Royal Collection. It

was also the first occasion that photographs of members of the royal family were put on public display. Pictures of both Albert and the Duke of Cambridge were amongst the exhibits. William Lake Price specifically took a portrait of Albert for the exhibition, probably as a sign of his approval and encouragement of the event. In 1852, Albert also initiated a project that would use photography to copy all the extant Raphael paintings and drawings, both in the Royal Collection and elsewhere. Photographers involved in the Raphael project included Rejlander, Philip Delamotte, and William Bambridge.

The death of Prince Albert coincided with the advent of the celebrity *carte-de-visite* and the growing market for celebrity photographs. These two events caused a fundamental change in the relationship between the monarchy and the camera. From being significant patrons, members of the royal family became valuable sitters who were much sought after by commercial studios. Patronage did continue in that the Prince of Wales, for example, became President of the Amateur Photographer's Association in September 1861. Victoria also maintained her strong personal interest in photography, particularly when it came to using pictures of the dead Prince as objects of mourning. She also accumulated many albums of pictures that document both her burgeoning extended family and the contents of the various royal palaces. However, after the early 1860s, royal photographs moved uneasily between being family pictures and media images. Photographers exploited the monarchy rather than relying on it for support.

JOHN PLUNKETT

See also: Diamond, Hugh Welch; Beard, Richard; Kilburn, William Edward and Douglas T.; Wilson, George Washington; Disdéri, André-Adolphe-Eugène; Photographic Exchange Club and Photographic Society Club, London; Downey, William Ernest, Daniel, & William Edward; Bassano, Alexander; Calotype and Talbotype; Eastlake, Sir Charles Lock; Robinson, Henry Peach; Rejlander, Oscar Gustav; Bedford, Francis; Fenton, Roger; Williams, Thomas Richard; Daguerreotype; Price, William Lake; and Delamotte, Philip Henry.

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VIDAL, LEON (1833–1906)

Leon Vidal is not well known today but during the latter half of the nineteenth century was heavily involved with public photographic display, instruction in photography, promotion of photography and the development of photographically linked printing processes in France. He published numerous books that covered topics in all these areas.

Vidal was born near Marseilles. His parents owned a salt works at Port du Buc nearby. He was educated at the Lycee St. Louis and the Sorbonne in Paris, majoring in engineering. He moved back to Marseille and became active in photographic endeavors. He invented the Autopolygraph, one of the first automatic photographic plate-changing magazine-type cameras, in 1861. He met Poitevin and edited his works for publication. Also in 1861 in Marseille he founded, published and edited the journal "Le Moniteur de la photographie," which he continued to do for the rest of his life, taking it with him to Paris when he moved there in 1875.

Perhaps the most beautiful, if not the most influential work by Vidal was his devising of a color photographic printing process in the early 1870s he called "photochromie," a term unfortunately used for a number of other processes, and as a general term for color photography around that time in Germany. His process was a three-color separation process printed on a Woodburytype black layer. It was put into use in Paul Dalox's Tresor Artistique de la France, Musee National du Louvre, Gallerie d'Apollon (Imprimerie et Librarie du Moniteur Universelle, Paris). The first volume appeared in 1872, the second in 1875. Copies of these volumes are held, among other places, in the collection of the Getty Research Institute. They are folio size. The images, while not extremely high resolution, look quite sharp. They appear to have almost the look of lacquer in their finish. They reproduce colors very well, with a somewhat cold tone. They shine (literally) in their reproduction of metallic surfaces. Each object is posed in rather even illumination in front of a uniform background. Some of the most outstanding images are the Casque de Henri II (Helmet of Henry the Second) in volume I, and the Epee de Charlemagne (the Dueling Sword of Charlemagne), Boite de Evangeliaire (Box of the Evangelist), and the Statue Equestre (Statue of the Equestrian), in Volume II. Reproductions of decent quality are to be found in *Farbe im Photo*, 204 and 207. The colors are good, but the surface luster of the original is absent. Of course, the photographic three color separation process was demonstrated in a famous experiment using projected lantern slides by Maxwell in 1861, envisioned in various

forms by Ducos du Hauron in his papers and patents in 1867–9, and was tried by many people. However, Vidal's addition of black as a fourth color seems to have been an important contribution.

Vidal published frequently. His books include: *Calculation of Exposure Times* (*Calcul des temps de pose*, 1865, 1884), *The Art of Photography Considered from the Industrial Point of Vie*w (*L'art Photographique considere au point de vue industriel*, 1868), *Practical Treatise on Carbon Photography* (*Traite pratique au photographie du charbon*, 1877), *Practical Treatise on Phototypie* (*Traite pratique de Phototypie*, 1879), *Photography Applied to the Industrial Arts of Reproduction* (*La Photographie appliquee aux arts industriels de reproduction*, 1880), *Practical Treatise on Photoglyptie* (*Traite pratique de photoglyptie*, 1881), *Practical Manual of Orthochromatism* (*Manuel pratique d'orthochromatisme*, 1891), *Color Photography* (*Photographie des Couleurs*, 1897).

He also sat on and wrote or edited reviews and jury results at a number of exhibitions and conferences. Some examples are: Rapport du Jury classe X, Exposition Internationale des Sciences et des Arts Industriels, 1886, La Photographie a l'exposition de 1889, Rapport du jury internationale, classe 12, Exposition Universelle Internationale de 1889, Discourse on photogravure and photochromographie at the Exposition Internationale de Photographie de 1892, Rapport du jury internationale, classe 12, at the Exposition Universelle in Paris, 1900, as well as a major portion of the Musee Retrospectif de la photographie a l'Exposition Universelle de 1900 (reproduced in Bunnell, P.C., ed., *The Universal Paris Exposition of 1900: Two Catalogs*, Arno Press, 1979).

In his book on Orthochromatism cited above Vidal reproduces opposite the title page three images of the same mixed-flower bouquet, taken with black and white film through three different color filters. In each one almost every bloom takes on a different shade from white to black, illustrating that the varied sensitivities of black and white film create an illusion of reality in the final image, which does not correspond to the truth. Only panchromatic film can capture the entire spectrum we see. Vidal quotes Hermann Vogel, the discoverer of photosensitizing dyes as his opening text. Vidal also provides one of the earliest compilations of sensitometry curves on pages 36 and 37, taken from the work of Josef Eder and others. There you can see the dyes with the farthest reach of sensitivity in the red are quinoline red and cyanine. These represent among the first of their chemical family, one that is still important in film sensitization.

Vidal taught at the Conservatoire des Arts et Metiers in Paris, in Limoges, and occasionally in Marseilles. He was an active member of the Societe francaise de photographie. He traveled to the International Photography Congress held at the 1893 Columbian Exposition in Chicago. There he proposed an idea for a museum of documentary photography. Later that he year he founded the Association du Musee de Photographies Documentaires in Paris.

He was an officer of Public Instruction and made a Chevalier of the Legion of Honor (Chevalier de la Legion d'Honneur).

In the *Moniteur de la Photographie* he wrote (no. 23, Feb. 15, 1866, 178–180 and no. 24, March 1, 1866, 186–88) "We want photography, so useful to all branches of knowledge, to become the domain of everyone…Industry should aim to make photography for everybody as mechanical as possible in use." He certainly did all he could throughout his life to make this wish to come true.

WILLIAM R. ALSCHULER

See also: Poitevin, Alphonse Louis; Woodburytype, Woodburygravure; Expositions Universelle, Paris (1854, 1855, 1867 etc.); Vogel, Hermann Wilhelm; Eder, Joseph Maria; and Société française de photographie.

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VIENNA INTERNATIONAL EXHIBITION AND VIENNA TRIFOLIUM (1892)

The Vienna International Photography Exhibition, Ausstellung Kunstlerischer Photographien, was held in Vienna from April 30 to May 31, 1891 [*The American Amateur Photographer*, Jan. 1891, 34] under the patronage of Archduchess Maria Theresia, and sponsored by the Club der Amateur-Photographien under the direction of Carl Srna, Dr. F. Mallmann, and Carl Ulrich.

Much of the event's importance revolved around the organizers' decision to limit the exhibition solely to artistic photography to the exclusion of technical

and scientific applications of the medium. Fittingly, it was juried by imminent members of Vienna's fine arts community who selected for display six hundred photographs by one hundred and seventy-six persons.

Among the eleven-member panel were Henry von Angeli, professor at the Imperial and Royal Academy of Arts, Vienna; John Benk, sculptor; Julius Berger, professor at the Imperial and Royal Academy of Arts, Vienna; K. Karger, professor at the Imperial and Royal School of Art-Industry, Vienna; Fritz Luckhardt, professor, imperial councilor, photographer to H.I. Majesty the Emperor; and Augustus Schaeffer, director of the Imperial Picture Gallery, Vienna. [*Am. Journal of Photography*, March 1891, 124] The preponderance of painters among the jury members drew criticism from the ranks of photographers who called for a more balanced representation.

The strategy initiated by the Vienna Exhibition established it as the first international group show dedicated to collecting the best aesthetic photographs, and one which recognized its creators without the use of traditional prizes and monetary awards that had come to be looked upon as undesirable methods of reward since the Pall Mall Salon in London. Underscoring the event was the Secession movement and its emphasis of art photography as opposed to scientific recording, leading to the formation of camera clubs devoted to advancing aesthetic production.

Its organizers carefully orchestrated the promotion and direction of the exhibition using considerable foresight to be the first to include the younger generation of photographers who were rising through the ranks. From America, there were ten appointees out of a field of forty. From New York City, the works of Alfred Stieglitz, James L. Breese, Miss Mary Martin and Henry B. Reid were represented. Others from New York State included John E. Dumont, Rochester and H. McMichael from Buffalo. Philadelphia's most promising young photographer, John G. Bullock, was selected along with George B. Woods, from Lowell Massachusetts, and Chicagoan Mary A. Bartlett [*Anthony's Photographic Bulletin*, June 27, 1891, 355].

The prominent British names were naturally given strong representation at the Vienna Salon. In fact George Davison was the star with eighteen pictures, followed closely by Henry Peach Robinson with fourteen works, suggesting that the eleven jurors were able to discern the key aesthetic currents—pictorialism and constructed art photography—and give them equal consideration. Frank M. Sutcliffe, although a seasoned professional, chose to be listed as an amateur and was exhibited beside the vast majority consisting of amateur ranking.

From Germany, a list of those photographers whose works were represented by fifteen or more photographs included Moritz Hahr and N. von Rothschild. Equally, distinction was given to works by the then prominent Countess Loredana da Porto Bonin.

The Austrian photographers played an important role at the Vienna Salon and continued to advance the photography Secession movement throughout the 1890s. Begun the same year of the exhibition, the Wiener Kamera-Club (Vienna Camera Club) promoted the tenets of art photography and was the artistic counterpart to the technically oriented Photographische Gesellschaft in Vienna. During the decade, the Weiner Kamera-Club published two journals, *Photographische Rundschau* and *Wiener Photographische Blätter* featuring some of the most beautifully executed photogravures.

An early member of the Wiener Kamera-Club was Hugo Henneberg. Through his association with French photographer Robert Demachy and the English photographer Alfred Maskell, Henneberg brought the gum bichromate process to the attention of his Austrian colleagues, Heinrich Kühn, and Hans Watzek. Henneberg's work most closely resembled the pictorial style of George Davison, then the only British member of the Kamera-Club in Vienna. Henneberg was Alfred Stieglitz's first contact in Vienna and the two had corresponded since 1890. In 1894, Stieglitz became a member of the Wiener Kamera-Club presumably at Henneberg's suggestion. In subsequent years, Stieglitz featured works by the Austrian photographers at his Photo-Secession Galleries in New York.

Early in 1896, Henneberg, Kühn, and Watzek began experimented with colored gum-bichromate prints making remarkable creative color constructions using up to three colors. Influenced by Impressionism's rejection of the objective in favor of visual impression, and motifs and methods of composition shared by contemporary painters of the Munich Secession, the group transformed masses of light and shadow to make pictures whose eminent qualities of mood prevailed over realism.

Associated with progressive art theories of the late nineteenth century, the group's artwork was featured early in 1898 along with all the other innovative arts when the Vienna Secession published the first volume of its journal *Ver Sacrum*. Calling themselves the Trifolium, Henneberg, Kühn, and Watzek exhibited together in the photographic section of the Munich Secession international exhibition in the fall of 1898. By this time their association led them to sign their prints with a cloverleaf monogram near their signature to symbolize the Trifolium. In the subsequent years following the Vienna Salon, Henneberg, Kühn, and Watzek submitted their photographs to salons in Paris and London. The three also became members of the prestigious British photographic association, the Brotherhood of the Linked Ring.

The Vienna International Photography Exhibition was perhaps the most successful and influential force

for drawing attention to photography's aesthetic role and affecting a shift within the industry toward art photography. Ideas emanating from the landmark exhibition established a model for a long string of salons that admitted only art photography and excluded technical and scientific work.

The rigorously juried international exhibition set a higher standard that would be applied to subsequent international and regional exhibitions. The consideration of photography as an art form versus a scientific tool of reportage prompted the formation of separate camera organizations devoted solely to art photography. The following year, in 1892, the Linked Ring was formed in Great Britain. The Photo-Club de Paris began in 1894. In America, Alfred Stieglitz followed the movement of secession from traditional photography societies when in 1902 he formed the Photo Secession group in New York. Intrigued by the Trifolium's identity, Stieglitz arranged to present the three in America. Their work came to stand for what most Americans would know of Austrian Secession photography.

MARGARET DENNY

See also: Photographische Rundschau; Stieglitz, Alfred; Watzek, Hans; Kühn, Heinrich; Brotherhood of the Linked Ring; and Photo-Club de Paris.

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VIEWING DEVICES

The origin of photographic viewing devices can be traced to the eighteenth century, when a 'show box,' or 'peep box' was employed to enhance the sense of depth within hand coloured engravings, thereby generating a more realistic viewing experience. Such devices tended to be of a basic construction where the viewer would look with both eyes through a single glass lens built into the front of a box which magnified the image. A similar effect was achieved using another eighteenth century device known as the Zogroscope. This consisted of an adjustable stand with a mirror and single large lens attached. The engraving to be viewed was placed upside down in front of the viewer. The Zogroscope was then placed alongside the engraving. The engraving would then appear reflected in the mirror, through the lens, the correct way up and hopefully with an added sense of realism. How effective such devices were is debatable, but the use of viewing devices, in one form or another, continued with the advent of photography. Early photograph collectors were often also collectors of engravings, and some viewed their newly acquired photographs in the same way they had always viewed their engravings. Viewing devices therefore form a link from the pre-history of photography through to the advent of photography itself.

In time, viewing devices became more elaborate. In 1862 the photographer, Carlo Ponti (1823–1893) took out a patent in England for his Alethoscope. This had a single magnifying lens intended for the viewing of large photographic prints showing architectural views of Italy. Ponti's imposing optical devices later came to be known under a variety of names, including the Megalethoscope, Dioramascope and Pontioscope. Ponti also made the impossible claim that his devices were able to show single photographs with a stereoscopic effect.

It is important to acknowledge the sheer variety of viewing devices that were produced throughout the nineteenth century, some of which were more successful than others. For example, in the 1870s Francis Frith & Co produced a series of large format photographs on coloured transparent paper. Entitled, Photoscopic Pictures, these look, from their design, as if they were intended to be viewed in a device similar to Ponti's Megalethoscope, but little mention is made of them nowadays.

At the opposite end of the scale are Stanhope viewers. Named after the English politician and scientist, Charles, Earl of Stanhope (1753–1816), these viewing devices can be found embedded in a wide range of small novelty articles: from needle holders to letter openers. They consist of microphotographs fixed to the flat end of a tiny glass rod, while the other end of the rod is curved, so that when the one peeps through the Stanhope viewer the microphotograph appears much enlarged through the convex lens at the other end.

In 1864 Charles Rowsell produced a device capable of handling stereoscopic photographs as well as single prints. The Graphoscope's mainly wooden construction comprised of a moulded rectangular plinth which supported a hinged platform which could be adjusted to various angles to aid the viewing of images through either a pair of inset stereo lenses, or a larger single double convex lens glass. The double convex lens was said to produce an illusion of relief, rather than a fully realised stereo effect. In an advertisement for the photographic supplier, P. Meagher from 1875 the Graphoscope is described as a device 'For viewing photographs, drawings and stereoscopic pictures on glass or paper. By a simple adjustment of the easel the instrument is readily focused to suit any sight."

Perhaps the most obvious example of a device designed to generate a realistic viewing experience is the stereoscopic viewing device, without which a

stereoscopic photograph stubbornly remains two-dimensional. However once seen though the correct viewing device the image is miraculously perceived in three dimensions. Such viewing devices therefore have the power to convert two separate, flat photographic images into one single three-dimensional image.

The first system capable of producing a photographic stereoscopic image is credited to Sir Charles Wheatstone (1802–1875). He successfully described the theory of stereoscopic vision and invented a device, known as a Wheatstone Reflecting Stereoscope, through which two large, separate photographic images could be simultaneously viewed in order to produce a single stereoscopic image. It was the first practical stereoscope, and because it was capable of accommodating large photographic prints (up to 27 × 40 cm each) it was particularly suited to the photographic connoisseur. Both Roger Fenton (1819–1869) and Benjamin Brecknell Turner (1815–1894) produced Wheatstone stereo images.

Stereoscopic photography was not introduced on a mass scale until the 1850s, when demand for images for use in Sir David Brewster's (1781–1868) Refracting, or Lenticular Stereoscope grew. Commercially produced by Louis Jules Duboscq in 1851, Brewster's system used two photographs taken of the same object from slightly different viewpoints at exactly the same time. This was an improvement on the stereo images created using Sir Charles Wheatstone's stereo pictures which were usually created using a single lens camera which had to be moved between two consecutive exposures. The difficulty in producing the stereoscopic image for Wheatstone's system was mirrored in the viewing device. The Wheatstone Reflecting Stereoscope was a rather insubstantial affair constructed from strips of wood and two mirrors set at an angle of 45° which resulted in an awkward and uncomfortable stereo viewing experience. Brewster's system, on the other hand, produced a handsome design which was much being better suited to a Victorian drawing room. It also produced a more effective, or pleasing stereoscopic effect.

Antoine Claudet's Folding Stereoscopic Viewer appeared on the market around the same time as Brewster's pattern for a Lenticular stereoscopic viewer. Claudet's design was the more limited of the two, as it came with a single stereo daguerreotype permanently built into the viewer. Its collapsible design meant it could be stored flat, however, Brewster's design proved to be more adaptable and formed the basis for most of the popular stereoscopic viewers that followed, and became the viewer of choice in the craze for stereoscopic images that was to continue into the latter part of the century.

Stereoscopic viewers based upon Brewster's pattern were popular throughout the 1860s and were known as Box Form stereoscopes. These simple hand-held devices, capable of holding one stereoscopic photograph at a time, were often highly decorated in keeping with the setting of the Victorian parlour. The stereo card fitted through a slot at the back of the device, while a mirrored flap could be raised and angled so that light was cast onto the stereo card thereby giving enough light for it to be viewed through the twin lenses at the front. The back of the stereo viewing device was often fitted with a ground-glass panel which allowed diaphanous stereo cards manufactured on hand coloured tissue paper also to be viewed, alternating between night and day, summer and winter, simply by raising and lowering the mirrored flap on top of the viewer.

In America, Dr Oliver Wendell Holmes devised a simplified stereo viewer in 1861 which is probably the design most people think of today when they imagine a nineteenth century stereoscope. It consisted of a wooden hood-like arrangement which covers the viewer's eyes, with a holder for the stereo card fixed at a set distance from the hood. This design was improved in 1864 by another American, Joseph L Bates of Boston, when he added an adjustable sliding holder for the stereo card, thereby making it possible for the instrument to be adjusted to suit the individual and maximise the three-dimensional effect.

More ornate 'pedestal' stereo viewers were manufactured by companies such as Negretti & Zambra. Although the actual stereo viewer was simple in design, and similar to the box form stereoscope described above, they were often constructed from high quality wood veneers and incorporated highly decorative figurative sculptural elements in the base. The third, and most substantial type of stereo viewer dating from this period and intended for use in the most lavish Victorian parlour setting was in the form of a cabinet. These cabinet stereo viewers were capable of accommodating a selection of up to twenty individual stereo view cards at the same time which moved through sequence on a carousel inside the cabinet.

The fact that companies such as Underwood & Underwood could produce up to ten million stereoscopic views a year in order to meet the Victorian parlour's huge demand for photographic images I order to ensure its viewing device was well stocked with photographic images is testimony to the importance of this sector of the photographic industry in the nineteenth century.

BRIAN LIDDY

See also: Ponti, Carlo; Frith, Francis; Stanhopes; Wheatstone, Charles; Turner, Benjamin Brecknell; Duboscq, Louis Jules; and Claudet, Antoine-François-Jean.

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VIGIER, LE VICOMTE JOSEPH (1821–1894)

Louis Jules Achilles Vigier, known as Joseph Vigier, was Viscount, owner of the castle of Grand-Vaux à Savigny-sur-Orge. School-fellow of the duke of Aumale at the school Henri IV, he remained connected all his life to the family of Orleans. In 1872, after having sold his Grand-Vaux à Savigny-sur-Orge, he acquired the castle of Lamorlaye, close to Chantilly, where the duke of Aumale remained and where he could appease his passion for horses (developed with his training of thoroughbred racehorses of English origin).

Vigier was introduced to photography in the workshop of Gustave le Gray around 1848–1850. He first stayed in Seville in 1851, in the home of the duke of Montpensier; it is not known if he took photographs there. In September 1852, he went to England and took photographic portraits of the royal family in exile in Claremont: King Louis-Philippe, the queen Amélie, their children (duke of Nemours) and grandchildren posed, each one sitting upright or close to a table, some in front of a fabric painted with the exuberant decoration of flowers; the prince of Condé is illustrated on a horse. In the summer of 1853, he voyaged to Spain while passing by the Pyrenees (Luchon, Cauterets, Pau), from which he brought back several hundreds of scenes on negative paper. At the end of the year, he published the Album des Pyrénées (Album of the Pyrenees), which was a collection of about thirty prints. In February 1854, he showed six of them in London, with the Exhibition of Photographic Society, which created enthusiasm in the public and queen Victoria.

Vigier was the founding member of the Société héligraphique in 1851, then of the Société française de photographie in 1854 (he remained there until 1862); he was also member of the board of directors of the SFP from 1857 to 1862. He took part in the first two Exhibitions that the Society organized, in 1855 (views of the Pyrenees) and in 1857 (views of Dauphiné of 1855 on negative paper, a castle of Savigny of 1856 on dry collodion, a horse according to nature on wet collodion). He also took part in several Exhibitions in London (in 1852, Society of Arts, and in 1854 in Photographic Society) and in Brussels in 1856 (views of the Pyrenees and views of Dauphiné, on negative paper; portraits, monuments, horse on collodion; monuments and views of France, England, Spain on albuminous paper and waxed paper). The birth of a son in 1859, the management of his grounds, voyages, passion for the horses, and especially the evolution of the photographic processes in the years from 1860 diverted him perhaps definitively from his practice.

A major figure of the photo hobbyists of the 1850s, the personality and oeuvre of the Viscomte Vigier are still

Vigier, Vicomte Joseph. Path to Chaos, Saint-Sauveur. *The Metropolitan Museum of Art, Gilman Collection, Gift of The Howard Gilman Foundation, 2005 (2005.100.503.8) Image © The Metropolitan Museum of Art.*

not well-known. His body of work is for the moment only partially identified: portraits of the family of Orleans went on public sale in 2000, and especially scenes of Spain (Seville, Grenade) and of the Pyrenees, preserved at the SFP, the BNF, the Museum of Orsay (this last preserves the album of the Pyrenees, and the views captured in the Brébisson album). Because of his participation in two London Exhibitions, Vigier was apparently better known by the English public. It may be also that he met English amateurs at the time of his stay in the Pyrenees. His affinities with England are perhaps at the origin of his interest for Talbot's calotype process, which he used in alternation with the process of Le Gray (waxed paper). He considered the two techniques complementary, finding it easier to use Talbot's in particular for the impression, whereas that of Le Gray's, which gave more definition, of transparency in the shades, of truth in returned space. He sought to improve the processes on paper and communicated with the SFP on this subject in 1856. Vigier used the collapsible darkroom of Koch and resorted, for his printings, to the photographic printing works of H. Fonteny, directed by Alexandre Lachevardière, in Paris, principal rival of the printing works of Blanquart-Evrard. He signed his tests with a dry seal with his monogram, JV, surmounted by a crown. Negative paper agreed well with the primitive aspects of certain landscapes like arid valleys and rocks, and captured the textures of the rock and stone because of those atmospheric effects. The tones are warm, of a beautiful colour varying from pink to brown. His images are often very composed, with sets of lines, right-hand sides or curves (road, bridge), introducing a movement, making space and giving to the spectator the feeling of being in the scene (Sentier du chaos allant de Gavarnie à Saint-Sauveur). The foreground is often released (road, river, way) and the background occupied by a thrust created by a mountain or a church (Bridge of Slate with Luchon).

With their public appearance, the photos of the Pyrenees achieved the unanimous acclaim. With the occasion of the Exhibition of London in February 1854, the critic Ernest Lacan devoted an article to the album of the Pyrenees, in which he emphasized the difficulties encountered in traversing the various sites; he underlined the transparency, the strength of the tone of these images as well. In 1855, Eugene Durieu admired those same views, and in 1857, Paul Perier remembered their "broad and severe character." With the Exhibition of 1857, in front of a sight of castle in Dauphiné, Perier spoke about smoothness and frankness from execution: "the light was so fortunately chosen, that water, of a curious transparency, has their value everywhere, and is harmonized very well with all the other parts of the table. The avenue of trees of the castle of Savigny is not less remarkable; the foliage is returned perfectly, and the table has much of depth without presenting the exaggeration of prospect which often the avenues in photography give." By the masterly character of these tests, without anecdote nor picturesque, Vigier occupies a singular place in the production of the amateurs of the 1850s.

HELENE BOCARD

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VIGNES, LOUIS (1831–1896)

French, active in Morocco, Sicily, Lebanon, and Palestine 1859–1864, photographer, naval officer

Vignes was a distinguished naval officer whose photographic work is limited to his early service in the Mediterranean and North Africa. He entered l'Ecole navale in 1846 and remained in the French Navy, retiring as an admiral. It is unclear where he learned photography, but he made over 50 calotypes of sites in Morocco, Sicily, and Beirut during the Syrian campaigns of 1860. It was this experience that led to his assignment to the archaeological expedition mounted by the Duke du Luynes, an eminent biblical archaeologist with an interest in photography. The group traveled from Beirut south through Sidon, Tyre, Nablus, and Jerusalem to the Dead Sea which they explored by ship from March through May of 1864. Vignes photographed throughout the journey, initially with collodion on glass at du Luynes behest. He returned to the calotype process he had used in Syria on the return journey, perhaps because the supply of glass plates had been exhausted. While there is no complete tally of photographs from this expedition, it may be estimated at 400. Sixty-four photographs were published by Charles Negre using his photogravure process to accompany, *Honoré d'Albert, duc de Luynes, Voyage d'exploration à la mer Morte, à Pétra et sur le rive gauche du Jourdain*, Paris, 1875. In addition there are a number of albums in public and private collections that include material not found in the publication—in addition to archaeological subjects, panoramas, interior views in French residences, and landscape studies.

KATHLEEN HOWE

VIGNOLES, CHARLES BLACKER (1793–1875)

Charles Blacker Vignoles was born in 1793 at Woodbrook, Ireland. His parents were Captain Charles Henry

Vignoles and Camilla Hutton, daughter of Dr Charles Hutton of Woolwich. A Civil Engineer with a wide range of interests, he was engaged in Railway Engineering in England, Ireland and on the Continent of Europe.

Vignoles was a founder member of the Royal Photographic Society, and was an early advocate of the use of photography as a means of recording construction activities.

In 1848 he employed John Cooke Bourne and in 1852 Roger Fenton to take record pictures of the Tsar Nicholas I Chain Bridge which he was constructing at Kiev.

In 1859 he encouraged John Watson, the contractor on the Bahia and San Francisco Railway in Brazil to employ a photographer to record the progress of the works. From 1859 to 1862 this was carried out by Benjamin Mulock.

In 1860, while working in Northern Spain, he facilitated an expedition to view the Eclipse of the Sun, when Warren de la Rue photographed the Corona for the first time.

President of the Institution of Civil Engineers from 1870 to 1872, Vignoles died in Southampton in 1875.

JOHN VIGNOLES

VILLALBA, RICARDO (active 1860–1880)

Ricardo Villalba (sometimes spelled Villaalba), was active in Perú and Bolivia, between 1860 and 1880. He may have been born in Corocoro Bolivia, but very little is known about his life. Villalba's images are found on cartes de visite and cabinet cards and his albumen prints include views of the Peruvian Southern Railroad, Lake Titicaca and the devastating 1868 earthquake of Arequipa and Arica. During the 1870s, Villalba had a studio in Arequipa and is thought to have been the first to photograph the city's famed volcano, El Misti. When Villalba left Arequipa, his studio and perhaps some of his negatives may have been acquired by the photographer Carlos Heldt. According to Dan Buck, Villalba relocated to Paris in the 1880s, where he was listed as a member of the Societe Francaise the Photographie. He also submitted several photographs for an exhibit sponsored by the Photo Club de Paris in 1894.

The Harvard Peabody Museum owns a Villalba album containing ethnographic cartes de visite of Bolivians. There are also over thirty Villalba photographs in the James Maxwell Collection at the University of Delaware. The ENAFER Corporation in Perú owns an album of images of the Ferrocarril del Sur (which ran from Mollendo to Puno). The William Darrah Collection at Penn State contains one carte de visite (c. 1872) of a sunken ship off of the port of Callao (near Lima). On this card the photographer's name is spelled Villaalba.

YOLANDA RETTER VARGAS

VOGEL, HERMANN WILHELM (1834–1898)

German inventor, photographer

There are not many 'firsts' in the history of German photography but there is one man who collected most of them: he wrote the first thesis on photo-chemistry in German language; with the Photographische Mitteilungen, he founded one of the first and most lasting periodicals; he gave photography the "second half of light" (J.M. Eder, 1880) by finding the substances for the colour sensitisation of photographic plates. In the German speaking countries, he was the first to criticize an exhibition at length, and among the firsts to curate another one, dedicated to the aesthetic qualities of photography gained throughout the first 25 years of existence. Hermann Wilhelm Vogel was a remarkable thinker about photography whose interests were as wide-spread as the medium itself:

> Thus we see photography active into the most diverse directions. Animals, plants, minerals have to draw their images onto the light sensitive plate as well as the products of art and industry, and as the motions of the barometer and thermometer. The photographer directs his instrument into the icy regions of the North Pole as well into the thicket of the tropical jungle; into the gorges of our high mountains as well as into the depths of the endless universe. His art is applicable to all branches of human knowledge and wisdom. There is no field in the great world of the visible where it [photography] could not be introduced fruitfully; it is shaping the history of towns and countries, and when we will be no more existant, our photographs—more loquacious the all historical works—will tell the cultural history of our time to our successors. (Hermann Wilhelm Vogel, Die Photographie auf der Londoner Weltausstellung des Jahres 1862, Braunschweig 1863, 28)

Neither photography nor fame were laid in his cradle. Hermann Wilhelm Vogel was born in 1834 in the small town of Dobrilugk (today: Doberlug-Kirchhain) fifty miles southeast of Berlin. He was the son of a material merchandiser who wanted him to follow in his footsteps, and so young Hermann became an assistant sales agent at the age of fourteen. In 1850 he finally managed, according to records, with the help of some of his father's friends, to inscribe at the trade school in Frankfurt/Oder which had a technical department. From 1852 to 1858 Vogel visited the technical school at Berlin, then the best-known institute for all kinds of applied science. After finishing this institute with a diploma in 1858, he was installed as a scientific assistant at the Mineralogical Museum of the Berlin University. It was there that he finally met his life-long interest: photography.

Two influences can be reported for this determination: At the Museum he had to reproduce cuttings of rock with the aid of photography, and a friend from the technical school, the architect Albrecht Meydenbauer,

asked him to help with advice for the setting-up of a photogrammetic inventory of buildings ready for preservation and reconstruction. Besides his work at the Mineralogical Museum, Vogel managed to write a thesis on the behaviour of silver halides under conditions of light which was finished by 1863. Later in the same year, he was named head of a newly established photographic laboratory of the Berlin technical school where he had studied before. This laboratory was opened in 1864, and from then on Vogel unfolded a wealth of activities within all fields imaginable in photography. In 1879, the Berlin technical school and the building academy were unified to the Technical University where Vogel was made Professor in Photo-Chemistry, a position he held until his death in 1898. The chair gained world-wide fame, and Vogel was succeeded by Adolf Miethe, Otto Mente, and Erich Stenger, each of them outstanding in their own fields.

Hermann Wilhelm Vogel's most important contribution to photographic chemistry and industry was the sensitisation of the emulsion for larger parts of the spectrum. In 1873, he described the enrichment of photographic emulsions with eosin dye pigments for dry plates which were to be named orthochromatic. As a typical product of the science of its time, his findings were easy transferrable into industrial use, and the benefits of Vogel's plate sensitisation helped the German photographic industry to both develop and achieve world-wide acclaim. As orthochromatic emulsions lacked sensitivity for red colours, Vogel continued this part of his research until his death. Adolf Miethe, his successor in the Berlin seat, was lucky to announce in 1902, four years after Vogel's death, the introduction of the panchromatic sensitisation which not only gave black & white photography a perfect gray scale for all colours but set the foundations for today's colour photography as well.

As head of the only department of photo-chemistry in Prussia, Vogel was a major influence in the development of German photography. He set up the first comprehensive exhibition of photography in Berlin in 1865 and organized the medium's half-centennial in 1889. While setting up the first exhibition, he stimulated a legal debate on photographic copyrights, a law installed with his help in Germany by 1897. For a gathering of photographers at the exhibition in 1865, Vogel co-authored a dramatic comedy in two sets. As a member of the jury, he took part in the preparation of the photographic departments of the world exhibitions in Paris 1867, Vienna 1873, Philadelphia 1876, and Chicago 1893. He instigated not only the career of master scientists like Miethe and Mente but of photographers as the young Alfred Stieglitz alike. He wrote a number of books, among them a four-volume comprehensive handbook of photography whose fourth part is the first overview on the medium's aesthetics in German language—and contains a chapter on reproducing sculpture which changed the views of art history. Vogel led photographic expeditions to view solar eclipses and to archaeological sites all over the world, and he brought home not only masses of scientific results but landscape and travel photographs as well. His own photographic work has still to be unravelled from the huge amount of records he left behind at his untimely death in 1898.

ROLF SACHSSE

Biography

Hermann Wilhelm Vogel, born in Dobrilugk, Lausitz, March 26, 1834. As the son of a merchant, he had to leave school at the age of 14 and became the assistant of a sales agent. From 1850 to 1852 he visited the trade school at Frankfurt/Oder, from 1852 to 1858 the industrial school at Berlin. From 1858 to 1864 he worked as a scientific assistant at the mineralogical museum of the University of Berlin, in 1863 he finished his doctorate on the theory of photography which is considered the first scientific work in German photo-chemistry. In 1864 he founded the photographic laboratory at the Berlin industrial school which was transferred into the Technical University in 1879. From then until his death on December 17, 1898, in Berlin, he was Professor and head of the Department of Photo-Chemistry in this institution.

See also: Miethe, Adolf; and Stieglitz, Alfred.

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VON ETTINGSHAUSEN, ANDREAS RITTER (1796–1878)

Austrian mathematician and physicist

Ettingshausen was born on 25 November 1796 in Heidelberg, where his father was stationed during the first World War as a member of the Austrian general staff. After the relocation of the family to Vienna in 1809 and the completion of high school he turned to a career as

an officer. In 1815 he turned to a scientific career too. When he entered the scene of Austrian photo history in 1839. He was among the most renowned scholars of the Habsburger monarchy and enjoyed the special protection of the State of Clemens von Metternich, securing himself in his independent study of modern math and physics problems. In 1839 Ettingshausen was in Paris and participated with the publication of the Daguerreotype, and later lectured at the Académie of the Sciences of the Académie Beaux, which had arranged for François Arago on 19 August at Institut de France.

During his stay in Paris Ettingshausen was introduced personally to the new photographic procedure of Louis Jacques Mandé Daguerre and acquired a Giroux camera (No. 26). His own print series were taken after October 1839 on Johannisberg at Ruedesheim on the Rhine, the summer seat of the prince Metternich. Metternich, as well as the entire Austrian public, was completely informed about Ettingshausen. An exciting exhibition from Ettingshausen's daguerreotype at the Institut of the Viennese University took place on 22 November 1839. After this, a club of photographic pioneers in Vienna formed briefly, consisting of scientists, technicians, medical professionals, and artists, in which Ettingshausen also worked. Here he showed his first micro photographs and experiments with polarized light.

The result of Ettingshausen's photographic activity was limited to what he created during his membership in the 1861 photographic society in Vienna (since 1863, starting from 1875 as an honorary member) and to several photography courses, which he taught from 1863 to 1866 at physical Institut of the Viennese university. However, his contribution remained important to the fastidious scientific culture of photography in Austria during the nineteenth century.

Maren Gröning

Biography

Andreas von Ettingshausen was born on 25 November 1796 in Heidelberg (Germany). His parents first intended that he have a military career, but he had already taken studies at the school to Vienna in higher mathematics. In 1817 he reached Adjunkt (assistant) for mathematics and physics at the University of Vienna. In 1819 he became a physics teacher at the High School Innsbruck and in 1821 became professor of higher mathematics in Vienna. Together with Andreas Baumgartner he published the magazine for mathematics and physics in 1826–1832. In 1834 he took over the chair for physics at the University of Vienna (1852 institute leaders). Temporarily he taught also at the engineer academy at the same time (1848 to 1852) and at the polytechnic institute (1852) in Vienna. In 1845 he took part in a petition by intellectuals to loosen the censorship in the Habsburger state. In 1847 he was selected as the first Secretary-General (until 1850) of the founders' meeting of the Austrian sciences. From 1861 to 1862 he led the Viennese university as a rector. After his retirement in 1866 he was raised into baron status (knight of Ettingshausen). He died on 25 May 1878. As a practical photographer Ettingshausen might have been active only in the months of his participation in the publication of the Daguerreotypie in Paris in August 1839 up to his work in the circle of the Viennese " round court " in March and April 1840.

See also: Austro-Hungarian empire, excluding Hungary; Societies, groups, institution, and exhibitions in Austria; Daguerreotype; Microphotography; and Petzval, Josef Maximilian.

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VON GLOEDEN, BARON WILHELM (1856–1931)

Born Volkshagen Castle, Wismar, Germany, Baron von Gloeden contracted tuberculosis and moved to Taormina, Sicily c. 1879 and indulged a life of leisure until the family lost its fortunes at the instigation of Kaiser Wilhelm II. Forced to find money, von Gloeden turned his interest in photography into a business in 1888. Reputedly taught by his cousin, Wilhelm Plüschow (1852–1930) who had a studio in Naples from the 1870s, and Francesco Paolo Michetti, tourist prints soon gave way to collectors photographs of the male nude set in the landscape of antiquity, but created out of fin-de-siécle aestheticism. For a society still devoted to the Greek Ideal, he brought the myth to life, although his depictions were more Arcadian than Homeric. He achieved critical and financial fame and his photography entered the mainstream of European society. Using local peasant youths to create his ephebes, he opened savings accounts for his models and allocated royalties. Il Barone Fotografico was much loved in Sicily, until

von Gloeden, Baron Wilhelm. L'Offerta.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

Italian fascists, and then the War, destroyed many of his plates inspite of the attempts of his former model, go between, and heir, Pancrazio Bucini, to protect them. His influence was widespread: from his contemporaries Vicenzo Galdi, Gaetano D'Agata, Plüschow, to 1950s American Beefcake and David Jarmen's movie Sebastiane (1976). Post-Freud, post-1970s, and now regarded as the founder of male nude photography, Gloeden's homoerotic depictions have become part of contemporary gay culture.

ALISTAIR CRAWFORD

VON HERFORD, WILHELM (1814–1866)

Born in Soldin, Prussia (now Mysliborz, Poland), under the full name Friedrich Wilhelm Theodor von Herford, von Herford studied law in Berlin and Breslau and worked as a civil servant until 1846, at which time he began five years of travel and language study throughout Europe and the Middle East in preparation for a diplomatic career. While waiting for a post, von Herford traveled to Paris in 1853, where he sought out fellow Prussian Édouard Baldus for photographic instruction. Student and master traveled through Provence in September and October, working side-by-side as von Herford made his first successful pictures. Frustrated by the dull winter light of Paris, he moved to Rome before year's end, and the following fall received further instruction from an unidentified German photographer, likely Jakob August Lorent. From Rome, he traveled to Sicily in late 1854, to Sardis, Trabzon, and finally Beirut for the long-awaited consular position in 1855, photographing along the way, notably at Baalbek. He photographed extensively in Jerusalem in May and June 1856 and in Egypt in 1856 and 1857. In 1944 Erich Stenger reported the survival of 185 paper negatives (60 of Rome and elsewhere in Italy; 27 of Jerusalem; 44 of other sites in Palestine; 27 of Egypt; 5 of buildings in other countries; and 22 of portraits and costume studies) and 200 prints; what now remains is preserved at the Agfa Foto-Historama, Köln.

MALCOLM DANIEL

VON HUMBOLT, ALEXANDER (1769–1859)

Friedrich Heinrich Alexander, baron von Humboldt, brother to philosopher and linguist Wilhelm von Humboldt, was born in Berlin in 1769 and died there in 1859. One of the 19th century's scientific giants, often described as the last universal scholar, baron von Humboldt is considered one of the founders of geography. His extensive travels in South and Central America (1799–1804), recorded in a long series of publications, made him the century's most influential explorer. His final, monumental treatise *Kosmos* (1845–1862) aimed at a synthesis of knowledge on the natural and human world, and emphasized methods of observation. Von Humboldt's involvement with the beginnings of photography was brief but significant. Early in 1839, when he was in Paris, his long-time friend François Arago, the French scientist who sponsored Daguerre's and Niépce's invention, called upon the Prussian scientist to examine Daguerre's plates and testify before the French Academy. Von Humboldt was impressed. His letter of February 25, 1839 to fellow-polymath Carl-Gustav Carus, describing Daguerre's views of Paris, is one of the most eloquent of such early statements. His testimony in favor of Daguerre, and more generally his endorsement of photography's descriptive powers, influenced the adoption of the invention by explorers, especially in the United States.

FRANÇOIS BRUNET

VON KOBELL, FRANZ (1803–1882)

In January 1839, the first news of Daguerre's invention spread over Europe and the Academies took notice. Many professors attempted to recreate the experiement

to reproduce the same results. Carl August Steinheil, the Munich-based physicist and his colleague Franz von Kobell were amongst the academics who were interested in what Daguerre invented. It virtually took them only days to find a method of keeping light on paper; Steinheil constructed a small metal camera with a self-calculated lens and Kobell found a comparatively sensitive chlor-bromide process which produced negative images; these were reproduced for positive results. On Feb., 1, 1839, they published the first notice on their findings, and when Talbot released his own invention in March 1839, the two felt the obligation to surpass him by producing a number of actual images. Both presented their results—which were of photographs from Munich, reproductions of graphic arts, and images of smaller objects—to the Bavarian Academy of Science on July 3, 1839 with much acclaim. Their images were small, mostly 4 cm in diameter, but clear and sharp. Both did not think of their invention as more than a scientific experiment and did not develop their ideas further. While Steinheil stuck to photographic optics, Franz von Kobell left this field completely and concentrated on his two careers as mineralogist and as a playwright. His "Brandner Caspar" is still on the playlist of every Bavarian folk theatre.

Franz von Kobell was born on July 19, 1803 in Munich as the grandson of the painter and copper etcher Ferdinand von Kobell. He studied mineralogy in Landshut and started his professional career in the mineralogical state collection of Bavaria in 1823. In 1827 he was honoured as a member at the Bavarian Academy of Science. In 1834 he became professor of mineralogy at the Munich university, and in 1849 he was made director of the named state collection. His main concerns were of practical questions of crystallography and anorganic chemistry. Besides his cooperation with Carl August Steinheil in the invention of photography he is named for a "stauroscope" which he patented in 1855. From 1839 on, Franz von Kobell published numerous books as an author in both Bavarian and Palatinate dialect as well as in the standard language. Prior to his death on Nov.11, 1882, in Munich he was honoured with knighthood. In 1896 there was a memorial dedicated to him. His daughter Luise, then a well-known author, wrote a comprehensive biography on him and his life's work.

ROLF SACHSSE

VON LENBACH, FRANZ (1836–1904)

Franz Lenbach was born on Dec. 13, 1836 in the village of Schrobenhausen in Bavaria. Following short studies at the Augsburg polytechnic school he became a student of Karl von Piloty in 1857 for a short time, taught painting at Weimar in 1860, and began travelling to Italy and France for several years. From 1868 he devoted himself exclusively to portraiture. Within a short time, Lenbach had introduced photography as an aid to his work. There were a number of photographers working for him, most notably Karl Hahn. Lenbach gained enormous fame for his portraits of Otto von Bismarck for which he had more than 120 photographs made of the German chancellor; the result were more than 80 paintings. The use of photography in Lenbach's painting processes was threefold: first he had the heads of the photographs enlarged to copy them. Second he had slides made from the images which were then projected onto the canvas. And third, he used the Parisien method of "photo-peinture", a sensitively covered canvas with a faint images of the portraited over which he painted his picture. He believed in photography as an aid in the quick delivery of painting commissions. Only within the last two years of his life did he take photographs himself. He died in Munich on May 6, 1904.

ROLF SACHSSE

VON STEINHEIL, CARL AUGUST (1801–1870) AND HUGO ADOLF (1832–1893)

Astronomers and lens and camera manufacturers

Born in Rappoltsweiler, Alsace, Carl August Steinheil studied science and astronomy, obtaining a doctorate from Konigsberg University in 1825. In 1832 he became professor of mathematics and physics at Munich. In March 1839, after William Henry Fox Talbot had sent a copy of his paper, 'Some account of the art of Photogenic Drawing,' to the Bavarian Royal Academy of Sciences, Steinheil, together with a colleague, Franz von Kobell, conducted their own experiments in photography. Steineil designed a cylindrical camera, made from cardboard and resembling a telescope which produced circular negatives on paper sensitised with silver chloride solution. He later went on to make the first daguerreotypes in Germany.

Steinheil's son, Hugo Adolph, studied optics and astronomy in Munich and Augsburg. In 1854, father and son founded the Steinheil Optical Institute in Munich. Adolph designed a number of innovative lenses, including the Periskop in 1865 and the Aplanat the following year. In 1866 he bought out his father's interest in the Institute, which then became C. A. Steinheil Sohne, and he carried on the work of the Institute following his father's death in 1870. He continued to design lenses, writing an influential book on lens design in 1891, two years before his death.

COLIN HARDING

VON STILLFRIED-RATENICZ, BARON RAIMUND (1839–1911)

Austrian photographer, painter, soldier, diplomat, and restorer.

An adventurous aristocrat, Stillfried was one of the most important travel photographers of the Austro-Hungarian Empire. He was born at Komotau in Bohemia, Austria (now Chumotov, Czech Republic) on 6 August 1839, second of three sons of Baron August von Stillfried-Ratenicz, a decorated career soldier, and Countess Anna, née Clam-Martinicz. After spending most of his early childhood in the Austrian Military Frontier district (now Croatia), he began a formal education in 1851 at the prestigious Marine-Akademie in Trieste. During his five-year residence in the port, Stillfried received painting lessons from the accomplished Orientalist Bernhard Fiedler (1816–1904), who recognised his talent and attempted without success to convince his father to support the boy's artistic pursuits. After gaining a cadetship to the army's second Engineering Battalion, he moved to Linz in 1856 and attended the drawing classes of Joseph Maria Kaiser (1824–1893). Although rapidly promoted through the army ranks, he soon abandoned his military career "in order to satisfy his thirst for adventure and travel" [um seinen Durst nach Abenteuern und Reisen zu befriedigen] (A. Th.).

In January 1863, against his father's wishes, he voluntarily resigned from the Imperial army and travelled as a shipsboy to Callao, Peru. Financing his wanderlust through several odd trades, he eventually reached Nagasaki, probably in late 1863, where he worked for the Dutch silk firm Textor & Company, acquired some Japanese language skills, and met the Prussian landscape painter Eduard Hildebrandt (1818–1869). Although Stillfried later claimed to be self-taught, Fiedler, Hildebrandt, and to a lesser degree Kaiser, all built successful careers on the depiction of distant lands for the European market and their example perhaps inspired the young traveller towards a similar artistic vocation.

In mid-1865, Stillfried left Japan to join the volunteer forces of Emperor Maximilian of Mexico. A decorated officer, he remained in Mexico after the French withdrawal, serving in the beleaguered forces until the execution of Emperor Maximilian on 19 June 1867. After briefly returning to Austria, he travelled again to Japan and by July 1868 settled in Yokohama where he resided until 1881 (although he frequently travelled overseas). During the first two years, Stillfried worked for the North German Legation in Tokyo and sent regular reports on local affairs to the Austro-Hungarian Foreign Ministry. He also assisted the Austro-Hungarian diplomatic mission on their arrival at Yokohama in October 1869 (Wilhelm Burger acting as official photographer), for which he received the Franz Joseph Order on 15 March 1871. Aware of the booming local photographic market, Stillfried quit his diplomatic position in 1870 and opened a photographic supply shop in Tokyo. He obtained lessons in wet-plate photography from the experienced professional Felice Beato, before finally opening his own studio of Stillfried & Company at No. 61, Yokohama. Announcing the establishment of the new atelier, *The Hiogo News* noted on 9 August 1871: "A new photographer has started in Yokohama, Baron Stillfried was once a pupil of Mr. Beato and is now trying to undersell him." (Harold S. Williams Manuscript Collection, National Library of Australia, Canberra) As Beato's active interest in photography waned, Stillfried came to dominate the local market, catering for the influx of foreign tourists attracted to Japan during the 1870s. His work was widely reproduced in the overseas illustrated press and exhibited at several world exhibitions, including Vienna (1873), Philadelphia (1876), Paris (1878), Melbourne (1880) and Calcutta (1883). Although best known for his hand-tinted 'costumes' of generic Japanese 'types,' his first portfolio revealed a predilection for the landscape that brought a trained classical aesthetic to the Japanese views of Beato and Burger. A vastly underrated outdoor photographer, he further demonstrated his landscape capabilities in the later Hong Kong (1881–1882), Siam (1882–1883) and Balkan collections (1889).

Throughout his career, Stillfried's entrepreneurial ambition often led to scandal. In January 1872, he prompted a serious diplomatic affair after attempting to market an unofficial portrait of the Mikado taken during the emperor's inaugural public appearance at Yokosuka arsenal. The following year, he again courted controversy after transporting a seven-room teahouse to Vienna for the World Exhibition, accompanied by three Japanese women hired to serve tea to the prospective guests. The authorities refused to allow the building's reconstruction in the official grounds after reports associated the enterprise with Japanese prostitution. Despite losing a substantial amount in the venture and returning to Japan near bankruptcy, Stillfried quickly rebuilt his enterprise, now situated at No. 59, Yokohama, and soon promoted as the Japan Photographic Association. In November 1874 Josef Lehnert, a member of the Austrian expedition sent to Japan to record the Venus transit, pronounced in his travelogue: "As a photographer Baron von Stillfried achieves extraordinary things, really his atelier is the best and most important in the whole of East Asia." [Als Photograph leistet Freiherr von Stillfried Außerordentliches, thatsächlich ist sein Atelier das beste und bedeutendste in ganz Ostasien.] (Lehnert, Band II, 532) For his assistance photographing the astronomical event, Stillfried gained the title of court photographer on 25 April 1875 to the Austro-Hungarian Empire.

In 1875, Stillfried formed a partnership with a Prus-

sian accountant, Hermann Andersen, which allowed him to concentrate on his profession and leave the business operations to his associate. He travelled to Shanghai for a month in April 1876, returning to Yokohama with a large collection of Chinese genre images. Stillfried's products of the mid-1870s, most notably the albums generically entitled Views and Costumes of Japan were beautifully presented objects containing an equal number of hand-tinted studio 'types' and untinted 'views' (State Library of Victoria, Melbourne, Australia). Under his direction, the art of hand-tinting reached new standards rarely approached by subsequent studios, as he established select colours for each print chosen to highlight particular items of ethnographic interest. At its height, Stillfried claimed his studio employed thirty-eight full time Japanese workers, testifying to the firm's astounding popularity.

However, several business setbacks soon curtailed Stillfried's high standard Japanese work. On 14 January 1877, fire destroyed his studio and whilst most of his negatives were saved, at least some were probably destroyed. A week later Stillfried purchased Beato's entire stock, negatives and studio on the Yokohama waterfront, before departing on 6 June 1877 for a one-year international tour. He exhibited to considerable press attention at the annual salon of the Photographic Society of Great Britain in November 1877, before visiting several European cities, including Amsterdam, Berlin, Vienna, and Paris. In June 1878, he finally returned to Yokohama and promptly sold his share in Stillfried & Andersen to his business partner. In an extraordinary clause to the contract of dissolution, Stillfried agreed not to establish any future studio in Japan for a ten-year period. Andersen, however, continued to market albums under the Stillfried & Andersen banner containing an assortment of Beato and Stillfried reprints, as well as his own studio products, until 1883.

After a six-month Japanese government position teaching photography at the Department of State Printing, Stillfried opened a studio at his Tokyo residence in May 1879, but was forced out of business after Andersen issued a successful legal challenge for breach of contract. In response to the court decision, Stillfried invited his brother Franz to Yokohama, who shortly after his arrival on 25 October 1879 established the photographic studio of Baron Stillfried's Studio, No. 80. On 6 December 1879, Stillfried sold his remaining stock and photographic materials to Franz, prompting an acrimonious series of lawsuits between Andersen and the Stillfried brothers. Although Stillfried assisted his brother Franz in the studio's operations, his position was untenable and he soon left for continental Asia in search of new opportunities.

From September to December 1880, Stillfried operated a portrait studio in Vladivostock and produced a portfolio of Siberian studies, reputedly soon afterwards destroyed by fire. He returned to Yokohama for several months, before departing permanently on 4 May 1881, possibly once again for Siberia. He eventually arrived in Hong Kong on 15 October 1881, where he once again opened a portrait studio and gained a lucrative commission from the Governor-General, Sir John Pope-Hennessy, to document the decorations installed around the colony in preparation for the royal visit of Princes' Albert Victor and George of Wales. On 28 February 1882, Stillfried embarked for Siam (now Thailand) and remained thirteen months under the auspices of King Chulalongkorn, employed on several photographic commissions and the restoration of the royal oil painting collection until his permanent departure for Europe in April 1883.

von Stillfried und Ratenitz, Baron Raimund. Actor in Samurai Armor.
The Metropolitan Museum of Art, Gilman Collection, Museum Purchase, 2005 [2005.100.505 (2b)] Image © The Metropolitan Museum of Art.

Although at first little known in Vienna, Stillfried quickly established his reputation with an exhibition in February 1884 at the Österreichische Museum für Kunst und Industrie of around four hundred photographs, paintings, and sketches of Japan, China, and Siam. Perhaps due to Emperor Franz Joseph's personal attendance, Stillfried received exclusive permission the following year to visit twelve Habsburg estates, resulting in an important series of interior room photographs and

paintings exhibited in February 1886 at Vienna's Österreichischer Kunstverein. In 1889, Stillfried travelled through Bosnia-Herzegovina, Dalmatia and Greece producing a collection of three hundred landscape, ethnographic, and archaeological studies, again exhibited in Vienna the following year. These exhibitions culminated in a large retrospective at Trieste in May 1891 comprising one thousand Asian and European images from the previous twenty years of work.

In the early 1890s, Stillfried established a large studio for the restoration of oil paintings at Feldsberg bei Lundenberg (now Czech Republic). He exhibited paintings regularly at several art societies, which some critics compared to the celebrated work of Rudolf von Alt. Although the Viennese city directory Lehmanns Adreßbuch continued to list Stillfried as an active photographer until his death, by the early twentieth century he was primarily occupied as a painter of architectural interior scenes until illness hindered further activities in 1908. He died from a heart attack on 12 August 1911 at his apartment in Gentzgasse 9, Vienna.

LUKE GARTLAN

Biography

Baron Raimund von Stillfried-Ratenicz was born into an aristocratic family on 6 August 1839 at Komotau, Bohemia, in the Austrian Empire (now Chumotov, Czech Republic). From his early childhood, he developed a penchant for maritime travel, art and distant cultures, nurtured in the thriving cosmopolitan port of Trieste. In broad terms, Stillfried's adult career can be divided into two periods. The first comprises the twenty years of travel between his resignation from the Austrian army in 1863 and his final return to Vienna. Eventually settling in Yokohama after five years spent in South America, Japan and Mexico, he established a photographic studio by August 1871, which soon gained international recognition for the hand-tinted genre scenes and untinted landscapes. He left the Japan Photographic Association in June 1878, and was later active in Siberia, Hong Kong and Siam. In the second period, from 1883 following his return to Vienna until his death in 1911, Stillfried continued to remain active, assembling important photographic portfolios of the Habsburg estates, the Balkan and Greek peninsulas, and numerous other European sites. His personal life, with separate families in Japan and Vienna, reflects these two phases in his career. A common aspect of treaty port life in Asia, Stillfried had a long-term liaison with a Japanese woman named Nishiyama Haru, with whom he had three daughters christened Mary, Anna, and Helen. After returning to Vienna, Stillfried married Helene Jankovich de Jeszenicze on 22 September 1884, with whom he had a further two children, Alice and Alfons. He died in Vienna on 12 August 1911, a few days after his seventy-second birthday.

See also: Burger, Wilhelm Joseph; and Beato, Antonio.

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VON VOIGTLÄNDER, BARON PETER WILHELM FRIEDRICH (1812–1878)

Viennese inventor and lens maker

Peter Wilhelm Friedrich von Voigtländer was born into a family of optical instrument makers in Vienna in 1812. His grandfather, Johann Christoph von Voigtländer (1732–1797) had established a small business in the Austrian capital in 1756 manufacturing microscopes, compasses and other optical instruments. Johann had three sons, the youngest of whom, Johann Friedrich (1779–1859), carried on the family business after his father's death in 1797. As a young man, Johann travelled to England to study optics and, after his return to Vienna, started to make lenses in about 1808. In 1823 Johann invented and patented the opera glass. In 1837, aged 58, Johann Friedrich retired and the management of the family business was taken over by his son, Peter Wilhelm Friedrich, then just 25 years old.

By this time the house of von Voigtländer had already gained a reputation of being one of the very finest European optical instrument makers. Peter, although still comparatively young, had a wealth of knowledge and experience. His early education and practical instruction came from his father. For his more advanced and theoretical education he later enrolled at the Vienna

Polytechnic Institute. Peter's practical experience and knowledge was broadened by travelling and working in Germany, France and England.

His primary area of interest was optical theory, including calculating the refraction and diffusion characteristics of various types of glass. It was inevitable, therefore that he soon befriended and began to collaborate with the mathematician Josef Max Petzval (1807–1891) who in 1837, the same year that Peter took over from his father, had become professor of higher mathematics at the University of Vienna. In 1840, Petzval, who had not designed a lens before, mathematically calculated the optimum arrangement for a lens intended specifically for photography. Up to this time, camera objectives were simple lenses that had been designed for other uses. The slowness of these lenses exacerbated the lack of sensitivity of the earliest photographic processes. Petzval entrusted the construction of his, at the time still theoretical, lens to his friend von Voigtländer. The first sample Petzval lens was completed in May 1840. It was made up of two separate asymmetrical lens components, a front lens with a forward-facing convex surface and a rear component consisting of one planoconcave and one biconvex lens, separated by a space. Definition and illumination was excellent in the centre of the field but deteriorated gradually towards the edge of the picture. However, this was not seen as a problem for portrait photography and could even be regarded as beneficial since it tended to emphasis the actual portrait area and suppress unwanted background detail. Petzval's design became the standard lens for portraiture until well into the twentieth century.

The original Petzval Portrait lens had an aperture of f/3.6. This made it sixteen times faster than the simple meniscus lenses that were currently in use and reduced exposure times from minutes to seconds. In 1841, von Voigtländer fitted a Petzval lens into an all-metal daguerreotype camera that he designed and manufactured. Of distinctive and unusual design, von Voigtländer's camera consisted of a conical brass body with the lens at its apex. A shorter conical focussing attachment with a ground glass screen and a magnifying eyepiece could be screwed into the other end. The camera rested on a cradle on top of a telescopic pillar. After focussing, the camera was removed from the stand and carried to a darkroom where the focussing attachment was removed and replaced by a plate-holder containing a sensitised circular daguerreotype plate, 94mm in diameter. The camera was repositioned on its stand and the exposure made by removing and replacing the lens cap. It is estimated that von Voigtländer produced about 70 of these cameras in 1841 and around 600 the following year. Today, however, only about a dozen are still known to exist.

Despite their initial friendship and shared interests, von Voigtländer and Petzval soon quarrelled, primarily because Petzval felt he had not received sufficient financial reward for his invention. By the end of the 1840s the two men had ceased to be on speaking terms. Petzval had taken out an Austrian patent for his lens but in 1849 von Voigtländer established a second factory in Braunschweig, Germany, which was his wife's hometown. Here, there were no legal restrictions and von Voigtländer continued to produce Petzval lenses in increasing numbers. In 1862 he produced his ten thousandth lens. In 1866 von Voigtländer closed his original factory in Vienna. That same year he was made a member of the hereditary peerage by Emperor Franz Joseph of Austria, which entitled him to use the prefix 'von' before his name.

Peter Wilhelm Friedrich von Voigtländer retired in 1876 at the age of 64, handing over the business to his son, Friedrich Ritter von Voigtländer (1846–1924), the last of four generations of von Voigtländers connected with the optical industry. Friedrich, a fine lens designer in his own right, ensured the continuing success of the company with the introduction of the Euryscope lens in 1886 and the Collinear lens in 1892. Around the turn of the century, von Voigtländer branched out into camera manufacture which was subsequently to become a major part of the company's business.

Colin Harding

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VUILLARD, ÉDOUARD (1868–1940)

French painter and lithographer

Édouard Vuillard, known primarily as a painter and lithographer, produced over 2000 photographs (1700 as original prints) during his lifetime. Vuillard began experimenting with a hand-held Kodak camera in the late 1880's along with fellow artists Pierre Bonnard and Maurice Denis. These photographs taken throughout his lifetime focused primarily on the artist's circle of family and friends, as was the case with his paintings. He used the camera as a witness, spontaneously asking those around him to "hold it please" when he wanted to record a casual everyday moment, as mentioned in "Vuillard et son Kodak."

Vuillard also utilized photography to experiment with spatial ambiguity often staging scenes he later recreated in his paintings. The artist composed many

scenes to place the women in his life on center stage. Either through foreground placement or by putting them in focus, numerous photos exist of the two infatuations of Vuillard's life: Misia Natanson and Lucy Hessel. The artist's mother, however, was the subject he shot most; it was also she, often more than the artist himself, who frequently developed his photographic works.

Vuillard did not exhibit his photographs during his lifetime. They have predominately been hidden from public view in family archives until over 80 were revealed in the international 2003 Vuillard exhibition. A catalogue raisonné of all photographs in the family archives is forthcoming.

DEBBIE GIBNEY

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W

WALKER, SAMUEL LEON (1802–1874)

Samuel L Walker was one of the earliest daguerreotype photographers in the United States and was widely regarded as one of the best photographers during the 1840s and 1850s. He lived and worked in Poughkeepsie, New York.

Walker was born in 1802 at New Salem, Massachusetts, and enjoyed careers as a daguerreotypist and photographer, writer and spiritualist. There is some evidence to suggest Walker was an assistant to Samuel F. B. Morse in New York; he then had a studio in Albany before moving to Poughkeepsie by 1847. He seems to have stopped photographing between 1854 and the early 1860s when wet collodion photography began to supersede the daguerreotype and poor health limited his activities. By May 1864 Walker had returned to photography and was practicing the collodion process in his Photographic Institute.

The only known collection of Walker's work is held by George Eastman House in Rochester, New York, and the twenty daguerreotypes there consist of portraits including studies of his own children which Sobieszek claims are 'some of the most exciting images created by the daguerrean artist.' His daguerreotypes of his daughters are reminiscent of the work of Lewis Carroll in their directness and latent sexuality.

He died on 25 April 1874 aged 72 years when he was described as a man of great artistic taste with a love for his profession.

MICHAEL PRITCHARD

WALKER, WILLIAM HALL (1846–1917)

William H. Walker began making a wooden pocket amateur camera in Rochester from 1880 and by 1883 he was successfully manufacturing dry plates. He gave up camera making, allowing his former partners to form the Rochester Optical Company which continued with the camera making side of the business.

George Eastman recognising Walker's skills as a chemist and experience with plate manufacturing offered him a job which he accepted from the beginning of 1884. He began work on developing what became the Eastman-Walker roll film holder which allowed a roll of film to be used with any plate camera. The roll holder was patented in Britain on 25 November 1884 and in the United States on 5 May 1885. Through its use of standardized parts it could be mass-produced and was made in Frank Brownell's works, being placed on the market in 1885. It was produced in eleven different sizes. The roll holder proved popular with the photographic press and with amateur photographers so that by 1888 35 percent of negatives at the London Camera Club's summer outings were made using it. Rival companies introduced their designs.

Walker, with Eastman, also designed a paper and film coating machine and this, with the roll-holder and the development of a film, was intended to give Eastman's company a complete system of film photography.

In 1884 Walker became Secretary to the Eastman Dry Plate and Film Company and in 1885 he was sent to London to supervise the company's European activities, leading to the establishment of the Eastman Photographic Materials Company Ltd which was incorporated in November 1889.

Walker's relationship with Eastman, which had always been testy, deteriorated and Eastman himself was forced to find a factory site rather than rely on Walker. The Harrow site was purchased, the first for the company outside of Rochester. Walker was not a businessman and Eastman found Walker's negative attitude and repeated threats to retire tiresome. He finally accepted such a threat and George Dickman was appointed to take over

from Walker from January 1893. Eastman soon forced Walker from the company completely.

Walker, a wealthy man from his Kodak stock, died in November 1917.

MICHAEL PRITCHARD

WALL, ALFRED HENRY (d. 1906)

According to his obituary, Alfred Henry Wall was born in London, date unknown, and had a childhood sufficiently unhappy that he ran away from home and went to work for a time for one of the earliest daguerreotype studios in the city before joining a theatre company—an activity he would return to for a period in the 1860s.

He opened his own studio in Cheapside c.1850, and another in the Strand (date unknown), but by 1851 was working as a photographic assistant at the Great Exhibition.

Photographic News reported in 1861 that he was working as an itinerant portrait painter under the name of R. A. Seymour, and coincidentally in that year he published *A Manual of Artistic Colouring as Applied to Photographs.* By 1862 he had returned to commercial photography and opened a studio in London's Westbourne Grove.

In 1864 and 1865 he published two annual volumes entitled *The Art Student* which discussed photography as an art form, a subject aired several times since 1859. From 1868 until 1870 he edited *The Illustrated Photographer*, which described itself as 'a weekly journal of science and art,' and his contributions to several contemporary journals did much to expand understanding of the photographic processes.

Wall's last photographic book *Artistic Landscape Photography* was published in 1896.

JOHN HANNAVY

WALL, EDWARD JOHN (1860–1928)

Edward John Wall was one of the leading writers on the theory and practice of photography in the closing decades of the nineteenth century. His 1889 *Dictionary of Photography* became a standard reference work and ran to many editions worldwide. Although not published until 1925, his *History of Three-Colour Photography* was the first reflective look at that subject, drawing on material he had first published in the *British Journal of Photography* in the early 1900s.

In the closing years of the 19th century he contributed a manual on carbon printing to *Amateur Photographer* magazine's *One Shilling Library* series of books, but one of his most significant contributions to the practice of photography was his published 1907 suggestion for the technique which became known as bromoil printing. Wall himself did not fully articulate the mechanics of the process, but his initial suggestions as to how it might work were realised in a practical sense by C Welbourne Piper, who published a working process later that same year.

Trained as a chemist, Wall initially worked for the plate manufacturers B. J. Edwards & Co. in London, before embarking on a career which embraced camera manufacture in the United States with the Blair Camera Company, journalism, photography, and motion pictures.

JOHN HANNAVY

WALTER, CHARLES (CARL) (c. 1831–1907)

Botanist, photographer, journalist

Born in Germany, he emigrated from Mecklenberg, Tokheim, to Victoria, Australia, in c.1856 where he worked as a botanical collector for the Victorian Government Botanist, Baron von Mueller. In 1858, he worled as a photographer and botanical collector, accompanied R.L.J. Ellery's geodetic survey party into eastern Gippsland.

In 1865, he advertised himself as a "Country Photographic Artist" of 45, Bell Street, Fitzroy, Melbourne, and began supplying photographs and reports of his travels in the bush to *The Illustrated Australian News.* Much of his early work was concerned with recording portraits of aborigines and he documented the mission stations of Ramahyuck (Lake Wellington), Coranderrk (Yarra Flats) and Lake Tyers. In 1867, he sent portraits of *Natives of Victoria* to the Anthropological Society of London.

Walter was, perhaps, Australia's first photojournalist, for as early as 1865 he sent a report of the "Salmon Tanks in Badger Creek" to the *Illustrated Australian News*. In the following year, he describes a trip overland to "Falls on the Niagara Creek, Mount Torbreck" with his "apparatus and tent upon his back—the whole weighing about fifty pounds."

Walter used a stereoscopic camera for most of his work but also produced some half-plate and whole-plate negatives. He registered photographs with the Victorian Copyright Office in 1870 and in 1871 he advertised "A very large stock of Stereoscopic Views of Aboriginal Life, Mining, Scenery and other Australian Subjects." The earliest extant photograph by Walter is dated 1862; his work continued to be published until the early 1870s.

BILL GASKINS

WAR PHOTOGRAPHY

Introduction

The medium of photography was generally accepted as a reflection of reality in the nineteenth-century. In truth, many photographic war scenes were manipulatively staged. At times this was because the artist wanted to reflect what they had seen with their own eyes, but were unable to capture with the camera. The creation of photographs was also incredibly arduous on the battlefield. Lighting had to be ideal, photographic equipment was cumbersome, and plates had to be processed quickly necessitating portable darkrooms. In addition, the slow development of the medium itself made it impossible to produce action photographs.

Even with the assumed veracity of photographic works, photographs were seldom printed in newspapers in the nineteenth-century. More likely they were seen when displayed in galleries, sold in books, or copied by engravers for newspapers. However, often engravers invented scenes of battle that had not been captured by photographers. The development of half-tone printing, which enabled the combining of text with photographs, fueled a rise of photos in papers during the Spanish-American War and Second Boer War at the end of the century.

Early War Photography

The earliest photographs of wartime events come from the end of the Mexican-American War (1836–1848). These images are not of battle scenes, but rather posed scenes of soldiers. "General Wool and Staff, Calle Real, Saltillo, Mexico," c. 1840, offers a good example of the kind of choreographed scene frequently produced. Wool's regiment paused for several minutes to accommodate the exposure time needed for the daguerreotype; one can see that the figures on the left are slightly blurred from having moved. The difficulties of obtaining photographic materials, the lengthy preparation time necessary, and the long exposure period for the daguerreotype, made photography rare in this period. Only around fifty photographs survive, and we have no record of specific photographers of the Mexican-American War images.

The first identifiable photographer who took pictures in a wartime environment was John McCosh. McCosh served as a British surgeon during the Second Sikh War (1848–1849) in India and the Second Burma War (1852). Using the calotype, McCosh photographed fellow soldiers, artillery, and ruins. Karl Baptist von Szatmari also exhibited some photographs of a battle between the Russian Army and the Turks in the Paris Exhibition of 1855; an engraving after one of these scenes survives, as do some of the photographs themselves.

1850s

Richard Nicklin had been hired by the British military to photograph government-sanctioned scenes of the Crimean War (1853–1856), but the photographer and his two assistants were caught in a hurricane and drowned

Wood and Gibson. Inspection of Troops at Cumberlanding, Pamunkey, Virginia.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

in Balaclava Harbor in November of 1854. Photographs from other artists such as Gilbert Elliot, and two military officers, ensigns Brandon and Dawson, were also hired by the government to cover the war, but all of their works have since disappeared.

Roger Fenton produced over 350 images of the Crimean War during 1855. Thomas Agnew hired Fenton with aspirations of creating a profitable issue of photos similar to those that the military photographers had been hired to photograph but never produced. Roger Fenton wrote in letters of some of the horrors he witnessed during his time in the Crimean, but his photographs do not reflect the scenes he describes. Rather, Fenton mostly photographed heroic portraits of soldiers, positive scenes of life in the camps, and images of the surrounding landscape. Fenton may have felt compelled by Agnew, as well as Queen Victoria with whom the photographer had developed a warm relationship, to photograph encouraging images of the war to try and offset the negative impressions given to the British people by newspaper reporter William Howard Russell. Fenton was also limited by photographic materials of the time which did not yet enable spontaneous action shots. He was also challenged by the collodion wet plate process technique which required speed and virtuosity as he only had short time to develop the plates in his makeshift traveling laboratory after taking a scene.

Fenton's most recognized war image is one of the few in which he allowed a sense of sadness at the destruction of war to creep into his work. Arriving shortly after the brutal attack of soldiers of the British Light Brigade by the Russians on October 25, 1854, Fenton's "Valley of the Shadow of Death" showed the infamous valley as a desolate landscape filled with cannon balls. The exhibition of the photograph in 1855, and the popularity of Lord Tennyson's "Charge of the Light Brigade," written in 1864, marked this event in the memory of the British people.

James Robertson, Felice Beato, Charles Langlois, and Karl Baptist von Szatmari all photographed the final stages of the Crimean War. Of these, the sixty or so photographs taken by Robertson have become the most well known. Robertson's works showed more scenes of death, destruction, and violence, the kind of subject matter not in the work of Fenton. Although Thomas Agnew & Sons published both Fenton's and Robertson's Crimean photographs in 1856, Robertson does not seem restricted by Agnew to shoot only government-favored photos as Fenton had been, perhaps because of Robertson's other sources of income. In the end, Agnew's commercial adventure was not as successful as he had hoped. Fenton's and Robertson's photographs went on sale, both individually and as sets, as early as November 1855. However, the public had little interest in these images by the end of the war. By the end of 1856, Thomas Agnew & Sons sold all remaining prints and negatives from both photographers at auctions.

After photographing the end of the Crimean War, Felice Beato and James Robertson worked together in Calcutta and photographed the Indian Mutiny, of First War of Independence, of 1857. Beato's most striking images from this period are scenes of the execution of over 2000 Indian rebels by the British, and those of Secundra Bagh in which he recorded the devastation in the months that followed. In his photographs from the 1850s, Beato is often credited as the first to photograph corpses after a battle. Beato probably choreographed many of these scenes to heighten the dramatic effect, perhaps even excavating and arranging corpses. Beato became the most prolific photographer of war scenes of the Asian world in the nineteenth century including the recording of the Opium War in China (1860) and the Japanese attacks in the Simonaki Straights in September of 1864. Also during this decade, several photographers were sent to the battlefields during the War of the Triple Alliance in South America (1864–1870), in hopes for commercial success. Bate & Co. published Esteban García's work from this period in sets of ten titled La Guerra Ilustrada. However, it was the American Civil War (1861–1865) that was the first war to be extensively photographed.

1860s/American Civil War

It was the publishers' awareness of the public's desire for war scenes that caused the prolific photographic work produced during The American Civil War; at least five hindred photographers accompanied the soldiers of the North. Photographs were then made into engravings to be published in the papers, or sold to E. and H. T. Anthony and Co., who at times issued more than a thousand pictures a day. The photographs themselves would not be viewed by the public until they were displayed in galleries.

George S. Cook took images right after the fall of Fort Sumter, marking the beginning of the war between North and South. While Cook became one of the few photographers to shoot Confederate subjects, one of his most famous works is of a Federal troop leader, Major Robert Anderson who had been defeated at Fort Sumter. After the war, Cook collected over 10,000 photographs from the war; these are now in the collection of the Valentine Museum in Richmond, Virginia.

However, Matthew B. Brady is the name most synonymous with Civil War photography. He determined that he could make a profit organizing photographers to shoot the war and closed most of his galleries which had been highly successful portrait studios for the rich and famous. He had even done several sittings with President Lincoln who credited Brady with helping him win the

election with these fine portraits of the President. Brady claimed he was called to the war, "I felt I had to go. A spirit in my feet said 'go,' and I went."

Although suffering from poor eyesight, Brady initially went to the fields and was greeted with distaste from many of the soldiers who suspiciously saw his camera as some kind of weapon. Later, he organized other photographers to do most of the actual photographing. However, Brady managed to frequently place himself within photographs of military heroes. Throughout the course of the war, Brady hired over twenty photographers to shoot the troops, battle scenes, and the bodies after the massacres. He organized a complex system of equipping each of the photographers with a portable dark room and stocked chemicals and glass plates at the major battlefields. His team of photographers produced over 7000 negatives during the war.

One of Brady's best photographers was Alexander Gardner. Gardner followed the Army of the Potomac and captured most of their battles. His first war photographs were exhibited in Brady's studio in September of 1862 and captured the horrific results of the Battle of Antietam, the bloodiest battle of the war in which 26,000 soldiers were killed or wounded. The gallery received huge crowds desperate to see these first images portraying with veracity the costs of war. These photographs were dramatically realistic in contrast to heroic scenes that had been done of dead soldiers by painters in this period. Gardner showed the actual decay of the corpses and the inhumanity of their deaths. Eight of these photographs were also published in *Harper's Weekly* on October 18, 1862.

The *New York Times* praised the show, "Mr. Brady has done something to bring home to us the terrible reality and earnestness of war" and Gardner was disturbed by Brady's assumed ownership of these photographs. Each photograph was boldly marked with "Brady's Album Gallery" in contrast to Gardner's name written in small barely noticeable print. Gardner reacted by taking the negatives of his photographs along with Timothy O'Sullivan and James F. Gibson, some of Brady's best photographers, and opened his own studio. Once working for himself, some of Gardner's most intriguing works were those from his series on the execution of the conspirators who plotted the murder of President Lincoln.

Gardner clearly credited the photographers who worked for him in the publication of their work. For example, Timothy O'Sullivan, while working for Gardner, produced arguably the most famous war photograph, the "Harvest of Death" taken of the battlefield of Gettysburg. This scene shows a field covered with bodies, highlighting the numerous deaths from this battle. Yet O'Sullivan simultaneously shows the viewer one soldier's face, his contorted hand in the center of the photo, bringing a large inconceivable number down to the reality of many individuals. Other soldiers have their clothes partly removed as thieves have already been searching their bodies. The scene achieves the kind of accurate reportage which Gardner supported when he remarked that this photograph by O'Sullivan "conveys a useful moral: it shows the blank horror and reality of war, in opposition to the pageantry."

Photography also filled a unique role for families who sent their loved ones to battle. Portraits of soldiers were often taken before leaving for the war and makeshift studios were set up in many battlefields enabling soldiers to send home images of themselves. The recently developed and inexpensive tintype photographs were particularly popular. It should be highlighted that although a few photographs of African-American troops and the treatment of slaves were taken, the photographic record of this period for African-Americans is minimal in comparison to the copious photographs taken of the war.

Some of the many photographers not discussed in depth in this essay who photographed scenes from The Civil War include: George Barnard, Bergstresser Brothers, Sam Cooley, James Gardner, James Gibson, S.A. Holmes, David Knox, Theodore Lilienthal, Royan Linn, A.D. Lytle, William Pywell, James Reekie, George Rockwood, T.C. Roche, John Scholten, William Morris Smith, Julian Vannerson, David Woodbury, and J. A. Young. Andrew J. Russell is the only photographer during the Civil War to have been paid by the government.

After the war, photographs of the battlefields were difficult to sell as the public preferred to forget their tragic losses. Alexander Gardner's Photographic Sketch Book of the Civil War published after the Civil War, which included O'Sullivan's famous Harvest of Death, had little response. While many photographers struggled, perhaps none suffered more than Brady who had bankrupted himself from his investments to photograph the war and ended up destitute and mostly blind. Also after the end of the war, Frank Leslie's *Illustrated Newspaper* published images of Southern war camps and malnourished prisoners. Mary Warner Marien discusses the role of the North's blockade of the South as a cause for the extreme neglect of the prisoners of the Confederacy.

The 1870s and 1880s

During the 1870s and 1880s numerous regional wars took place throughout the globe. However, few photographers recorded these events, as there was little interest in them for purposes of print illustrations. Rather, most newspapers hired artists to sketch dramatic battle scenes believing photography lacked the ability to capture the

action. Louis Heller shot images of prisoners which were used, however, for the cover of Frank Leslie's *Illustrated Newspaper*, July 12, 1873. Eadweard Muybridge produced some dramatic images of the battle between the Modac Indians and the American Cavalry on the border of Oregon and California in 1872–1873. Muybridge frames individual proud Native Americans as they fight to keep their land; in truth, most of the tribe would be hung when this battle was lost. Bismark's war against Schleswig-Holstein was photographed by a handful of artists showing mostly views of the destruction of the landscape and corpses. Only negligible photos survive from the Russo-Turkish War (1877–1888).

While James Burke photographed many struggles in Afghanistan, the best are of the Second Afghan War of 1879 in which the British were fighting in the area of Kabul. In one of the most successful battles in British military history, their troops numbering only 5000 fought off an attack by over 100,000 Afghans. Although he did not shoot the actual battle, Burke's photos of the confident British troops a day before the attack were published as engravings in London Graphic. Burke is known for his sweeping views of troop formations placed against the exotic Afghan backdrop.

Few noteworthy photographs survived from the Franco-Prussian War of 1870; however, photography played a crucial role in the siege of Paris. First, balloons marked "Daguerre" and "Niépce" were used to drop communications into the surrounded city. Later, photographically reduced text was hidden in small containers tied to the tails of homing pigeons enabling those under siege within the city to communicate with French officials outside. Once they realized the French's secret weapon, the Prussians used falcons to attack the pigeons.

The Paris Commune ended with Bloody Week (May 21–May 28, 1871), a period in which 25,000 Parisians were killed by the French government. Various Parisians took some particularly intriguing photos of the Communards posed prior to and after removing the Vendôme Column, an action that symbolized the removal of Napoleonic military barbarism. Bruno Braquehais published 109 photographs, which he personally photographed, in a bound album titled *Paris During the Commune*. Unfortunately, these photographs were later used to identify rebels who were then punished or murdered by the French government. Charles Soulier photographed the city in ruins after the end of the Commune. Eugène Appert fabricated photographs in which he hired actors to stage various scenes from the time of the Commune, and then he would paste in heads of the Communards and reshoot the pasted photo. This handful of contrived images, designed from the perspective of the government, was compiled into a book called Crimes of the Commune.

1890s

The Spanish-American War (April 25–August 12, 1898) is the first war in which photographs of war scenes were quickly disseminated to the public through publication in newspapers. Due to the images in papers owned by Hearst and Pulitzer, Americans saw the atrocities of the Spanish occupation, although often inaccurately reported, and support increased for the Cuban rebel forces. The sinking of the U.S. battleship *Maine*, on February 15, 1898, in the Cuban harbor of Havana was blamed on the Spanish and fueled the decision by the United States to enter the war on April 25. "Remember the *Maine*" became a rallying cry as numerous photography firms marketed stereographs of the event; Keystone View Company in particular made a profit from the selling of such images.

Despite the American public interest in this conflict, few photographers were hired to document the battles. However, Jimmy Hare began a career in which he would become known as the paramount photographer of war. Working for *Collin's Magazine* and later *Collier's* and *Leslie's Weekly*, Hare worked in the field during numerous twentieth-century wars including World War I. While few of his surviving photographs from this period are remarkable, later he would be credited with being the first modern war photojournalist for his courageous efforts in documenting times of war.

International public opinion on the Second Boer War (1899–1902) was also greatly swayed by photographs of the battles and conditions in South Africa. Much of Europe and the United States supported the seemingly simple people of the Boer republic initially in their battle against Britain. Once realizing the power of the medium, the Boers began taking numerous photos of every aspect of the war. The Boers encouraged photos of their weaponry, trenches filled with dead British soldiers, and their prisoners including then war correspondent Winston Churchill.

Through manipulation of these and other photographic images, the British used the media to try and persuade the national and international public to support their troops. Horace Nicholls can be credited with shooting some of the most sentimental images during this period, which engendered sympathy for British troops. Nicholls described his desire to shoot and compose "photographs which would appeal to the artist sense of the most fastidious, knowing that they must as photographs have the enhanced value of being truthful." Numerous other photographers were sent to shoot this war, Reinholt Thiele and H.C. Shelley for example, but many scenes were shot by British soldiers and volunteers who brought their own Kodaks to South Africa. The deplorable conditions of British concentration camps, in which 40,000 women and children died of disease and starvation, were undeniable due to the many photographs taken within the camps of the victims.

Conclusion

While many battles from the larger wars were more frequently photographed, photographs also evidence the colonization by Europeans and Americans around the globe. In many countries, photos of famous cultural sights and exotic locales were taken once an area was conquered. Many of these images were used to lure westerners to become settlers in a certain area and to romanticize the prowess of western cultures at exploration.

Photography was also utilized as a military tool throughout the second half of the nineteenth century. Most military expeditions had a trained photographer as part of their troops. Some armies maintained an entire unit of photographers. Photographic technology was also used to reproduce maps, study military maneuvers and the terrain, and to train servicemen.

In the majority of battles, photographers were successful at performing their role as observers of both sides. Yet in some cases photographers were taken as prisoners when suspected of spying for the enemy. In addition, photographers were frequently warned against photographing any military details and could be imprisoned if such images were ever published. Some soldiers felt uncomfortable with the new technology, as discussed above during the American Civil War. Native American warriors, in fact, frequently avoided the camera for fear that the strange contraption would somehow capture their soul.

The time needed to set up the equipment, the slow development time, and the simple fact that a photographer had to shoot something before them rather than creating it in their mind, made photography a challenging medium to work with in the nineteenth century. Yet, the camera's seeming ability to capture reality also made the desire to take photographs of battlefields and soldiers simply irresistible. By World War II, photographs would be the primary source of images for newspapers informing the public about the war.

DEBRA GIBNEY

See also: Half-tone Printing; Daguerreotype; McCosh, John; Expositions Universelle, Paris (1854, 1855, 1867, etc.); Fenton, Roger; Agnew, Thomas; Victoria, Queen and Albert, Prince Consort; Robertson, James, Beato, Felice; Langlois, Jean Charles, Brady, Mathew B.; Gardner, Alexander; Tintype (Ferrotype, Melainotype); and Nicholls, Horace Walter.

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WARD, CATHERINE WEED BARNES (1851–1913)

Born in Albury, New York January 10, 1851, Catherine Barnes traveled with her parents to Russia in 1872. Introduced to photography in 1886, she built her own studio in the attic of her home. She was appointed associate editor of American Amateur Photographer, wrote and lectured extensively on photography, and became known as an advocate for women in photography with her talk

"Photography from a woman's standpoint" (1890). Her appointment as editor was followed by a visit to England, where she was enrolled into the Photographic Society of Great Britain, and married the photographic journalist Henry Snowden Ward (1865–1911).

Together with her husband, Ward edited *The Photogram* (1894–1905), continued as *The Photographic Monthly*, and *The Process Photogram* (1895–1905), continued as *The Process Engraver's Monthly*. They collaborated on a series of topographical volumes, with photographs taken by Mrs Ward, including Shakespeare (1896, 1897), Dickens (1903), Chaucer (1904), and Lorna Doane (1908).

Snowden Ward died suddenly in New York in 1911, while on a lecture tour to promote the Dickens centenary. Catherine returned to England, but her health deteriorated, and she died in Hadlow, Kent July 31 1913.

DAVID WEBB

WARD, HENRY SNOWDEN (1865–1911)

Henry Snowden Ward was born in Bradford. In 1884 he became associated with the Bradford photographic publishers and stationers Percy Lund & Co, for which he founded and edited *The Practical Photographer* in 1890.

In 1893 he left Lund and with his new wife, Catherine, started *The Photogram* which became *The Process Photogram* in 1895 and *The Process Engravers Monthly* from 1906. American edition and deluxe editions were also published. An annual *Photograms of the Year* also appeared from 1894.

Although his activities as a photographic technical author were extensive Ward was also an active participant in the [Royal] Photographic Society and the Photographic Convention and he was in demand at photographic societies as a judge. He was important in disseminating new discoveries and improvements, particularly in the area of photo-mechanical printing. He was one of the first experimenters with X-rays and wrote a handbook on the subject *Practical Radiography* (1896) and was a founder of the Röntgen Society. Ward was an enthusiastic proponent of record photography and was one of the first to draw attention to the use of photography in press illustration. He established a bureau to supply photographs to the press.

Although Ward's work with his process journals continued until his death from the later 1890s he began increasingly to explore the application of photography to the illustration of literary works. He authored books dealing with Shakespeare (1896), Dickens (1904), Chaucer (1904) and an edition of *Lorna Doone* (1908). These were usually illustrated with Catherine's photographs. He undertook extensive lecture tours on literary subjects and during one to New York he died on 7 December 1911.

His American wife Catherine Weed Ward (neé Barnes) who was an accomplished photographer and photographic journalist in her own right died on 31 January 1913.

MICHAEL PRITCHARD

WARNERKE, LEON (VLADISLAV MALAKHOVSKII) (b. 1837)

A Russian-born civil engineer, Warnerke moved to London before 1870 where he established himself as a photographer and opened one of the earliest photographic laboratories. By 1880 he had business interests in both the United Kingdom and Russia, living periodically in both south-east London and St Petersburg, where he opened a photographic manufacturing facility.

He is credited with the discovery (c.1875) of the tanning effect of pyrogallic acid when used in the development of collodion and, in 1880, with the development of the Warnerke sensitometer, the first effective device for the measurement of plate speed. This he used for pioneering sensitometric investigations of gelatine dry plates and early silver bromide emulsions.

In 1875 he designed a roll-holder for 100-exposure silver bromide collodion stripping paper, predicting the development of Eastman's stripping films in the following decade, and in 1882 he was awarded the Progress Medal of the Royal Photographic Society. From 1889 his factory manufactured silver chloride printing papers.

Warnerke's interests extended beyond photography. He is remembered in monetary circles as one of the greatest banknote forgers of all time, having been responsible for the forgery of several eastern European currencies, most particularly Russian roubles. He was never caught, and supposedly died in 1900—at the age of 63—but it is likely that he faked his own death to escape arrest.

JOHN HANNAVY

WASHINGTON, AUGUSTUS (c. 1820–1875)

Daguerreotypist and teacher

Augustus Washington was born in Trenton, New Jersey, in 1820 or 1821 to a former slave and his South Asian wife. His father Christian ran an oyster saloon in Trenton. Washington's mother probably died shortly after Augustus was born, as records show his father married a woman named Rachel in October 1821.

Attaining a solid education and sharing this knowledge with others dominated Washington's early life. He attended private schools in Trenton alongside white

children until the mid-1830s, when the activities of free blacks were restricted. At that time, educational opportunities for black students were suddenly limited due to the white population's fears about plans that called for the immediate abolition of slavery. In reaction, Washington briefly ran his own school for local African Americans.

Washington was able to further his education at Oneida Institute in Whitesboro, New York, one of only a few private schools that accepted African American students. With the help of abolitionists, he studied there for over a year before a lack of money forced him to leave school and seek employment. Washington's financial woes would continue to interfere with his academic dreams.

In 1838 Washington accepted a teaching position in Brooklyn, New York, at the African Public School. For the next three years he taught in Brooklyn, contributing articles and serving as a subscription agent for *The Colored American*, a new weekly newspaper written by blacks for a black audience. He also attended anti-colonization society meetings and organized voting rights meetings in New York and New Jersey.

Washington furthered his education, first at Kimball Union Academy in Meriden, New Hampshire, and later in the fall of 1843 at Dartmouth College, where he was the only black student. During the winter school vacation, Washington learned the daguerreotype process while visiting family in Trenton. He returned to Dartmouth, making and selling portraits to help pay his school expenses. Unfortunately, he did not earn enough money to continue his studies.

For the next ten years Washington lived in Hartford, Connecticut, working initially as a teacher for black children at the North African School from the fall of 1844 to 1846. Later that year, he opened a daguerreotype studio in Hartford. After the studio had been open a few months, he moved his operation to the city's business district on Main Street. Surviving images from this period indicate that his studio catered to Hartford's white population, attracting many prominent citizens, including Connecticut author Lydia Sigourney and Eliphalet Bulkeley, a Hartford lawyer and judge.

One of Washington's earliest and best-known extant portraits depicts the abolitionist John Brown. Washington posed Brown in an unconventional manner that accentuates the subject's importance. Brown stands with his right hand raised as if taking an oath, while his other hand holds a flag that might symbolize Brown's "Subterranean Pass Way," his plan for an Underground Railroad.

Washington generally posed his customers seated, with the sitter's right arm resting on a table. Men usually faced the camera straight on, while women sat at a slight angle, holding a daguerreotype case, book, or flowers. A broadside for Washington's daguerrean gallery published in July 1851 boasts that the studio "... is the only gallery in Hartford, that has connected with it, a Ladies' Dressing-Room, and has a female in constant attendance to assist in arranging their toilet." The broadside also mentions that Washington had just spent three months in New York,... and availed himself of all the latest improvements in the Art."

Washington's commercial success could not offset the racial problems he and other African Americans faced in the middle of the nineteenth century. In 1850 Congress passed the Fugitive Slave Act, which threatened the freedom of all African Americans. Washington expressed his dissatisfaction with life in America in a letter published in the *New York Times* writing, "Strange as it may appear, whatever may be a colored man's natural capacity and literary attainments, I believe that, as soon as he leaves the academic halls to mingle in the only society he can find in the United States, unless he be a minister or lecturer, he must and will retrograde."

In 1850 Washington married Cordelia Aiken. He searched for a better place to live with his family, and considered relocating to Canada, Mexico, the West Indies, British Guiana, or various countries in South America. In spite of his previous involvement with anti-colonization efforts, Washington ultimately decided to immigrate to Liberia under the auspices of the American Colonization Society. Since its founding in 1816, the American Colonization Society, a private philanthropic organization, had worked to relocate freeborn and emancipated blacks to Liberia on the west coast of Africa. In 1847 Liberia became an independent republic, run by many former African Americans.

In November 1853 Washington closed his successful daguerreotype studio in Hartford, Connecticut, and with his wife and two young children sailed for Liberia on the *Isle de Cuba*. He began making portraits shortly after he landed, and his business was an immediate success, selling roughly $500 worth of portraits during his first five weeks of operation. In a letter to John Orcutt, Traveling Agent of the American Colonization Society, Washington wrote: "I put my price down to what people consider cheap, $3 for the cheapest picture, and when I am able to work I go to my room and take some 20, 30, or 40 dollars worth of pictures in a day. I have hired boys whom I send to tell as many as I can attend to." Washington planned to spend six months of the year working as an artist and the remaining six months as a merchant.

Washington's Liberian work is more varied in both style and subject. For his portrait photographs, Washington used several different poses. He photographed Liberia's President Stephen Benson in a near profile. A series of portraits attributed to him, depicting members of Liberia's senate, are much less formal than traditional

studio portraits. The sitters are posed as if working in the Senate chamber. Liberian artist Robert K. Griffin used these images as studies for a watercolor painting of the Senate he created in the mid 1850s. Washington also worked outdoors, producing landscape views of Monrovia that were published by the American Colonization Society. Unfortunately, these images are known only through published engravings.

When business slowed in Liberia, Washington traveled to Sierra Leone, Gambia, and Senegal to ply his trade. Eventually, he exhausted his daguerreotype supplies. He placed orders with suppliers in the United States, but had to wait several months before he received supplies, causing disruptions in business.

Despite his early success as a daguerreotypist in Monrovia, Washington became convinced that the only practical means of securing wealth, prosperity, and political importance in Liberia lay in developing the country's agricultural resources. Washington established a farm on the St. Paul River, twenty miles from Monrovia, where he grew sugarcane and other crops. At its peak, his farm employed more than fifty workers. He also held various positions in Liberia's House and Senate, including speaker.

Washington died in Monrovia, Liberia on 7 June 1875. At the time of his death, he was the owner and editor of the *New Era* newspaper.

Approximately sixty-five portrait daguerreotypes by Augustus Washington are extant. His daguerreotypes are in the collections of the Library of Congress, the Connecticut Historical Society, and the Smithsonian Institution, as well as many private collections.

CAROL JOHNSON

Biography

Augustus Washington was born in 1820 or 1821 in Trenton, New Jersey. He married Cordelia Aiken in 1850. The couple had three children. Washington was one of a small number of African American photographers to work as a daguerreotypist in the middle of the nineteenth century. He initially pursued photography in order to finance his education, selling portraits while studying at Dartmouth College in Hanover, New Hampshire. In 1846 he opened a successful daguerreotype studio in Hartford, Connecticut, where his sitters included the abolitionist John Brown. In 1852 he was awarded a silver medal for his portraits from the Hartford County Agricultural Society. The following year, Washington and his family moved to Liberia, on the west coast of Africa, where he continued to make daguerreotypes until he established himself as a farmer, political figure, and businessman. Washington died on 7 June 1875 in Monrovia, Liberia.

See also: Daguerreotype.

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WATERHOUSE, JAMES (1842–1922)

James Waterhouse was a career soldier who made significant contributions in a number of technical and historical areas of photography. He was an industrious writer who combined a desire to innovate with aesthetic awareness and an antiquarian's sensibility. His keenness to explore unusual avenues was tempered by a readiness to retract when they turned out to be cul-de-sacs. He showed a willingness to go back to first principles to learn lessons of contemporary relevance, as with his examination of the daguerreotype process. His reputation has not endured for a number of reasons: the specialised nature of the subjects he scrutinised; because many of his articles were published in India and did not achieve a wide circulation; and because his findings were often incorporated into the research of later historians without appropriate attribution.

Waterhouse began his military training at the East India Company's Addiscombe College, where he was probably introduced to photography. Most of his service was spent in India as Assistant Surveyor-General. Part of the work of the Survey of India was concerned with making the production of maps and engineering plans more efficient, and Waterhouse researched improved techniques of photo-mechanical reproduction, as described in Charles Black's 1891 overview of the work of the Indian Surveys.

In 1878 Waterhouse toured European photographic laboratories, notably the Military Geographical Institute in Vienna, augmenting his findings with his own experiments, as a result of which he introduced improvements in photo-collotype and photolithography. In 1882 he developed a heliogravure technique for producing halftone prints. In 1887, after another visit to Vienna, he introduced a photo-etching process that was a great im-

provement over photo-collotype because it had greater resistance to variations in temperature and humidity, and could make far more impressions.

He became an authority on photography under tropical conditions, making numerous chemical trials using ingredients available locally. After confirming Vogel's 1873 finding that the sensitivity of plates to red and green could be enhanced, he examined the efficacy of other dyes, notably eosine, which in 1875 he discovered had the effect of increasing the sensitivity of haloid salts of silver to yellow light. In his presidential review for the Asiatic Society of Bengal in February 1889 he was able to outline the usefulness of eosine in preparing orthochromatic plates for use in copying paintings and photo-spectroscopy. That year he also established the effect of alizarine blue in increasing the sensitiveness of gelatine dry plates to the red end of the spectrum.

As well as his scientific studies, Waterhouse undertook three trips around central India in 1862 during which he took large quantities of photographs under difficult conditions for the pioneering ethnographic study *The People of India*, published in eight volumes between 1868 and 1875. He participated in the observations of the total solar eclipses of 1871 and 1875. For the observation of the transit of Venus in 1874 he took 100 photographs at Roorkee in India, and was fortunate to take the only sharp image of all the expeditions.

In 1875 he published the results of experiments on the solar spectrum using an aniline blue dye he had obtained from a local market. This enabled him to record lines in the solar spectrum less refrangible than A, but reversed: absorption lines appeared opaque on the transparent body of the spectrum instead of the normal transparent on an opaque body. He amplified these findings in a paper read to the Royal Photographic Society (RPS) in 1898 in which he noted that the degree of reversal tended to be a function of length of exposure and varied according to the stain used.

In 1890 Waterhouse found that adding thiourea to an alkaline developer caused a reversal of the image on dry plates but without a significant increase in the length of exposure, and in the same year he examined guaiacol as a cheaper alternative to catechol as a developer for dry plates. The following year he examined the generation of electrical current during development of gelatine dry plates. He returned to guaiacol in 1893, reporting on chemical analyses of it and allied phenoloid compounds, and in an addendum noted that the Lumières in Lyon had found that guiaicol in its pure form was not a developer, and that any developing action was caused by impurities. He followed up a paper by the Lumères in 1899 on the efficacy of fatty amines as accelerating agents, establishing that dipropylamine was the best but of limited practical benefit because of its price.

In 1893 he published a paper on the effect of light on silver salts and devoted the 1899 Traill Taylor Memorial Lecture to an analysis of the daguerreotype process and the lessons it held concerning the action of light on silver haloid compounds. The theme was continued in a paper he presented to The Royal Society the following year on the degrees of sensitivity of metals to light, in which he reported a wide range of experiments conducted on different forms of silver surfaces, as well as other metals, in order to examine the chemical reactions involved.

During his retirement,Waterhouse engaged more in historical research, but always with an eye on contemporary relevance. He studied the early history of the telephoto lens, and his influential paper on the camera obscura gathered a large number of references, in the process demolishing Porta's claim to have invented the device. He surveyed the pre-history of photography in the Smithsonian Institution annual report of 1903. Significantly, his 1905 presidential address to the RPS was on "by-ways of photography."

As well as technical articles, he was happy to write for a more popular audience, for example contributing an article on Niepce's early photographic work with bitumen to *Penrose's Pictorial Annual* for 1913–1914. He organised the Victoria and Albert Museum's 1905 *Loan Exhibition of Process Engraving*, for which he wrote the catalogue's introduction. Waterhouse was awarded the RPS's Progress Medal in 1890 for his spectrographic work on dyes and the development of orthochromatic photography, and the Voigtländer Medal of the Vienna Photographic Society in 1895 for his contributions to scientific photography.

TOM RUFFLES

Biography

James John Waterhouse was born 24 July 1842 and joined the Royal Bengal Artillery at 17. From July 1866 he spent five months with the Great Trigonometrical Survey at Dehra Dun learning photozincography before becaming Assistant Surveyor-General in charge of the photography section in the Surveyor-General's Office in Calcutta. As well as writing on photography, he also published on general matters relating to the Survey. He retired in 1897 with the rank of Major-General, when he returned to England. He never married. Among other positions, he was President of the Asiatic Society of Bengal from 1888 to 1890, President of the Photographic Society of India from 1894 to 1897, and President of the Royal Photographic Society from 1905 to 1907. He became a Fellow of the Royal Astronomical Society in 1876. He died at Eltham on 28 September 1922.

A portrait of James Waterhouse appears in *The Photographic Journal*, vol. 27 (1903): 217.

See also: Heliogravure; and Daguerreotype.

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WATKINS, ALFRED (1855–1935)

Following practical experience with the wet-plate process in the 1870s, Alfred Watkins welcomed the arrival of the dry plate, and within a few years, his accumulated skills encouraged him to address some of the perceived complications of photography. In the 1880s, he worked as a commercial traveller in Hereford, and annexed an out-building to set up the Watkins Meter Company, where he devised instruments to control bakery processes, as well as meters to simplify photographic tasks. His background knowledge allowed him to compress a number of associated factors into one single function.

On the death of his father in 1889, Watkins declined to join the family firm, but concentrated on local history and photography. In 1890, he addressed the Society of Chemical Industry to launch his Standard Exposure Meter, which combined an actinometer and calculator, in a tubular form. By analogy, the actinometer related the time to darken a sensitised paper, to camera exposure. A chain served as a pendulum for counting the actinometric record (that is, the strength of the ambient light) as well as timing seconds (for the chosen plate), and the calculator expressed five variable factors as the exposure recommendation. By dispensing with his "subject factor," Watkins introduced the simpler Junior Meter in 1895, along with the New Standard Exposure Meter, which was "absolutely complete for all problems," including copying, enlarging and contact printing. The compact Watch Exposure Meter followed and the pendulum survived, but the movements were simplified to a single scale. Watkins' ideas on photometry kept pace with improvements in photography, and in 1902, the design of the Watkins Bee Meter anticipated interchangeable printed discs at a later date to cope with cinematography, colour and studio conditions. (The Queen Bee Meters of 1903 and 1908 were de-luxe versions in a silver case and complete with a ball and chain pendulum.) Other meters included the Focal Plane (1907), the Colour Plate (1909), the Hand Camera and the Chronograph (1910), the Indoor (1911), and in 1920, the Watkins Snipe Meter, a simple meter for avoiding under-exposed snapshots.

All designs were supported by practical tests and Watkins' five axioms ("the standard truths"), identified the essentials of exposure, from which he determined a protocol to determine emulsion speed. That is, "an object of average colour twenty-five feet from lens" became the "standard" for two seconds of' exposure to mid-day June sunlight in England; his basic plate speed (1). Using this criterion, he issued annual lists of speeds, until he was able to derive his required values from speeds determined by the Hurter and Driffield method. In 1894, he promoted a simple system for correct development, which applied a factor (the Watkins Factor) to the appearance of the negative image.

In 1910, Watkins received The Royal Photographic Society's Progress Medal for his "methods and applications" relating to exposure and development. In spite of his photographic achievements, in many circles Alfred Watkins was better known as an antiquarian, who surveyed churches, pigeon-houses and standing crosses, prior to announcing controversial studies of ancient track ways, and founding the Old Straight Track Club in the 1920s.

RON CALLENDER

See also: Royal Photographic Society.

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WATKINS, CARLETON E. (1829–1916)

American photographer

Well-known photographers of the nineteenth-century American West such as Charles Roscoe Savage, Timothy O'Sullivan, Jack Hillers, Andrew Joseph Russell, and William Henry Jackson are all praised for a variety of reasons. They documented historical events, they traveled to the remote corners of the West and photographed its spectacular scenery, they furthered the budding science of geology, and they documented the natural resources of the West for the United States Congress and the American public. Carleton Eugene Watkins, however, in addition to doing all of the above also gained critical acclaim as an artist. Not only did Watkins win praise from his contemporaries in the Eastern United States and also in Europe, but he was also praised by subsequent generations of art historians and critics. Initially Watkins was recognized mainly for his photographs of the area now known as Yosemite National Park. Despite the difficulties of taking mammoth-plate negatives in an incredibly remote area, these images were known for their composition, flawless character, depth of detail, and excellent use of light. Watkins, however, photographed up and down the West Coast (as far north as British Columbia and as far South as Mexico) and also in Arizona, Nevada, Utah, Idaho, Montana, and Wyoming. While it is true that throughout his life he pursued nature's "grand view," Watkins also sought to show the subtle relationships between man and nature.

C. E. Watkins was born on November 11, 1829, in Oneonta, New York the oldest of eight children. In 1851 he left New York for California with another Oneonta native, Collis Huntington. Huntington was destined to become one of the most wealthy and powerful men in California and throughout Watkins' life he received financial support from his friend. Watkins initially worked as a clerk in Huntington's Sacramento store, but after a fire destroyed the store in 1852 he became a clerk in a bookstore owned by George W. Murray. Murray and Watkins would relocate to San Francisco in 1853 and in the fall of 1854 well-established daguerreotypist Robert Vance asked Watkins to temporarily replace an employee who had suddenly left his job.

Watkins learned the job so well that Vance kept him employed taking studio portraits. In 1856 Watkins left Vance to run a studio in San Jose (specializing in ambrotypes of babies), but apparently Wakins left that job as well before the end of the year. Watkins's activities

Attributed to George Davidson. Pack Train-Resting. From the Mount Conness, Sierra Nevada. *The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.*

between 1856 and 1860 are not entirely clear. In 1858 he took photographs of the Guadelupe Quicksilver Mine for a land fraud case. In 1859 and 1860 he was hired by John C. Fremont and Trenor William Park to photograph their Mariposa estate. Watkins also took photographs of the New Almaden and New Indria Mines and Washerwoman's Bay at San Francisco. In 1861 his photographs were used as evidence in *U.S. v. D. and V. Peralta*. It was this experience that prompted him to build one of the earliest mammoth-plate cameras in America, capable of taking eighteen by twenty inch negatives.

By 1861 Watkins had established a more or less permanent studio in San Francisco. Although by that time he had earned a reputation as a competent outdoor photographer, it was the 30 mammoth-plate negatives and the 100 stereo-view negatives Watkins took of the Yosemite area that brought him national and even international praise. Watkins was not the first photographer to visit Yosemite (C.L. Weed had taken pictures there in 1859). He was, however, the first to use a mammoth-plate camera to achieve incredibly detailed views. In 1862 Goupil's Art Gallery in New York City featured the Yosemite photographs in an extremely popular exhibit. Copies of his Yosemite images won praise from Oliver Wendell Holmes, Ralph Waldo Emerson, and from the leading American photographic magazine, the *Philadelphia Photographer.* Watkins's photographs also no doubt played a part with legislation passed by the United States Congress in 1864 declaring Yosemite to be "Inviolate." Watkins became the first American photographer whose prints were displayed as fine art.

Due to the widespread interest with his Yosemite pictures, Watkins's other photographic exploits have not received as much attention. For three decades he crisscrossed California photographing railroads, mines, different species of trees, private estates, old Spanish missions, the Sierra Nevada mountains, the coastline, the San Francisco Bay area, and, of course, Yosemite. In 1867 Watkins also took the first of many out-of-state trips, photographing Oregon's coastline, settlements, mountains, and the Columbia River. On later trips he photographed the Comstock Lode mines in Nevada (1871 and 1875), scenes along the Central Pacific and Union Pacific Railroads in Nevada and Utah (1873), the Southern Pacific Railroad route in Arizona (1880), the coastlines of Washington and British Columbia (1882), and scenes in Idaho, Montana, and Yellowstone National Park (1884 and 1885). His last major trip was to the mines in Butte Montana in 1890.

Despite widespread acclaim, poor business decisions and bad fortune hurt the aging photographer financially. In the early 1860s he failed to identify and copyright his work and consequently many of his views were pirated and reprinted. In the mid-1870s his studio and collection of negatives were seized by creditors and sold to a competitor, I.W. Tabor, who reissued many of the images without credit. As tourism increased in the late nineteenth-century, his artistic style did not work well with tourists who wanted cheap and predictable images. Watkins' had trouble paying his bills and was forced to change studio locations on a number of occasions. Furthermore he did not advertise, instead relying on word of mouth, which no doubt created confusion for his would be customers. At the brink of almost complete destitution in the 1890s, his old friend Huntington stepped in and gave Watkins a small ranch near Sacramento as a retirement home. He lived at the ranch for several years before moving back to San Francisco. Unfortunately for posterity, the 1906 San Francisco earthquake destroyed all of his negatives along with a priceless collection of early California daguerreotypes. Tragically, this material was about to be transferred to the state for safekeeping. After the earthquake Watkins's health and mind continued to deteriorate and he died in 1916 at the Napa State Hospital for the Insane.

Daniel M. Davis

Biography

Carleton E. Watkins was born in 1829 in Oneonta, New York. He moved to Sacramento California in 1851 and worked as a clerk and as a carpenter before being trained by Robert Vance as a portrait daguerreotypist. He soon moved to outdoor photography and he took a variety of commissions around the San Francisco Bay area between 1856 and 1861. The images that would make him famous, however, were taken in 1861 of the spectacular Yosemite region. These photographs won praise throughout the United States and even in Europe and were probably the first photographs taken by an American to be considered fine art. Watkins was not only a technical expert at using a mammoth camera to produce incredibly detailed and flawless negatives, but he also had an eye for composition and light. Although Watkins is best known for his Yosemite images, he traveled throughout the West Coast and in other western states in the 1860s, 1870s and 1880s. These later views show a sensitivity to the relationships between the frontier American settlements and the natural resources that supported them. Although Watkins had a generous and warm personality, he was a poor businessman. He suffered a series of financial and personal setbacks, and at one point he and his family (he married Frances "Frankie" Henrietta Sneed in 1879) were living in a railroad car. He was fortunate though to have the support of Collis Huntington, Josiah D. Whitney and others who supported him fiscally and encouraged him artistically. He died in Napa, California in 1916.

See also: O'Sullivan, Timothy Henry; Russell, Andrew Joseph; Jackson, William Henry; Vance, Robert; Weed, Charles Leander; and Goupil & Cie.

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WATKINS, HERBERT (1828–C.1901)
English portrait photographer

George Herbert Watkins was born in Worcester, England, on July 12, 1828, and was still alive at the time of the 1901 census, aged 73, and living in the Kensington Workhouse. At the same date, his wife Augustin was listed as a widow living alone.

Watkins' first studio opened at No.179 in London's Regent Street in the mid 1850s, producing high quality portraiture, and by 1858 had moved to No.215. His first public display of his celebrity portraits was at the 1856 Exhibition of the Photographic Society in London. In the 1857 Exhibition he included portraits of Owen Jones, George Cruikshank, and others, and a fine portrait of Charles Dickens working at his desk.

His *National Gallery of Photographic Portraits* with accompanying texts by Herbert Fry, a ten-part 'photographic serial' was published in 1857 continued publication into 1858, each issue containing four or five portraits. By 1857 he was additionally producing still life images and, most particularly, microphotographs. Along with John Benjamin Dancer, George Shadbolt and Alfred Rosling, he was a leading figure in the production of these tiny images. Watkins marketed many of his portraits as cartes-de-visite throughout the 1860s and 70s, subjects including celebrated portraits of Wilkie Collins, Michael Faraday and many others.

The 1871 census listed him as living alone in St. Pancras.

JOHN HANNAVY

WATSON, WILLIAM (1815–1881) & SONS
Optician and optics manufacturer

William Watson established his business as an optician in 1837 in London. It moved to 313 High Holborn in 1862 and remained there until 1957 before moving to Barnet, Hertfordshire, where it had had a manufactory since 1906. In 1957 the firm was acquired by Pye and in 1967 it was taken over by Philips, finally closing in 1981.

Watson's son, Thomas Parsons Watson, was responsible for extending the firm's business into optical instrument manufacturing in 1876 when it began making microscopes, one of its most successful and long-lived product lines. A manufactory was established at Dyer's Buildings at the rear of the main premises. The manufacturing of cameras and photographic equipment commenced about the same time. By 1888 extra manufacturing capacity was acquired at Fulwood Rents in Holborn, and finally in 1906 all manufacturing was moved to High Barnet. The factory at Barnet was destroyed by fire in 1910, was rebuilt, and further extended in 1936 and 1950.

Although microscopes continued to be important, photography increasingly occupied an equal position within the firm and in 1878 Watson was appointed the exclusive selling agent for Charles Bennett's gelatine dry plates. The firm's cameras included traditional mahogany tailboard such as the Tourist of 1883 and field cameras for studio and outdoor use with the patented Acme of 1889 being one it's most successful lines. In 1886 their Detective camera was one of the earliest hand cameras available. A number of patents were taken out relating to various photographic improvements.

The firm was an early adopter of standardisation in camera manufacturing and in January 1888 announced that all their own cameras would be built to standard gauges with interchangeable fittings and dark slides. These cameras were identifiable with serial numbers from 6000 onwards starting from January 1, 1888.

Watsons introduced the Vanneck hand camera in 1890 which used an Eastman-Walker roll holder. The camera was still being made in 1902. The Alpa of 1892 was a popular drop-baseboard camera and the 1898 Gambier-Bolton camera was a specialist reflex camera for use with long focus lenses. It had been designed by F W Mills and named after a well-known nature photographer. A twin lens camera appeared in 1894. The firm retailed more complex mechanical cameras from other manufacturers, such as the stereo binocular and monocular models made in Germany.

Their own wood cameras were usually made up in batches of fifty. Watson sold directly in Britain and overseas, and made cameras for other companies to sell under their own name. An Australian sales office

was established in Melbourne in 1886 which operated semi-independently for many years.

It also made a series of portrait, rapid rectilinear, wide-angle and landscape lenses which were later fitted with iris diaphragms. Their Holostigmat Convertible of 1905 was computed by Alexander E Conrady (1866–1944) the firm's optical advisor who was later professor of optics at Imperial College.

Watson was active in areas allied to photography. In 1895 it entered the new area of Röntgen (or X-ray) photography making apparatus in its own works and giving demonstrations in London hospitals. In 1911 a separate branch was established to handle this field and Watson & Sons (Electro-Medical) Ltd was incorporated in 1915, eventually becoming part of GEC. It was briefly involved with cinematography, introducing in late 1896 its Motograph, a well-regarded compact 35mm camera/projector for amateur use. Films were also supplied.

During the early twentieth century until the Second World War, the firm continued to sell its Premier tailboard, Acme field and Alpha hand and reflex cameras but photography became secondary to the manufacture of scientific and optical instruments. One notable exception was the granting of a patent (current untraced) to the company with A C Edwards in 1909 for an antinous release, more generically known as a cable release. Watson was the sole licensee and had sales in the hundreds of thousand.

During the Second World War, it subcontracted the making of cameras to Gandolfi while it concentrated on producing optical munitions. After the war the last family connection with the firm was severed in 1949 when W E Watson-Baker sold his interest to Captain James Cook, a financier and other than the standard Premier camera only special purpose cameras were then advertised.

Michael Pritchard

See also: X-ray Photography.

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WATTLES, JAMES M. (B. 1812)

The only reference to James Wattles in contemporary accounts of the evolution of photography comes from a meeting between Wattles and Henry Hunt Snelling, recounted in Snelling's 1849 book *The History and Practice of the Art of Photography*.

According to Snelling, Wattles, of New Harmony, Indiana, claimed to have successfully made paper negatives with his camera obscura as early as 1828, at the age of only sixteen.

After meeting Wattles, who was 'wholly ignorant of even the first principles of chemistry, and natural philosophy,' Snelling became convinced of Wattles' claim to have produced 'solar picture drawings' on paper soaked in what Wattles described as 'caustic' and then 'common potash.' After exposures of 45 minutes, he then fixed them in a salt solution and assured Snelling that he 'plainly perceived the effect, in the gradual darkening of various parts of the view, which was the old stone fort in the rear of the school garden, with the trees, fences, &c.' Despite the imperfection of his efforts, Wattles reportedly persevered with his experiments and was increasingly satisfied with the results. He offered Snelling several names who could support his claim, but no further account of his experiments have been traced.

John Hannavy

WATZEK, HANS (1848–1903)

German photographer

Hans (Johann Josef) Watzek was born on December 20, 1848, in Bílina/Tschechien to a buyer. He visited the academies of arts in Leipzig and Munich and worked toward end of the 1860s as a freelance artist. In Vienna Watzek received training as an art teacher in 1872 at the college of arts and crafts. He taught in Boehmen and established himself starting from 1875 in Vienna. In 1891 he joined a group of amateur photographers in Vienna (the later Camera Club Vienna). By experiments with a simple pinhole camera and the "Monokel" (a simple achromatic eyeglass lens, which is used as a lens in a camera) he, began to consciously use Unschaerfe (blurring) as style means. He dedicated himself to the landscape of his immediate surroundingsof Vienna. In 1893 he was accepted as a member of the Linked Ring Brotherhood London. Together with Heinrich Kühn and Hugo Henneberg, Watzek developed in 1896 multiple gum prints. He was, with Kühn and Henneberg one of the Vienna trifolium from 1897, marking his work with a three-leafed clover symbol. Watzek is considered one the most important Austria Pictorialists. He published numerous articles on primarily technical topics in German-language technical periodicals. Watzek died on May 12, 1903, in Vienna after a long illness.

Astrid Lechner

WAXED PAPER PROCESS

When Gaspard Feix Tournachon called, Nadar (1820–1910) wrote in his memoirs "Photography whistled and Le Gray came running." He characterized the exuberant

spirit of one of the most zealous and creative artists to try their hand at photography. The painter Gustave Le Gray (1820–1882) began experimenting with the daguerreotype as early as 1847 and the following year was using variants of Henry Talbot's calotype process. Within three years, he had produced a highly innovative photographic system, the waxed paper negative process. Although the process is part of the paper negative family, it uniquely stands apart from the decade-old calotype announced in 1841.

The crucial difference between the calotype and the waxed paper process is in the preparation of the paper. In the calotype process, a sheet of high quality paper is sensitized with a combination of silver halides, exposed in a camera (either in a dry state or slightly damp), removed, developed, and fixed with sodium thiosulphate. After processing, the translucency of the paper negative could be increased by saturating with wax. This helped increase the contrast and shorten printing times.

In most respects, the preparation of the waxed paper negative parallels the preparation of the calotype, except for one important difference: in Le Gray's waxed paper negative process, the paper is saturated with wax *before* the chemical sensitization. This simple reversal of one step profoundly alters the qualities of the paper. First and foremost, saturating the paper with wax evens out the texture of the paper and fills the interstices of the paper fiber matrix. In its natural state, paper is an overlapping, random web of fibers, held together by chemical and physical interactions. Light can and will travel through this matrix, but will be reflected off of each paper fiber in its path, decreasing in intensity as it passes through. By filling in the interstices of the fiber matrix, the wax changes the sheet's refractive qualities, allowing the light to pass through in a more direct path. The treatment with wax renders the paper negative more homogenous then the calotype and the individual paper fibers will not be as visually pronounced in the final print. The wax, however, does not completely fill the paper, and the sensitizing chemistry is still able to bond and anchor to the cellulose.

A second advantage of the waxed paper process was improved wet strength. The time required to develop a paper negative could be considerable, an hour or more, especially if the photographer was trying to compensate for underexposure. This meant prolonged submersion in an aqueous solution, at the end of which the operator had to handle a water-logged sheet of paper. With the waxed paper negative, much thinner, machine made papers could be employed without the fear of tearing.

Finally, the most practical advantage offered by the new negative process was its impressive longevity. Because of the protective qualities of the wax, a week's supply of fully prepared paper could be stored, ready for photographic excursions. This was an incredible boon to travelling photographers who could prepare negatives ahead of time and consequently lighten the load of photographic equipment required for travel. There were, however, contradictory reports from those travelling in extreme climates. Some accounts suggest difficulty with the process, such as Maxime duCamp (1822–1894), who, despite being instructed by Le Gray himself, failed all attempts at the waxed paper process once he reached Egypt and turned to a variant of the calotype, the wet paper process.

Paper negatives are hand made objects, subject to variations at every stage of preparation, from the selection of paper to sensitizing, processing and printing. However, during the first decade of photography, the range of off-the shelf photographic supplies increased and by mid 1850, waxed paper negative devotees could purchase pre-waxed and pre-iodized papers. In some products, quality was suspect, as noted by the Scottish surgeon and photographer Thomas Keith (1827–1885):

> I have always waxed my own paper, as what I bought waxed was so bad that the half of it was generally useless. By doing it yourself you have it much better done, and it is much more economical then buying it waxed. (*Photographic Notes*, June 10, 1856)

Post-processing manipulations paralleled those of the calotype, including re-fixing, chemical intensification and even reheating the already waxed sheet in an effort to improve weak negatives. Flaws in the image such as spots and stains could be retouched, although the waxy surface made soft graphite stick and powder the media of choice: gouache and watercolor would not readily adhere. Like all other paper negatives, the substrate would easily tear and crease, but was considered robust and durable when compared to the breakable and heavy glass plate negative.

The final image can appear on both the recto and verso of the sheet, and a waxed paper negative can be much darker in normal reflected illumination than its sister process, the calotype. When viewed through transmitted light, however, the dark muddy sheet is transformed into a bright, glowing negative of astounding detail.

Le Gray's endless experimenting led to other innovations and fostered a school of followers who in turn promulgated numerous and unusual modifications to the photographic formulas of the day, such as the turpentine waxed-paper process. Most of the formulas altered the basic process by adding organic components such as gelatin, albumin, collodion, sugar, or lactose. Although the exposures times were reduced, the wax-saturated paper lengthened the processing times and in the hands of a skilled operator, the results were breathtaking.

Some of the greatest photographers of the 19th

century practiced the waxed paper negative. In France, Charles Negre (1820–1880) and Henri Le Secq (1818–1882) followed Le Gray from painting to photography. Victor Prevost (1820–1881) was also trained by Le Gray and traveled to New York. In England, Roger Fenton (1819–1869) was a key photographer in the development of the process, and the young American John Beasley Greene, distinguished himself ca 1856.

Le Gray practiced the wet collodion and waxed paper processes side-by-side throughout much of his photographic career, but by the 1870's he and the rest of the photographic community had completely turned to glass plate photography.

LEE ANN DAFFNER

See also: Calotype and Talbotype; and Daguerreotype.

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WEDGWOOD, THOMAS (1771–1805)

English experimenter

Wedgwood, collaborator with Humphry Davy on the first published account of photographic experiments, was the son of the famous English potter and industrialist Josiah Wedgwood. Educated largely at home under the direction of his wealthy and doting father, Tom Wedgwood was given expert tutoring in almost every field of knowledge, from science to art, and counted as friends some of Britain's leading intellectual figures. Although handicapped by a lifelong illness that eventually was to take his life at an early age, he nevertheless worked on a number of projects that attracted the attention of his peers, some practical and some merely philosophical. However it is for his experiments towards a photographic process that he is best remembered today.

It is unclear when he began these experiments. In November 1790, for example, he was working with nitrate of silver at his father's ceramics business, leading to his invention of a 'silvered ware' in about February 1791. He also had essays on his observations of light read at the Royal Society, and wrote speculatively about optics and "Time, Space, and Motion." These last interests he shared with his close friend, the English poet Samuel Taylor Coleridge, whom he first met in 1797. So close were they that Tom and his brother granted Coleridge a lifetime annuity that enabled the poet to travel to Germany in 1798 and study German idealist philosophy at first hand. Exposure to these radical new ideas undoubtedly stimulated Tom Wedgwood's thinking during the period in which he experimented with photography.

Despite the existence of some undated letters referring vaguely to "Silver Pictures," the only noncircumstantial evidence of these experiments is an essay that appeared in the first issue of the *Journals of the Royal Institution of Great Britain* in June of 1802. Co-written with its editor, the twenty-four year old Davy, the essay was titled 'An Account of a Method of Copying Paintings Upon Glass, and of Making Profiles, by the Agency of Light Upon Nitrate of Silver,' and describes various experiments the two men had undertaken with white paper or leather moistened with a solution of silver nitrate and exposed to light.

> White paper, or white leather, moistened with solution of nitrate of silver, undergoes no change when kept in a dark place; but, on being exposed to the day light, it speedily changes colour, and, after passing through different shades of grey and brown, becomes at length nearly black...
>
> The condensation of these facts enables us readily to understand the method by which the outlines and shades of painting on glass may be copied, or profiles of figures procured, by the agency of light...
>
> The images formed by means of a camera obscura, have been found to be too faint to produce, in any moderate time, an effect upon the nitrate of silver. To copy these images, was the first object of Mr Wedgwood, in his researches on the subject, and for this purpose he first used the nitrate of silver, which was mentioned to him by a friend, as a substance very sensible to the influence of light; but all his numerous experiments as to their primary end proved unsuccessful.... Nothing but a method of preventing the unshaded part of the delineation from being coloured by exposure to the day is wanting, to render the process as useful as it is elegant.

Despite their inability to make their images permanent, in the space of five short pages Davy and Wedgwood describe an impressive range of photographic ideas and applications. Wedgwood apparently began by attempting to capture the image formed by the camera obscura, and only subsequently moved on to the problem of copying pre-existing images. Of these, the

two experimenters attempted to copy paintings on glass (such as those used for projection devices) and "profiles of figures" (perhaps a reference to silhouette portraits). They also made contact prints using leaves and insect wings as well as engraved prints. Davy tells us that he himself made images of small objects using a solar microscope and "prepared paper." Their friend Anthony Carlisle recalled in 1839 that he had also undertaken several experiments with Wedgwood in about 1799 "to obtain and fix the shadows of objects by exposing the figures painted on glass, to fall upon a flat surface of shamoy leather wetted with nitrate of silver, and fixed in a case made for a stuffed bird."

Amidst these creative variations on the basic idea, Wedgwood and Davy also undertook numerous comparative experiments using different materials, solutions and processes. They exposed both white paper and white leather moistened with a solution of nitrate of silver in direct sunlight and then in shade, as well as under red, yellow, green, blue and violet glass. They tried, unsuccessfully, to remove the delineations so produced with both water and soapy water, and attempted, equally unsuccessfully, to prevent further development by covering the image with a thin coat of varnish. Davy also experimented with different solutions of nitrate and water, and with muriate of silver (a chloride which he found to be less suited to the task than the nitrate). He even gives practical advice about how best to apply the resulting solution to one's paper or leather. Finally, he not only recognizes the lack of image permanency as a problem but also suggests a plausible theoretical answer to it—on which subject, he tells us, "some experiments have been imagined" (although, it seems, never undertaken). So, thirty seven years before Daguerre and Talbot were to announce their own discoveries to the world, the 'Account' gives us many elements of the concept of photography. Sadly, Wedgwood was to die only three years later, and Davy, then in big demand as an experimental scientist, went on to other projects and did no further work on photography. However their 'Account' was republished in numerous European and American journals and informed the later and more successful experiments of, among others, William Henry Fox Talbot.

GEOFFREY BATCHEN

See also: Gelatin Silver Print; Multiple Printing, Combination Printing, and Multiple Exposure; Davy, Sir Humphry.

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WEED, CHARLES LEANDER (1824–1903)

American photographer

Charles Leander Weed was born on July 17, 1824, in New York State. Raised in Wisconsin, he traveled to

Attributed to Charles Weed or Eadweard J. Muybridge. Mirro View of El Captain. Yo-Semite Valley.
The J. Paul Getty Museum, Los Angeles © The J. Paul Getty Museum.

California at an unknown date. His photographic career began in 1854 as a daguerreotypist, and he later formed a partnership with Robert Vance between 1858–1859. Weed rose to prominence after his June 1859 trip to Yosemite Valley and publication of some of his photographs as engravings. Carleton Eugene Watkins was inspired by these images to create his own large prints of Yosemite. Both Weed and Watkins exhibited their prize-winning "mammoth-plate" prints at the 1867 Paris International Exposition. A remarkable aspect of Weed's career were travels to Hong Kong, China and Honolulu where he established four studios between 1860 and 1866, returning to California in 1861 before going back to Hong Kong via Honolulu in 1865. From 1864 to 1870 Weed associated himself with publisher Lawrence & Houseworth (later Thomas Houseworth & Co.), then operated his own studio or worked for other photographers and photo publishers in the 1870s. Married to Sarah P. Weed (born March 30, 1833) in the mid-1870s, they resided in Oakland, California, until his death on August 31, 1903. Weed's photographs survive only as prints in various formats, principally stereographs and albumen prints, with the Bancroft Library, University of California, Berkeley, and the New York Public Library, holding significant examples, including the 1864 Yosemite Valley mammoth-plate prints.

DAVID MATTISON

WEGENER, OTTO (1849–1922)

Otto Wegener was born in Helsingborg, Sweden, and moved to Paris, France, 1867. Nothing is known about his introduction to photography; all we know is that he opened his magnificient studio at the fashionable address 3, Place de la Madeleine in 1883, successfully competing with Nadar and Reutlinger for the elite audience.

He had then already simplified his name to Otto, a signature that gleamed in gold above the sixth floor on the building. He maintained contacts with the Swedish colony of artists and the writer August Strindberg dined in his house 1894.

A Swedish journalist wrote an appendix to a book about Paris and described him as the leading photographer in the capital, representing France at the Paris World Exhibition in 1900. Only one photographer made more money than Otto, and still did not have his aristocratic customers, nor his artistic merits. Visitors lined up outside his gallery on Rue Royale—where one of his apprentices, Edward Steichen, was given an exhibition. Otto even represented France in international photo exhibitions in Dresden 1908 and Leipzig 1914.

That year, 1914, the leading Swedish pictorialist Henry B. Goodwin visited him and wrote a piece in a monthly photo journal describing his four storey combination of studios, parlours, dark-rooms and living quarters, all filled with antiques, paintings and the art noveau furniture he loved to design.

He had studied the new reproduction methods as oil transfers and gum prints with Robert Demachy and Constant Puyo, and he still photographed with an Eidoscope soft focus lens.

Despite this success, he is usually overlooked in major works on the history of photography, and only few of his negatives can be traced in French archives.

PÄR RITTSEL

WEHNERT-BECKMANN, BERTHA (1815–1901)

Bertha Beckmann was born January 15, 1815, in Cottbus; there is no knowledge about any training until she met the "mechanicus," Eduard Wehnert in 1839 at Dresden. He opened a photographic studio in Leipzig in 1842 which she operated until 1843 in Dresden. She married Eduard Wehnert in 1845 and carried on his business after his sudden death in 1847 under the name of Wehnert-Beckmann. From 1849 to 1851, Bertha Beckmann owned a studio in New York City, and around 1866 there seemed to have existed a branch of her businesses in Vienna. Bertha Wehnert-Beckmann seemed to be the female entrepreneur par excellence in 19th century photography, any business she founded had prospered within a year or two, mostly concentrating on hitherto unusual aspects of portraiture like children photography. Basically, her work was of very good quality but in no way different from typical work, with the exception that she had a sensitive approach to human beings. She never seemed to have aimed at any fate but fulfilling the needs of her clients; her historical importance lies in the fact that she successfully practised photography in a male world for nearly half a century. She practised photography until 1883, with the assistance of her brother Rudolf Julius Arnold Beckmann. Bertha Beckmann died in Leipzig on Dec.6, 1901.

ROLF SACHSSE

WELFORD, WALTER D. (d. 1919)

Welford was born in Newcastle, and began his career as a journalist for the newly established sport of cycling. He founded and edited *Cycling* (1878–82), and issued a pioneer annual *Wheel man's Yearbook* in 1881. In 1884, persistent ill health forced his move to London, where he quickly immersed himself in photography, starting as sub- editor on *Photography*, in the late 1880s.

In rapid succession, Welford founded and edited the *Photographic Review of Reviews*, later revamped as

Photographic Review (1892–1897); the *Junior Photographer*, later entitled *Practical & Junior Photographer* (1894–1903); and *Photographic Life* (1897, published for 3 months), a title which Welford then reorganised to combine his twin interests as "Cycle & Camera" (1897–1898, published for 9 months). None of them, apparently, was particularly successful.

Welford wrote a standard manual on the hand camera (1892, 6th ed., 1901), and compiled with Henry Sturmey, the pioneer cycle manufacturer and publisher, encyclopaedias on photographic apparatus (1887), and optical lanterns (1888).

Ill health blighted his later years, though he remained a member of the staff of *Kinematograph Weekly* throughout World War I, and wrote a number of plays for the cinema. He died at his home in Islington in July 1919. Welford's wife Jeanie (1855–1949) was a talented photographer in her own right, specialising in topographical views, many of which were published in her husband's journals.

David Webb

WELLINGTON, JAMES BOOKER BLAKEMORE (1858–1939)

J. B. B. Wellington was trained as an architectural draughtsman, but following an early association with George Eastman, his career was entirely concerned with photography and photographic manufacturing.

He first met Eastman in the 1880s, and became the first manager of Eastman's British factory in Harrow, England.

During a short but successful career with Kodak, Wellington was responsible for, amongst others, a popular printing-out paper, and, in 1889, one of the first intensifiers for photographic negatives—formulated from silver nitrate, ammonium thiocyanate and sodium thiosulphate.

In 1896, after a short period of time with Elliot & Sons of Barnet, Wellington and his brother-in-law H. H. Ward, established the company Wellington & Ward, manufacturing dry plates. Wellington was scientific and technical director of the company, with Ward taking responsibility for engineering. This company was eventually taken over by Ilford Ltd in 1929.

Wellington, however, was also a photographer of note, joining the Linked Ring Brotherhood in 1892 with the pseudonym of 'Duke.' Like all 'links' he was expected to perform the honorary role of 'Centre Link' for about a month—a presidential role with no authority whatsoever—and assumed that position for three weeks in February 1894.

His finest images, some printed in carbon, were produced in the early decades of the 20th century.

John Hannavy

WERGE, JOHN (unknown)

John Werge arrived in America from Scotland in June 1853. Whilst travelling in the United States, he became acquainted with the leading exponents of the daguerreotype, amongst them Samuel Root, Matthew Brady, Platt D Babbitt and Jeremiah Gurney. He used examples of his work to gain employment in the New York studio of the Meade Brothers as a colourist and 'teacher of colouring' and, in his 1890 book *The Evolution of Photography* recalled demonstrating his skills in colouring daguerreotypes to Gurney and others. He met Babbitt at Niagara Falls, and later recalled that his own photography at the falls had been lost when a fire destroyed the Glasgow exhibition to which he had loaned them. He eventually returned to Scotland.

Werge took over the Monteith Rooms in 1856, the Glasgow photographic studio which had been established in 1846 by John Bernard, and later operated by Bernard and (from 1848) Cornelius Jabez Hughes. He established himself as one of Glasgow's leading portrait photographers, operating the studio for three years.

He returned to America in 1859, and operated a photographic and publishing business at 805 Broadway until at least 1861. Moving to England, he served on the committee of the South London Photographic Society 1868–70, and managed London's Berners Portrait Company 1874/5. *The Evolution of Photography*, published in London by Piper & Carter 1890, offered a first comprehensive history of photography's first fifty years.

John Hannavy

WET COLLODION NEGATIVE

The wet-collodion negative process was developed in 1848 by F. Scott Archer (1813–1857) and first published in 1851. The process achieved popularity by the mid-1850s, dominating all other negative processes until 1881, gradually displacing both the daguerreotype and the calotype processes. The wet-collodion on glass negative process was desired both because the transparency of the glass yeilded high-resolution images, and because exposure times were shorter than for Daguerreotype or calotypes. Finished negatives were generally usually to produce albumen or salt prints.

The process derived its name from the use of collodion in liquid suspension to coat glass plates at the beginning of the sensitizing process before exposure. In the nineteenth century, the collodion used to coat glass plates was made from guncotton, a commercially-available medical dressing. Guncotton was derived from ordinary cotton that had been soaked in nitric and sulfuric acids, thoroughly washed, and dried. The guncotton was then dissolved the in a mixture of alcohol and ether to which potassium iodide had been added. The resulting collodion was a syrupy mixture. This mixture could be

prepared in advance in a shop or laboratory and transported into the field.

Immediately before the image was to be made, collodion was poured onto a clean glass plate, which was continuously tilted to produce an even coating. The size of the plate was dependent upon the required size of the finished print, and plates varied in size from under two inches square, to mammoth plates, measuring in excess of 20 × 24 inches. When the collodion had set but not dried (a matter of seconds), the plate was sensitized by bathing it in a solution of silver nitrate. During this bath, the silver nitrate reacted with the potassium iodide in the collodion to produce light-sensitive film of silver iodide. This sensitizing process could be carried out under yellow light.

While the plate was being sensitized, the camera operator finished composing the scene, set up the camera, and focused on the subject. After removal from the silver nitrate bath, the glass plate, now light-sensitive, was placed in a light-proof holder and transported to the camera while still wet. When the subject was ready and the film holder loaded into the camera, the "dark slide," a movable cover on the film holder, was moved to uncover the plate. The plate was finally exposed to the subject by removing the lens cap; exposure times ranged from less than one second to several minutes, depending upon the intensity of the light, and the age and quality of the collodion. When the proper exposure was made, the lens cap was replaced, and the "dark slide" returned to its closed position.

After exposure, the holder containing the plate was removed from the camera, returned to the darkroom and immediately developed in a solution of pyrogallic and acetic acids (a later refinement of the process used ferrous sulfate as a developer). The image became visible within a few seconds as the areas struck by light in the camera turn to metallic silver. When development was complete, the developing solution was removed by a wash of clean water. After fixing—usually in a tray of sodium thiosulfate (commonly called sodium hyposulphate in the nineteenth century)—to remove the unused silver halides, the plate was no longer sensitive to light, and could be removed from the darkroom and washed in fresh water. An alcohol lamp was then used to dry the plate. Once dry, and while still warm, the plate was coated with a protective varnish made from gum sandarac, alcohol and oil of lavender. The glass plate was then a negative, and could be used to make a wide variety of paper prints.

BRYAN CLARK GREEN

See also: Daguerreotype; and Calotype and Talbotype.

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WET COLLODION POSITIVE PROCESSES

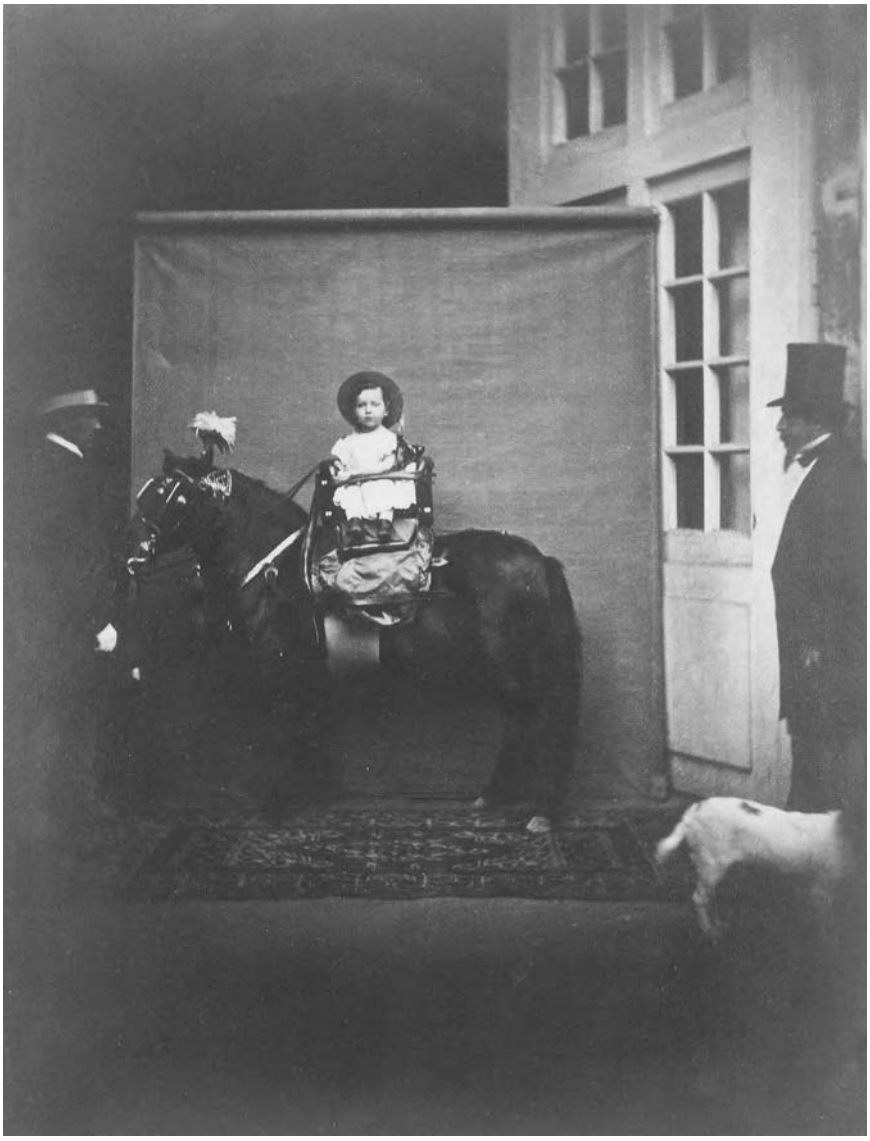
(Ambrotype, Pannotype, Relievotypes)

The latest fashion in photographic portraiture, the wet collodion positive process on glass (also known in the United States as the ambrotype), was introduced in 1854. The images had a warm tone and did not have the mirror-like reflection that made daguerreotypes difficult to view. The images were the same standard sizes as daguerreotypes, and in Western countries and colonies they were usually presented in a similar manner, with hinged cases, and a glittering brass mat. "The closed, hinged case introduced the element of surprise, a sense of drama as one held it in one's hands, wondering what was going to be pictured inside. As the case was opened this sense of theater became part of the viewing experience."

The wet collodion positive process was derived from the collodion negative process described by English Frederick Scott Archer in1851. In the second edition of his manual (1854), Archer included a chapter, "The Whitening of Collodion Pictures as Positives." In the United States, the ambrotype process was patented by James Ambrose Cutting in 1854. Cutting's patents were largely ignored and had little effect in the rapid spread of this process across the United States.

The investment on the part of photographers to adapt their equipment and studios to the wet collodion positive process was inconsequential. The glass plates were the same standard size as the daguerreotypes; cameras were easily adapted to accommodate the glass plate and the investment in supplies and equipment was minimal. The chemicals required in preparing the collodion emulsion, and assorted paraphernalia including trays, beakers and funnels were readily available in cities and port towns.

The preparation and exposure of a wet collodion positive was a well choreographed dance that required timing and confidence in handling chemicals. The photographer prepared a collodion emulsion by dissolving gun cotton,



Pierson, Pierre Louis. Napoleon III and the Prince Imperial.
The J. Paul Getty Museum, Los Angeles

and modifying its "glutinous" consistency so that it would remain viscous. A how-to-manual noted that "it is hardly necessary to caution the student when using Gun Cotton, as he is aware of its explosive nature; a single spark of fire in it might cause serious consequences." The collodion solution was then poured onto a glass plate and the trick was to evenly distribute the viscous solution on the plate surface allowing the collodion to "set" but not become completely dry. The photographer moved into a darkroom (or dark tent) to dip the plate in a silver solution, and load into a negative holder. After the plate was exposed, the photographer immediately returned to the darkroom to develop and fix the image before the collodion emulsion would dry and harden.

The ambrotype, like the daguerreotype, is a unique image. Photographers created a negative image (the darkest areas were transparent, and the lighter areas had a greater density of silver) by under exposing the plate in the camera or under developing it in the final processing. A dark background was necessary to transform the image from a negative to positive before it was presented in a case to the patron. A variety of backings provided dark tones that brought out the image details and create the positive image: velvet fabric, black paper or "japanned black" paint either painted on the back of the case or the glass base of the image. Some photographers used opaque surfaces including ruby red glass, and leather as the base surface to prepare a wet collodion image. The images on leather were known as pannotypes. A more sophisticated process used by some studios in large cities, was the relieveotype process invented in 185 by Thomas C. Lawrence. In order to make the portrait stand out, the photographer removed the background and only blackened the area of the figure. The plate was backed with glass and a white background, to provide a greater illusion of depth.

The wet collodion positives, generally produced on glass, were introduced as ambrotypes in American cities. Itinerant photographers learned the process and moved across the United States. It was still faster to travel to the California by following well established shipping paths from New Bedford and other eastern port towns. In the October 1856, Hawai'i daguerreotypist Hugo Stangenwald, advertised that "having recently returned from a visit to San Francisco, [he] takes pleasure in informing the public that he has introduced, and is now prepared to execute, those splendid and permanent pictures on glass, well known as the improved ambrotypes."

In the Pacific, Andrew Garrett (a naturalist) earned his living by collecting, natural history specimens for individual scholars and U.S. and European institutions. In 1863, while living in Hawai`i, he "began to perfect himself in the relatively new art of photography, in order to go prepared to record the vegetation, flora, fauna, and inhabitants of these remote regions… An associate in San Francisco S. Hubbard… sent him a supply of photographic materials… and offered to act as his agent in San Francisco." An associate in San Francisco S. Hubbard purchased photographic materials for Garrett. Hubbard sent five boxes of photographic materials, and in his letter he requested that "if you should ever take any views I wish you would send me some and I will pay you for them, I should like a few pictures of the distinguished natives of the South Seas." By 1864, Garrett was collection images and specimens in the Tahitian, Marquesan, and Samoan Islands. A colleague in Honolulu wrote: "…not a day passes… without my dreaming over your fortune and success. I have imagined that the missionaries might decide that your photographs were a useless article of furniture and discourage the natives from patronizing you, and then again I think I see you surrounded by a crowd of natives dancing and shouting with pictures." Although not attributed, it is likely that Garrett made a beautifully hand colored ambrotype portrait of a native Tahitian man posed with a coconut in his lap, and a coconut frond artistically placed in the background.

The ambrotype process entered Japan through economic and political paths across the Pacific Ocean from San Francisco to the port of Yokohama. John Thomas Gulick, son of an American missionary in Hawai`i, was at loose ends in the winter of 1862, when he decided to learn photography in San Francisco from "Mr. [Carlton] Watkins" while waiting to find transportation to Japan. After arriving in Japan, Gulick noted that on May 2, 1862, he took his first successful picture: "After dinner took my first portrait. It was an ambrotype of Mr. Louder. It was taken when the sun was behind the hill and is therefore lacking in contrast of shades." Gulick left Japan in 1863, and noted in his recollections that "under my teachings a Japanese learned to take photographs and … I passed my camera and photographic material to him; and he became one of the first to spread the knowledge of that kind of picture taking among his countrymen." In Japan, ambrotype portraits were housed in specially made wood boxes, with a wood mat. This soft, light colored *kiri* wood (paulowina) was also used to make boxes to store scrolls and other valued items. Ambrotype portraits were common even after paper prints were available in Japanese studios, indicating the popularity of this style for family portraiture. The Meji period, beginning in 1868, was the height of the ambrotype process in Japan, although portraits continued to be made in rural areas until 1888.

Wet collodion positives were a transition process between daguerreotypes and paper prints. It was seldom used in the Western countries for portraiture after 1862, when paper prints made from wet collodion negatives became the latest fashion, and patrons collected carte-de-visite portraits to include in photographic albums. In addition, the U.S. Civil War (1861–1865) also contributed to a shift from wet collodion positives on glass to more durable carte-de-visite and the wet collodion image popularly known as the "tintype" (melainotype or ferrotype).

Lynn Ann Davis

See also: Archer, Frederick Scott; Daguerreotype; and Cartes-de-Visite.

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WEY, FRANCIS (1812–1882)

French writer and critic

Francis Wey arrived in Paris from his native Franche-Comté in 1830 to prepare for a life of business at the Ecole des Arts et Manufactures. In 1832 he left his studies to become a writer. He began penning essays on Romantic topics such as the Abbey of Noirmoutiers, for journals such as *L'Artiste*. In the long career that followed, Wey covered almost every mode of writing available to an ambitious Parisian in the nineteenth century.

Around 1833, Wey came under the protection of Charles Nodier, fellow Franc-Comtois and friend of the Wey family. Nodier introduced Wey into the literary circle which gathered around him at the Bibliothèque de l'Arsenal; there the young writer encountered most of the major and lesser lights of the Parisian literary scene. In 1834, perhaps on the recommendation of Nodier, Wey entered the Ecole Royale des Chartes. Thereafter his writing was facilitated (and often generated) by his secure career as an archivist. He published novels, tales, and travel narratives, but also erudite studies of the French language, articles on history and archaeology, and literary and art criticism.

In 1851 Wey wrote often for the new photographic journal *La Lumière*. His involvement with the magazine ended with its dissolution and reformulation at the end of the year. In 1853 he wrote an essay on the history of photography for *Le Musée des familles*; he did not write about photography again. Wey's attention to the medium lasted little more than a year, and went unremarked by his biographers and bibliographers. Yet his twenty-three articles on various photographic matters constitute an early and self-conscious formulation of the terms for photographic criticism. His suggestions for photographic subjects and projects were taken seriously by his peers. And his critical project was inflected by his devotion to Realist and Naturalist painting, and his friendship with Gustave Courbet, another Franc-Comtois. Their alliance was perhaps at its height in 1851, the year Courbet's portrait of Wey was hanging in the Salon along with *The Stonebreakers* and *A Burial at Ornans*, among other works.

Wey wrote technical, scientific and historical articles for *La Lumière*, but the themes of his photographic criticism emerge in his reviews and his writing about art. Above all Wey wanted to elucidate photography's relationship to painting and printmaking, and to identify subjects and genres for which photography was well-suited. The clearest statement of his ideas appears in one of his last articles, "Photographes et Lithographes" (*Photographers and Lithographers*), which appeared on 19 September:

Art has already exercised a very notable influence on photography. It has taught it the science of effects, the manner of composing a picture, and diverse procedures for elevating itself, in its literal interpretation of nature, to the impression that results from the sentiment for color.

Wey was sympathetic to photography that took its cues from painting by the *coloristes*—whether the recent flowering of landscape, which he saw as one of the most important artistic developments of the day, or portraits by old masters such as van Dyck and Titian, who achieved pictorial unity through atmosphere and judicious use of highlights. In a 17 August review of photographic publications Wey praised the lines in calotype photography, "which leave the leading role to effect and the modeling of planes." So photography offered proof of color's dominance over line. But although photography was to follow painting's paradigm, it was only in order to establish one of its own. Further into "Photographes et Lithographes" Wey enumerates subjects for which photography is the superior medium to painting, engraving, or lithography: "Subjects swarming with details, monuments loaded with arabesques, the crossroads of old neighborhoods, birds-eye views of the great cities put [photography] above all rivalry." What is more, Wey finds photography capable of effects that would in turn nourish painting:

> We have watched landscapists in admiration before prints taken in winter forests, prints whose planes had been formed from a prodigious tangle of bare brambles, boughs, tree trunks, bristling patches of grass, and small branches. We have watched painters contemplate, amazed, certain effects that were reputed almost unattainable, yet which were rendered by photography with a clarity, a simplicity of means which art had not imagined.

Wey had introduced some of these ideas in his first article for *La Lumière*, "Sur l'influence de l'héliographie sur les beaux-arts" [On the Influence of Photography on the Fine Arts], and he developed them in other essays—"Du naturalisme dans l'art: de son principe et de ses conséquences" (On Naturalism in Art: Its Principle and Its Consequences), "Théorie du portrait" (Theory of the Portrait), "Album de la Société héliographique" (Album of the Heliographic Society). He repeatedly claimed that photography would "renew" painting through the fresh relationships it recorded in studies of landscape, the nude, and drapery. He also somewhat teasingly used

photography to establish grounds on which to appreciate Realist and Naturalist painting.

It is tempting to speculate about Courbet's influence on Wey's writing for *La Lumière*. In two novels, *Biez de Serine* (1850) and *Le Bouquet de cerises* [The Bouquet of Cherries] Wey had written descriptions of stonebreakers which are probably based on Courbet's painting. If his novels of that moment are an effort to work through the fresh example set by the painter, his defense of new painting often seems coached by Courbet. In *Du naturalism dans l'art* Wey writes about the exhaustion of the academic tradition, and he asserts that subject matter and canvas size no longer hold the importance they once did. Here and elsewhere he claims that the excesses of the Romantics and the coloristes were launched in reaction to the impoverishment of the classical school, with the dogmatism of Realism and Naturalism forming another reaction in turn. And photography? The new medium would introduce a necessary control on Realist and Naturalist tendencies, allowing the proper return of imagination to painting.

Wey also directed his criticism toward practical developments. In addition to the subjects listed above, he advocated photography as the best means to reproduce works of art, especially sculptures and bas-reliefs. In some cases he also thought it was superior to lithography for the reproduction of paintings. In "Un voyage héliographique à faire" [A Heliographic Voyage to Make], he extolled the painting of the little-known Flemish primitives, especially Memling and van Eyck. He wanted this art to receive more critical attention, and he also felt that the paintings' crisp linearity lent them to photographic reproduction. Louis-Desiré Blanquart-Evrard paid attention, and works by the early Flemish painters soon appeared in his albums. Wey often addressed Blanquart-Evrard in his writing, egging the publisher to finish his first album, which was late in appearing and which the writer needed for a critical touchstone, and subsequently offering tough assessments of individual photographs and categories of subject matter. Finally, Wey passionately promoted photographic journeys to record the sites and monuments of France and the world. He also advocated official patronage of such trips: he wrote a long review of Maxime Du Camp's Nile photographs made under the auspices of the Ministry of Public Instruction, and in several articles he praised the Mission Héliographique, still underway when his relationship with *La Lumière* ended.

PETER BARBERIE

Biography

Francis Alphonse Wey was born in Besançon in 1812, into a commercial family of German origin. The Wey family had suffered significant losses during the Revolution and Terror, but maintained its business in Indian trade. In 1830, the eighteen-year-old Wey was sent to Paris to enter the Ecole des Arts et Manufactures. In 1832 he abandoned his studies against his family's wishes and turned to writing. In 1834 he entered the Ecole Royale des Chartes, graduating to become an archivist and paleographer at the National Archives in 1837. In 1853 he was named Inspector General of Departmental Archives, a post that he held until 1879.

Wey was a prodigious writer. Beginning in the 1830s he authored more than twenty novels and short stories, as well as two theatrical comedies. He also wrote over a dozen pieces of travel literature, which divide into distinct categories of light reportage and rather serious historical and archaeological accounts. Much of his writing appeared in popular journals such as *Musée des Familles* and *Revue de Paris*. In 1858, his biographer Eugène de Mirecourt characterized Wey as "the Christopher Columbus" of the *roman-feuilleton*: his skill with cliffhangers for his serialized novel *Les Enfants du Marquis de Ganges* [The Children of the Marquis of Ganges], published in 1838 in *La Presse*, had inspired dozens of imitators.

Wey also wrote reviews and philological and historiographical articles for learned societies. In his lifetime he was most honored for his studies of the French language, especially *Remarques sur la langue française, sur le style et la composition* [Remarks on the French Language, on Style and Composition; 1845] and *Histoire des révolutions du langage en France* (History of Revolutions of Language in France; 1848). In 1846 he was made a Chevalier of the Legion of Honor in recognition for the former work. Other books that were especially esteemed include *Le Bouquet de cerises* (1852) and his long travel book *Rome, descriptions et souvenirs* [Rome, Descriptions and Memories; 1871–1875].

Although Wey supported the politicized new painting of the 1850s, and even took up Courbet's subject of stonebreakers, he was himself a moderate Republican. He published two books related to the political upheavals of his period, *Manuel des droits et des devoirs, dictionnaire démocratique* [Manual of Rights and Responsibilities, Democratic Dictionary; 1848], and *Chronique du siége de Paris* [Chronical of the Siege of Paris; 1871].

In 1839 Wey joined the Société des Gens de Lettres, founded the previous year. He was the society's president from 1852–1854, 1857–1858, and again from 1861–1863. In 1864 he was made honorary president.

In 1858 Wey became a member of the Comité des travaux historiques, a national commission parallel to the Commission des monuments historiques, but dependant from the Ministry of Public Instruction. Like the Commission, the Committee had concerned itself with photography of monuments since 1849.

Francis Wey died in Paris in 1882.

See also: *La Lumière*; Courbet, Gustave; Blanquart-Evrard, Louis-Désiré; Du Camp, Maxime; and Mission Héliographique.

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WHATMAN, JAMES & CO.

The *Whatman's Turkey Mill* watermark, which appears on many calotypes taken by Henry Fox Talbot and by Hill and Adamson, and on cyanotypes by Anna Atkins, dentifies a paper that was produced by a long-established manufacturer in Maidstone, Kent, England.

Turkey Mill, originally a fulling mill in which woollen fleeces were washed before spinning, was built in the 17th century, and was converted into a paper mill in the 1730s by Richard Harris.

On Harris's death, James Whatman, a tanner, married Ann in August 1740, just a few years after Harris had completed the mill conversion, and James and Ann determined to make their paper mill the finest in the country. At that time most of the finest papers for artists were imported into Great Britain from France and the Whatmans sought to change that.

James Whatman died in 1759, and his son, also James, took over the mill in 1763 aged only 21. In the following years, James introduced many innovations in paper-making—including discoveries which lead to improved whiteness in the papers—and built what he called his 'contrivance' to make paper which he named 'antiquarian size'—more than 50 inches by 30 inches—the paper-making process requiring a team of eleven men to operate it.

In the 1770s, James Jr. and his second wife took in William Balston, and Balston became his protégé and was groomed to become his successor. A stroke caused James to pass the operation of his mills—three by that time—to Balston, then 31, in 1890, and Balston remained with the business after it was sold to local businessmen in 1794.

In 1805 Balston left to form his own business, building a new mill at Springfield, and became the first to employ steam rather than water to power the processes of paper-making.

The Whatman name remained with the original company, and became enormously popular with artists of the day—amongst them J. W. M. Turner, for whom Whatman paper was a preferred choice claiming it gave particular qualities to his watercolours.

After 1840 Whatman's Turkey Mill paper also became the first choice of material for many pioneer British photographers, and the dated Whatman watermark can be seen in a few negatives produced by early calotypists, including Talbot, Hill & Adamson, Reverend George Wilson Bridges, Calvert Richard Jones, John Dillwyn Llewelyn and others.

Despite its popularity, however, Whatman's Turkey Mill paper was not ideally suited to photography. For a start there was the distinctive watermark, which intruded sometimes aggressively, into the composition. In the early days, this does not seem to have been seen as a serious problem, but later calotypes were made on paper specially cut from larger sheets to avoid it. The sheets bearing watermarks were retained for printing, where the watermark did not present such a problem. The paper had other drawbacks for photography as well—being largely made from rags, it was not uncommon for it to contain invisible traces of metal from buttons etc which had been introduced during the manufacturing process. While irrelevant in a writing paper, the chemical processes through which the calotype paper was passed caused those metal fragments to corrode and stain.

In 1857, an article in *The Liverpool and Manchester Photographic Journal* (vol. 1, 214) recounts a visit to see paper being made at "Hollingsworth's, formerly Whatman's Turkey Mill" and offers singular praise for the product stating that "the best paper ever made for the Talbotype process was made at Turkey Mill" and that "This paper was successfully used by the Rev. Calvert Jones, about 1844, at Malta, in very hot weather, and also in the East by the Rev. Mr. Bridges. It is strange to relate that such paper has *never* been obtained since, even from the same mill, and that is why I dwell so much upon it at this moment. Could we get such a paper again, with certainty the Talbotype would take a new start." Written at a time when the wet collodion process was in its ascendancy, that is quite a statement!

After a series of mergers—starting with Houldsworth and Balston in the early 1850s—the Whatman name was revived in the 20th century, and the company continues

papermaking today, and is one of the largest employers in Maidstone.

JOHN HANNAVY

See also: Atkins, Anna; Bridges, George Wilson; Hill; David Octavius, and Robert Adamson; Jones, Calvert Richard, Llewelyn, John Dillwynl; and Talbot, William Henry Fox.

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WHEATSTONE, CHARLES (1802–1875)

English physicist and inventor

Sir Charles Wheatstone was born in Gloucester on 6 February 1802, the son of W. Wheatstone, a music seller. He attended a local private school, where he early manifested an interest in mathematics and physics. At the age of 21, he and his brother established a musical instrument-making business in London, a trade that allowed him to pursue his experiments with devices to measure and record sound. Wheatstone's first scientific paper, entitled "New Experiments on Sound," appeared in 1823, and his acoustical research continued with his invention of the concertina and a small form of accordion. In 1828 he presented the kaleidophone, a philosophical instrument that demonstrates the regularity of acoustic patterns by visual means. Although not intended to be a marketable device, the kaleidophone had utilitarian heirs in the photometer and the phenakistiscope, which likewise depend on the persistence of vision.

Wheatstone was part of a new generation of "natural philosophers" who believed in the value of practical research. For him, the construction of a functional device was both a means of working out an idea and an end in itself—a method that would prove central to the emerging discipline of physics. In 1834, still listed as a "musical instrument maker," he was appointed professor of experimental physics at King's College, London. He was only 32 years old. Hampered by acute shyness, Wheatstone seldom lectured after his first year in the post, instead using the institutional resources provided by his professorship to continue his research. Yet he was not socially or intellectually isolated. His publications in various scientific journals earned him immense respect (and election to the Royal Society in 1836); and he maintained close friendships with colleagues such as Michael Faraday and Sir John Herschel, and with artists including John Martin and George Cruickshank. Martin's son recalled that Wheatstone's home at 19, Park Crescent was "one of the most scientific and the most charming in the metropolis, and the resort of all distinguished in art, science or literature."

Wheatstone's importance for photographic history lies in his invention of the stereoscope. He apparently constructed prototypes as early as 1831, and presented it formally to the Royal Society in 1838. The stereoscope illustrated Wheatstone's revolutionary idea that the perception of solidity depends on the mental combination of the different images seen by the two eyes—the principle of binocular vision. The device itself is a symmetrical arrangement of mirrors (hence its common designation as a "reflecting stereoscope") and easels. In the center of a platform, two upright mirrors are placed at a 90° angle to one another, with two upright easels (to which images are affixed) placed at equal distances from the mirrors. The viewer places the eyes close to the vertical axis, where the mirrors are fixed together; looking at reflections of two flat pictures in the mirrors, one perceives a single, three-dimensional image about 6 to 8 inches away from the face. Wheatstone initially used pairs of simple line drawings—free of artistic conventions for indicating three-dimensionality—and predicted that more complex images might be introduced to even greater effect. The nearly simultaneous invention of photography immediately suggested itself as the ideal means of achieving such images.

The fact that Wheatstone did not comment on his own use of photography until 1852 has resulted in some confusion about the date and maker of the first stereoscopic photographs. Wheatstone's correspondence with William Henry Fox Talbot proves that the latter did make some experimental calotypes for use in the reflecting stereoscope by December 1840. During this initial period of trial and error, before the development of stereo cameras, successive exposures were made from slightly different positions with a single camera to produce a stereo pair. Wheatstone explained to Talbot that his photographs differed by too great an angle; he also pointed out that the two pictures must be taken under conditions when shadows would fall in exactly the same way in each. Experiments resumed in August 1841, when Henry Collen, under Wheatstone's direction, produced calotype portrait and still-life pairs. Earlier in the year, in the spring or summer, Wheatstone had gone with John Frederick Goddard to Richard Beard's

newly opened daguerreotype studio, where he had a pair of daguerreotype portraits of Beard's son taken to his specifications, and in 1842 Wheatstone commissioned Antoine-François-Jean Claudet in London and Louis Armand Hippolyte Fizeau in Paris to produce stereo daguerreotype pairs. However, he did not publicize any of these experiments.

By this time Sir David Brewster had devised an alternative stereoscope, somewhat similar to opera glasses in construction and employing lenses instead of mirrors. Brewster's highly marketable refracting stereoscope essentially determined the design parameters of stereo cameras and the standardized format of stereograph cards. Wheatstone had little involvement in the question of stereophotography once it became commercialized. In 1858 Brewster drew him into a dispute about the originality of the stereoscope, which the two scientists argued in letters to the *Times*. As this was not a patent dispute, no money was at stake; and the general consensus among commentators was that Wheatstone had proposed the theory and invented a device to prove it, while Brewster had refined the device so as to transform it from a philosophical toy into a viable commodity.

Wheatstone did not, in any case, need to earn money from the stereoscope. He had invested wisely in the Hammersmith Bridge Company and in various British and American mining concerns. Most significantly, he had taken care to patent (with William Cooke; 1860–1879) various improvements to the electric telegraph, the technology for which he is best known today. He carried out experiments with submarine telegraphy at Swansea Bay, in 1844, with photographic pioneer John Dillwyn Llewellyn. Other achievements include the Wheatstone Bridge (1843), which accurately measures electrical resistance; and the Playfair cipher, a cryptographic method based on digraph substitution.

Wheatstone married Emma West on 12 February 1847, and the couple had five children. He was named a chevalier of the French Legion of Honor in 1855 and became a foreign associate of the Academy of Sciences in 1873. He was knighted on 30 January 1868, and throughout his career earned some thirty-four honorary diplomas from a variety of institutions, including Oxford and Cambridge. Wheatstone died in Paris on 19 October 1875, leaving his collection of books and instruments to King's College.

Britt Salvesen

Biography

Charles Wheatstone was born on 6 February 1802, the son of a Gloucester music seller. He entered the musical instrument-making trade in London, but early made a name for himself in scientific circles by publishing his experiments on sound. In 1834, at age 34, he was appointed professor of experimental physics at King's College, London, where he conducted research on acoustics, optics, and electricity. He made an important contribution to photographic history with his invention, announced in 1838, of the reflecting stereoscope. In the early 1840s, Wheatstone called on various pioneers of photography to produce experimental pairs of calotypes and daguerreotypes produced for the stereoscope. Other technological innovations with which Wheatstone is associated include telegraphy, electric chronography, and cryptography. He was elected to the Royal Society in 1836 and knighted in 1868. He died in Paris on 19 October 1875.

See also: History: 2. 1826–1839; Philosophical Instruments; and Stereoscopy.

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WHEELHOUSE, CLAUDIUS GALEN (1826–1909)

As a recently qualified doctor, Wheelhouse was the medical attendant on a cruise yacht in the Mediterranean in the late 1840s, and used the opportunity to produce one of photography's earliest travelogues, entitled *Photographic Sketches from the Shores of the Mediterranean*. One of the guests on board was Lord Lincoln, later the Duke of Newcastle and Minister of War at the time of the Crimean War.

In the three years in which he pursued photography as a hobby, he travelled to Greece, Egypt, Malta, and Spain, producing some of the earliest photographs of Thebes, and fine images of Cairo, Athens, and Seville. Using the calotype process, he photographed the greatest sites of Egypt, at the same time as, or even before, the better-known pioneers of early photography in the region.

The demands of calotype photography as a hobby soon outstripped the time available to the young doctor, who was destined to carve out a significant career for himself in surgery. He studied medicine at Leeds medical School in the 1840s, where he and his fellow students are reported to have experimented on each other to assess the anaesthetic effects of ether. He advocated the use of Lister's carbolic spray as an antiseptic and presented a major paper on surgery to the British Medical Association in Bath in 1878

Wheelhouse gave all his negatives to Lord Lincoln, and they were reportedly destroyed during a fire at Lincoln's house in 1879.

JOHN HANNAVY

WHIPPLE, JOHN ADAMS (1822–1891)

American photographer and inventor

Whipple was born in Grafton, Massachusetts, on 10 September 1822. As a boy he became interested in chemistry and attempted to reproduce the newly discovered invention of daguerreotypy. He came to Boston in 1840 and began manufacturing chemicals for daguerrean artists. When the fumes later caused him to abandon this practice he turned to the making of pictures although as his numerous inventions show, he always maintained an interest in improving the photographic process.

Whipple entered into partnership with Albert Litch in 1845, and they opened a studio at 96 Washington Street, a center of picture-making activity and industry in Boston. Litch left in 1847, and Whipple continued under his own name at the same address. Between 1856 and 1859 he partnered with James Wallace Black; the quality of work produced by their studio rivaled that of the well-known firm of Southworth & Hawes. Whipple's studio was located on the top floor so that he could take advantage of the natural light. Display cases at street level alerted passers by to the studio's presence. One of its special features was a "Miniature Steam Engine" that powered the buffing wheels used in preparing the plates and operated the revolving sign in the form of a sun that Whipple used to entice visitors. His portrait clientele included the highest of Boston society (he made a group of daguerreotype portraits of the Harvard class of 1852, the first class to be photographed, and continued to do so through 1860). Whipple was known for the psychological content of his portraits, for his ability to put clients at ease by telling little stories, and for his skill in arranging sitters.

Whipple was a pioneer in the field of astronomical photography. In the late 1840s and 1850s he collaborated with Professor William Cranch Bond and his son George Phillips Bond at the Harvard College Observatory. The first successful representation of the moon was taken on March 14, 1851, by mounting the daguerreotype plate in the focus mechanism of the Great Refractor, one of the largest telescopes in the world at the time. Made by synchronizing the exposures with the pauses between the movements of the clockwork mechanism, the resulting image had an exposure time of thirteen seconds and measured three inches in diameter. A daguerreotype enlargement of the view exhibited at the Crystal Palace in London in 1851 awed audiences with the incredible details of the lunar surface and won a medal for excellence of production, "indicating the commencement of a new era in astronomical representation." Whipple and his partners, first William B. Jones and then Black, made about seventy exposures of different subjects, including the planet Jupiter. Whipple and Black worked again with the Harvard Observatory in 1857 producing over two hundred photographs of stars using the collodion wet plate process.

Whipple contributed many inventions that advanced the cause of photography. In 1846 he began experimenting with slides of microscopic insects and specimens, which a contemporary observer described as "the most delicate tissue of the tiniest animal." In 1849 he patented the crayon daguerreotype portrait, a technique he developed to create an effect of softness around the sitter as if the figure was floating in space. He achieved this by posing his subject against a light background and then placing in front of the lens a card with an aperture, which he moved in a circular motion during exposure so as to avoid any hard-edged lines.

Whipple's biggest contribution was the crystalotype process, which debuted in 1850. In 1844 Whipple, building on the experiments of early photographic pioneers, began exploring the possibilities of making paper photographs from glass plate negatives. On June 25, 1850, he and Jones patented the crystalotype process in which light sensitive materials were suspended in a mixture of egg white and honey, poured onto a glass plate, and exposed. In 1852 a writer for the *Photographic Art Journal* noted that the crystalotype presented "all the beauty of an actual painting with the unerring accuracy of the daguerreotype likeness." Indeed, the name crystalotype comes from the crystal clear transparency of the glass negatives.

Because of the long exposures, the crystalotype was first used for copying daguerreotypes. The process's reproductive capabilities enabled Whipple to produce prints for use in periodicals and book publications. His crystalotypes were mounted as frontispieces in the 1853 and 1854 issues of *The Photographic Art Journal* and the publication *Homes of American Statesmen* (New York, 1854), which has been described by one scholar as the first photographically illustrated book published in the United States. In 1852 examples of Whipple's process were on view at Root's Gallery of Daguerrean Art in

New York, and in 1853 his crystalotypes of the moon were awarded a silver medal at the Crystal Palace exhibition in New York. Whipple was generous in encouraging the use of the crystalotype and sold the rights to the process for $50; training was also provided for $50. The photographer Josiah Johnson Hawes and William James Stillman, a landscape painter, are said to have learned from Black, who was the principal instructor.

For unknown reasons Whipple and Black dissolved their partnership in 1859. Whipple kept the studio at 96 Washington Street and in 1865 moved to 297 Washington Street, establishing himself in rooms in three buildings with every modern convenience, including the largest skylight in the country according to one visitor. During this period he created a group portrait of the National Congregational Church Council at Plymouth Rock, a contact print measuring approximately 15 × 19 inches and containing over 1,000 figures. Whipple later photographed the aftermath of the Great Boston Fire of 1872.

Whipple retired from photography on June 1, 1874, after a family problem forced him into debt. Until his death from pneumonia on April 10, 1891, he was a bookseller and publisher of religious books. Whipple's photographs can be found in the following collections: Boston Athenaeum, Boston Public Library, Massachusetts Historical Society, Society for the Preservation of New England Antiquities, Harvard Observatory, International Museum of Photography, George Eastman House.

MICHELLE LAMUNIERE

Biography

Whipple was born on 10 September 1822 in Grafton, Massachusetts. Interested in chemistry as a boy, after moving to Boston in 1840 he began producing chemicals for daguerreotypists before beginning to take photographs himself. Whipple was instrumental in the development of the glass negative/paper positive process in America. He became known for his portraits, as well as views of the moon, buildings and ceremonial events in Boston. Whipple was married to a Boston-born woman named Elizabeth who bore a son William in 1861. By the time of his death, he had five children. Whipple exhibited frequently at exhibitions held by the Massachusetts Charitable Mechanic Association beginning in 1841 through the late 1860s, often receiving awards, and assisted in the formation of the National Photographic Association in 1868. After retiring from photography in 1874 he became a bookseller and publisher of religious books. Whipple died in Boston on 10 April 1891.

See also: Black, James Wallace; and Southworth, Albert Sands, and Josiah Johnson Hawes.

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WHITE, CLARENCE HUDSON (1871–1925)

American photographer

Born in Ohio, Clarence White was renowned both as a pictorialist photographer and as an inspirational teacher of photography. He is best known for his soft-focus photographs, often depicting women and children in domestic or natural settings.

After leaving school, White worked a book-keeper for a wholesale grocery business, taking up photography as a hobby in about 1893. Self-taught, he was a founder member of the Newark Camera Club in 1898. He met prominent figures in the photographic world, such as Fred Holland Day, who became a lifelong friend, and his work began to be shown at national and international exhibitions. He became a member of the Linked Ring in 1900 and was also a founding member of the Photo-Secession, having his work reproduced in *Camera Work* in 1905.

Increasingly involved in photography, he decided to give up his job and support his family through commercial photography and teaching. In 1906 he opened a studio on Fifth Avenue, New York and from 1907 until his death he lectured on photography at Columbia University Teachers College. In 1914 he founded the Clarence White School of Photography in New York, and his students included Dorothea Lange, Margaret Bourke White and Paul Outerbridge. He died suddenly, from a heart attack, in 1925, during a trip to Mexico with a group of students.

COLIN HARDING

WHITE, HENRY (1819–1903)

Henry White was born in 1819, the son of Richard Samuel White. He became a lawyer and went into practice with his father as White and Son. He took up photography and began exhibiting albumen prints

made from wet collodion negatives in 1855, and he showed his photographs at the various photographic societies in England and Scotland as well as the 1857 Manchester Art Treasures Exhibition and the 1862 International Exhibition. He also exhibited at the 1855 Paris Exposition Universelle and the 1856 Brussels international photography exhibition. A member of the Photographic Society, he served as its treasurer. In the late 1850s, his subject matter consisted of rural scenes, rivers and streams, fields of crops, and close-up views of vegetation, often in Surrey. He also exhibited some photographs of sculpture. In the early 1860s, his subjects included Welsh landscapes. His best-known photographs include "Hunford Mill";, " Surrey"; "The Lledr Bridge, near Bettws y Coed"; and "The Cornfield." His work is found at the Victoria & Albert Museum, the Metropolitan Museum of Art, and the Getty Museum, among others. He died in 1903.

Diane Waggoner

WHITE, JOHN CLAUDE (1853–1918)

John Claude White, Companion of the Indian Empire (CIE), was born on 1 October 1853 in Calcutta, the son of a British doctor in the Government of India. Educated at the Royal Indian Engineering College, Cooper's Hill, England, he entered the Government of India as a civil engineer; photography was his vocation. In 1883 he was assigned for a year to the British Residency in Kathmandu, Nepal, where he photographed Nepal's architecture and monuments. Named political officer in 1889, he moved to Gangtok, Sikkim where he oversaw British interests in Sikkim, Bhutan and Tibet for nearly 20 years. He carried his camera everywhere, photographing the Himalayan mountains, architecture and people. A member of the 1904 British invasion of Tibet, he was the only expedition member permitted to photograph Lhasa's monasteries. He made five trips to Bhutan, photographing its architecture and the 1907 coronation of its first king. His landscapes, glaciers, and architectural studies form a remarkably comprehensive documentation of important events in the history of the political development of the North-East Himalayan Frontier. His photographs were published by the studio Johnston and Hoffman: *Sikkim* (1902), *Bhutan* (1905–06), and *Tibet and Lhasa* (1908). His writings, including his memoirs *Sikhim and Bhutan: Twenty-one Years on the North-East Frontier 1887–1908 (*London: Edward Arnold, 1909) and three articles in *National Geographic Magazine* illustrated by his photographs opened the window on the Himalayan region to the west. *In the Shadow of the Himalayas: Tibet-Bhutan-Nepal-Sikkim, a photographic record by John Claude White 1883–1908* (Mapin, 2005) contains over 100 of his photos, including his best known image, a panorama of 1904 Lhasa. He died in London on 19 February 1918.

Pamela Deuel Meyer

WHITE, JOHN FORBES (1831–1904)

English photographer

A miller, art collector, and amateur photographer, John Forbes White was born in Aberdeen, the son of a flour miller, and was educated at Marischal College in the city, where he first met Thomas Keith with whom he would take many of his photographs in the 1850s. Between 1854 and 1858, the two men travelled extensively together with their cameras. They married sisters, Ina and Elizabeth Johnston, the cousins of Sir James Young Simpson.

Like Keith, from whom he had learned photography, White used Le Gray's waxed paper process for all his known output, and his subjects ranged from local views around Aberdeen and the Balgownie estate near the family's flour mills, to views in Central Scotland, Northern England, and North Wales. By the time of his interest in photography, he was running the family business, and it was the pressure of that responsibility which prompted him to abandon photography in 1859, the year of his marriage.

His photographic output consists of little more than eighty large paper negatives, many of them never printed until very shortly before his death.

White's work remained unseen for over forty years until James Craig Annan printed several of his negatives and displayed them to critical acclaim at the Glasgow International Exhibition of 1901 alongside images by Thomas Keith, and by Hill and Adamson.

John Hannavy

WHITE, MARGARET MATILDA (1868 –1910)

Margaret Matilda White (1868–1910) emigrated to New Zealand from Belfast with her family in 1886. She was a friend of John Robert Hanna, a skilled Irish photographer who conducted a very successful portrait business in Auckland. It is thought that this friendship resulted in her acquiring skills as a photographer, which she demonstrated while working as a ward sister in a Mental institution. Her job provided her with subject matter that was very challenging because of the psychological undertones that the images invoke. She later married and moved to the West Coast of the South Island where she continued to use her camera to record her life and times. Because of her premature death in 1910, there isn¹t what one would call a very extensive files of negatives to draw upon

for an assessment of her abilities with a camera. Those that have been preserved are housed in the Auckland Institute and Museum. A study of these proves that she was capable of a lighter mode, photographing her workmates and friends in risqué situations, drinking and smoking in the company of men! There is also a very historically important reportage series on the funeral of the important Maori Chief Rewi Maniapoto, including a *morte* study.

William Main

WILLÈME, FRANÇOIS (1830–1905)

Draughtsman, painter, and sculptor (he made models for the bronze manufacturers of art), François Willème also practiced photography. His various experiments gave him the idea of a new process, the photosculpture, which he developed beginning in 1859, and for which he registered several patents. The photosculpture consisted of producing a statue, a statuette, or a bust starting from a series of photographic negatives taken of a live person or a model in sculpture in the round. This involved a device that was comprised, as installed in a salon, of a circular platform ten meters in diameter, lit by a canopy; on the other side of the circular wall, in a corridor, were laid out 24 cameras (the lenses were concealed by carved busts), which made it possible to photograph the model at the same time from every angle possible (the shutters were connected and could be opened and closed at the same time). In the workshops, the negatives were then projected in a "lampascope" on a translucent screen, increased to the desired size; on the back of the screen, a workman traced the silhouette with a point fixed at a pantograph; at the other end, the pantograph was equipped with a knife which cut out the silhouette in a block of clay, poised on a revolving base; after each layout, the resulting image was projected and translated in the same way into three dimensions, and so on until the sum of the profiles was obtained. A sculptor completed molding and perfecting the image; the statue could then be cast. The resemblance was guaranteed, with proportions exact.

In 1861, François Moigno spoke about the process in his *Cosmos* review, but it was only in 1863 that the invention was made known to a larger audience. The Société générale de photosculpture was formed that year thanks to capital brought by different financiers; the first establishment opened on boulevard de l'Etoile, in a large building crowned with a cupola of glass, and with the facade decorated with statuettes; two years later, a branch opened on the boulevard des Italiens. To launch his company, Willème accepted the support of the press and writers. Willème's businesses were attended by the good company of the Second Empire, beginning with the imperial couple and its entourage, the personalities of the artistic and literary world, as well as society women. The vogue of photosculpture exceeded the French borders: similar establishments opened in London (Antoine Claudet introduced the process in England by proposing some improvements, and showed examples in 1864) and in the United States (branch opened in 1866 in New York by Huston and Kurtz). Willème went to Madrid to make the portraits of the royal family of Spain.

Willème showed specimens of photosculpture to the Société française de photographie in 1863 and 1864 (with his associate De Marnyac), and at the World Fair of Vienna in 1864, and to the exposition of the central Union of arts in Paris in 1865. Each time he had a great public success. The judgments of critics were divided. Ernest Lacan, always enthusiastic, compared a bust in terra-cotta with the "more charming oeuvres of the XVIIIe century" (*Monitor of Photography*, September 15, 1865), whereas Theodore Pelloquet spoke about "stiff figurines, gauche, of a soft design" and exclaimed: "All that is extremely ugly, all that feels mechanical and misses character and of life" (*Time*, August 13, 1865).

At the Exposition Universelle of 1867, Willème had a share of a house in the park. But the passion for photosculpture had already reached its end and the company collapsed; in 1868, Willème closed his workshops and returned to live in his native area of Sedan.

Even if it were transitory, the glory of Willème and his invention attests to the vogue of the photographic portrait under the Second Empire and of the inventiveness of the medium of photography; it also testifies to the entrepreneurship which could animate an even obscure artist, since he proposed a new idea and had effective support, in particular that of the press, which represented a true power then.

If it seems an invention without future, even like a salon entertainment for an avid society to contemplate its image, the photosculpture had at least the ambition to put sculpture, noble art, within the range of more modest purses; the duration of the sittings were short, the execution was fast and reduced the total cost. In that, it falls under the vast movement in favour of the industrial arts; but Willème undoubtedly failed insofar as there was never a true market for photosculpture, the victim of the competition of the more accessible photographic portrait, the format calling card. In addition to the portrait, Willème also made attempts at reproductions of old sculptures. The specimens of photosculpture now preserved are in plaster: portraits of personalities or unknown, adults and children (Rochester: collection Gabriel Cromer, SFP, Compiegne, Museum of decorative Arts, Museum of Arts and Trades).

Helene Bocard

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WILLIAMS, THOMAS, RICHARD (1825–1871)

British professional photographer

Thomas Richard Williams was a London-born professional photographer who was particularly known for the quality of his stereo-photography. Born in 1825, Williams was one of the few British photographers to make use of the daguerreotype process to produce news photographs. He specialised in making stereoscopic daguerreotype still-life studies and portraits. He also produced a large range of conventional stereocards from collodion negatives.

It is thought that Williams gained his professional experience by acting as assistant to pioneer daguerreotypists Richard Beard (1801–1885) and Antoine Claudet (1797–1867). Claudet was the first professional to use the stereo-daguerreotype in England and Williams was able to learn his trade from a skilled master and later go into direct competition with him.

Williams married Elizabeth in ca.1848–49 and went on to have nine children; his wife, three boys and three girls aged between five and twenty-one survived him at the time of Williams' death at his home, Sellar's Hall, in Finchley north London. Williams made a good living from his photography; as well as his large family there were several servants employed, including a coachman.

Williams' earliest photographic work seems to have been stereoscopic still lives produced by the daguerreotype and collodion processes. Many objects reappear in several of these elaborate set pieces. Musical instruments, stuffed animals, statuettes, fruit and vegetables, barrels, dead game, skulls and books all feature heavily, reflecting mid-Victorian taste.

A guitar, a table decoration within a glass dome and a Brewster pattern stereo-viewer all feature in one of his early tableaux, taken before his move to his Regent Street studio in the West End of London in around 1854. A small label on the reverse gives his early details: 'Mr. T.R. Williams, Photographic Artist, 35, West Sq. St. George's Rd. Lambeth.' At this time Lambeth was a poor area of London, an unfashionable district south of the River Thames.

If Williams was to make money from his photography he needed to move to a richer area of the capitol and Regent Street was the hub of fashionable photographers. Claudet was at number 107, Mayall (1810–1901), who also at one time assisted Claudet, was in the nearby Strand (and later in Regent Street) and W.E. Kilburn had a studio at number 234.Williams moved next door, to number 236 Regent Street.

At his portrait studio, which was patronised by royalty, aristocracy and the upper middle-classes, Williams also advertised views taken in and around the Crystal Palace (built originally in Hyde Park for the 1851 Great Exhibition and later moved to south London). He also offered a service to copy paintings, watercolors, crayon drawings, sculptures, and daguerreotypes.

Williams photographed Queen Victoria at the opening of the Crystal Palace Exhibition in June 1854 and again in 1855 when she was in the company of Napoleon III.

Williams went on to undertake several royal commissions including, in 1855, the launch of HMS Marlborough at Portsmouth and the return of servicemen from the Crimea. The following year he produced a few superb hand-colored stereo-daguerreotypes of the Queen's daughter, Princess Victoria, in her wedding dress.

Like Claudet Williams offered his stereo portraits with their own folding, leather viewing case, embossed with his name. He often subtly initialled his stereo-daguerreotypes 'T.R.W.' in pencil on the black paper surround, his earlier work was sometimes marked in the image itself.

Williams exhibited his commercial work at several London photographic exhibitions between 1855–1864. Stereo work was shown (from collodion negatives), along with a wide selection of carte de visite, and larger portraits.

Williams' reputation was largely built on the stereo-daguerreotypes and the wide selection of card- mounted stereos he produced at the Crystal Palace in 1854. Many of his views were distributed by the London Stereoscopic Company, as well as other publishers.

By Christmas 1856, a series of around sixty views (plus a few variations) entitled 'Scenes in Our Village' were available. This series showed life in a typical rural village in the English countryside and were accompanied by lines of poetic verse, probably penned by Williams himself.

Research by Brian May has shown the village photographed by Williams was Hinton Waldrist, just south of Oxford and about forty miles from London. May has also shown that Williams was, unusually, taking at least two pairs of negatives of the same posed rustic scenes, either using a single camera with two lenses mounted above each other, then moving the camera to one side and making another exposure, or by using two

identical cameras set up around six inches apart. There is evidence that this arrangement was used earlier, at the Crystal Palace in 1854, whether or not by Williams himself is unclear. The main reason was to produce two pairs of negatives of the same scene. William's strange arrangement made some sense; it allowed him to make two negatives, in case one became spoilt in processing or broken, also, it would also be possible to provide two different publishers with a negative each for printing. May argues that Williams found the 'sequential' effect of one image varying slightly from the other improved the three dimensional stereo effect.

Of course Williams might have used this unusual arrangement before; to produce both a glass stereo negative and a daguerreotype at the same time, in fact Williams is probably unique in offering photographs on metal and card of the same scene. This method of working was not necessary with still-lives or scenes with no figures, as Williams would have plenty of time to expose two or more plates. However, with the posed 'Village' scenes it was paramount to make the exposures quickly. The 'Village' series were taken with collodion on glass and there are a few known as glass positive transparencies, as well as conventional card-mounted examples.

Following this series of stereo views Williams concentrated on portraiture at his Regent Street studio, producing good quality cartes-de-visite and larger portraits. By the end of his career he was being assisted by his son Alfred, who was 18 at the time of his father's death in 1871.Williams was at one time in partnership with William Mayland, who appears to have taken over the Regent Street studio on Williams' death. Mayland went on to produce good-quality seascapes in carbon, in the style of Col. Stuart Wortley (1832–1890).

Williams died aged 46 on April 5, 1871 at his north London home from the effects of diabetes, which was at that time untreatable.

IAN SUMNER

Biography

T.R. Williams was a London commercial photographer mainly known for his stereographic work, often in the style of his mentor Claudet. He made an extensive series of photographs of the Crystal Palace exhibition of 1854, patronised by Queen Victoria. Williams produced 'news' photographs of the exhibition's opening ceremony and operated a successful studio and photographed many well-known personalities.

See also: Cartes-de-Visite; Stereoscopy; Daguerreotype; Wet Collodion Negative; Beard, Richard; Claudet, Antoine-François-Jean; Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); Victoria, Queen and Albert, Prince Consort; and London Stereoscopic Company.

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WILLIS, WILLIAM (1841–1923)
British inventor

His name is synonymous with the invention of platinotype—the finest process in the entire repertoire of 19th century photographic printing. Born in 1841 at St. Austell, Cornwall, the elder son of William Willis senior, engraver and inventor of the 'aniline' process, William junior was trained and employed in engineering and banking before devoting himself to tackling the problem of photographic impermanence. His prime choice of platinum as image substance achieved slight success in 1873, followed by many years of persevering research and development in his private laboratory at Bromley, Kent, which yielded five British patents and brought the process finally to perfection and universal acclaim by 1892. To market his invention, Willis had launched his Platinotype Company in 1879, and he remained continually responsive to public taste and commercial demand by inventing new variations: sepia platinotype, 'japine' paper, palladiotype, and 'satista' paper. He travelled widely, including the United States, and business interests notwithstanding, delivered instructive lecture-demonstrations to the Camera Club and the Royal Photographic Society, which awarded him its Progress Medal in 1881, and elected him to Honorary Fellowship in 1905. Willis's dedicated lifetime of research has endowed photographic history with a legacy of the most permanent and beautiful images. He died a bachelor, at Brasted Chart, Kent, in 1923.

MIKE WARE

WILSON, EDWARD LIVINGSTON (1838–1903)
Publisher, advocate, teacher

A tireless advocate for professional photographers' rights and a prolific author, Edward Livingston Wilson was born in Flemington, New Jersey, on March 4, 1838. He began his photographic career working in the studio of Philadelphia photographer Frederick Gutekunst in the early 1860s. In 1864 he established the first photographic magazine in America, the *Philadelphia Photographer*, later known as *Wilson's Magazine*, and

remained its editor until his death. He published other photographic periodicals and authored several books including *Wilson's Photographics* (1881), *Wilson's Quarter Century in Photography* (1887), and *Wilson's Cyclopaedic Photography* (1894). He also wrote and lectured extensively about his 1881–1882 Middle Eastern photographic journey. Throughout his career, Wilson worked to establish fair photographic practices and to elevate the profession. He led the fights against a photographic tax and many restrictive patents. As a founder of the National Photographic Association in 1868 and its successor organization the Photographers' Association of America, he helped organize exhibitions and conventions around the country. Through Wilson's efforts, a separate Photographic Hall was built at the 1876 Centennial Exposition to display photographs and equipment. In addition to his publishing and advocacy work, Wilson manufactured and sold photographic equipment and supplies. After almost a decade of ill health, Edward Wilson died in Vineland, New Jersey, on June 23, 1903.

SARAH J. WEATHERWAX

WILSON, GEORGE WASHINGTON (1823–1893)

This pioneering Scottish photographer trained as a miniature painter before taking up photography as a career. He was one of the first photographers to produce photographs on a scale large enough to operate in a mass-market capacity.

George Washington Wilson was the second of eleven children. His father was a crofter, George Wilson (1777–1848). His mother, Elspet Hurd (1798–1883), was his father's second wife.

From 1830 to 1835 George Washington Wilson was educated at the local Parish school.

At the age of twelve he was apprenticed to a local carpenter, but moved to Edinburgh to follow a career as an artist in 1846. Little is known about his time in Edinburgh.

In 1849 he moved to London and became a pupil of the painter, illustrator and sculptor, Edward Henry Corbould (1815–1905), who also tutored the royal family in History painting. When George returned to Aberdeen he set up business as a miniature portrait painter. At the time, photography was on the ascendance, and threatened the livelihood of portrait miniaturist painters. In 1853 George took the unusual, but sensible decision to combine his talents with those of his friend, the photographer, John Hay, and they set up a business which offered portraiture in both media. Furthermore, he established many relationships with other local studios and because of his commercial links with them, published and disseminated their work as well. Always developing his connections with the photographic community, Wilson was a member of the Photographic Society of Scotland which met in Edinburgh in the 1850s and 1860s.

In 1855 Queen Victoria and Prince Albert commissioned Wilson and Hay to record the construction of their new residence which was being built at Balmoral. This was the start of a long association between Wilson and the royal family. He was granted a Royal Warrant in 1873.

In the late 1850s improvements in photographic technology allowed Wilson to use his Dallmeyer camera to become a pioneer in the field of instantaneous photography. This allowed him to capture landscape and sky without recourse to the artificial device of combination printing, which was standard practise at the time. In 1859 it was reported in the photographic press that Wilson had succeeded in taking the first 'instantaneous view' of Princes Street in Edinburgh. There is also a large print in the RPS Collection at the NmeN by Wilson which claims to be the first instantaneous photograph ever taken. Scotland had become a popular travel destination due to the success of Sir Walter Scott's romantic novels, combined with the growth of the railways, and Queen Victoria's patronage of all things Scottish. Wilson took the opportunity to provide photographic views of Scotland for the burgeoning tourist trade. Eventually he also began to provide topographic views of England and parts of Northern Ireland, to the extent where he rivalled the domain of the photographer, Francis Frith, who was also involved in the same business.

George Washington Wilson became a household name after he was able to take advantage of the craze for stereoscopic photography and produced an extremely popular range of stereoscopic views of the 1862 International Exhibition in London. In 1864 alone, Wilson's photographic business sold over half a million prints. The company continued to grow and became one of the largest photographic firms in the world. To accommodate this growth, larger premises were built in Aberdeen and Wilson embraced mass production techniques in order to meet the demand for his images. Despite such a high turnover, Wilson produced high quality, gold-toned prints. As a result it is not uncommon for his images to remain in excellent condition to this day.

Described as genial and good-natured, Wilson had two illegitimate sons with Isabella Johnstone in 1841 and 1844. Although they never married, Wilson did raise and educate the elder of his two sons, Alexander Johnson Wilson (1841–1921), who eventually became a well-known economist in London. In 1849 George Washington married Maria Ann Cassie, daughter of an innkeeper in Banff. They had five sons and four daughters together. Wilson died on 9 March 1893 at Queens

Cross, Aberdeen. He is buried at Nellfield Cemetery in Aberdeen.

The largest collection of George Washington Wilson's work was discovered in the attic of a house in Aberdeen in 1970, and is now held at the University of Aberdeen. Aberdeen Art Gallery and Museums now care for a second major collection of Wilson's work which was originally donated to Aberdeen Public Library by his son, Charles.

At the time of Wilson's death his photographic business employed forty staff. It continued for another nine years, until it was forced to close in 1902, primarily as a result from competition from less expensive, and easier to reproduce half-tone reproductions of photographs which became then became the standard format for postcards at that time. Even so, Wilson's negatives were purchased by Fred Hardie, a former employee of Wilson and used to produce postcards until 1920.

Brian Liddy

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WINTER, CHARLES DAVID (1821–1904)

French lithographer, painter, and photographer

Born in Strasbourg in 1821, Charles David Winter trained as a lithographer and painter before establishing a photographic studio at 1, rue des Calves, Strasbourg, that specialized in daguerreotype portraits. By 1851, he had adopted the paper negative process and by 1854, had mastered the wet collodion technique and was running a successful studio making portraits and *cartes de visite*. Winter's greatest accomplishments, however, are his photographs documenting the urban transformation of Strasbourg in the second half of the nineteenth century, including the building and demolitions in the city center (1855–80), the construction of a railroad bridge over the Rhine (1858–61), and the restoration of the Cathedral (1857–59). Winter exhibited at the Société française de photographie in 1857 and 1859. Striking for both their large size and their fine detail, his photographs revealed the formal beauty in new forms of architecture and engineering. Winter also recorded, in wrenching detail, the devastating destruction of Strasbourg following the Franco-Prussian war of 1870. After 1870, Winter illustrated and served as the editor of the *Bulletin de la Société de la Conservation des Monuments Historiques d'Alsace.* The largest holdings of Winter's photographs and albums are at the Municipal Library, Strasbourg, and at the Museum of Modern and Contemporary Art, Strasbourg.

Sarah Kennel

WITTICK, (GEORGE) BENJAMIN (1845–1903)

American photographer

Wittick established himself as a photographer in 1878 in New Mexico, working first for the railroad in the partnership of Wittick and Russell, later establishing studios in Albuquerque, Santa Fe, Gallup, and Fort Wingate, New Mexico, as well as in Arizona. Although he photographed the construction of the railroads and the growth of towns along the railroad route, he is best known for Native American subjects—both studio portraits and ethnographic studies of life and ceremonies. His portrait of Apache war chief Geronimo (Goyathlay) is one of the most famous images of a Native American. The portrait in which the chief poses against a studio backdrop with rifle in hand was made in 1887 after Geronimo's capture and was widely circulated. Wittick photographed many of the Apache and Navajo leaders as native groups were resettled. He was the first to photograph the Hopi snake dance ceremony, including the washing of the snakes and other rituals that took place in *kivas,* out of sight of observers. He died at Fort Wingate, New Mexico, in 1903, after being bitten by a rattlesnake which, it was reported, he had captured to transport to Hopi for the snake dance.

Kathleen Howe

WOLCOTT, ALEXANDER SIMON AND JOHNSON, JOHN (active 1839–1844)

Both involved in mechanics before the advent of the daguerreotype, Alexander Simon Wolcott and John Johnson were among the few significant American inventors in daguerreotypy from 1839 to Wolcott's early death in 1844. In this short period, the two partners' research and strategy were focussed on two goals that more broadly characterized the daguerreotype era in the United States: to devise a practicable method of making portraits, and to use it towards creating a profitable business; in both directions, they reached a marked—if short-lived—success.

Wolcott and Johnson began experimenting around October 6, 1839, after learning about Daguerre's method. The more mechanically-inclined Wolcott set out to design a new camera—one with an internal mirror instead of a lens—and within twenty-four hours he was able to secure a small portrait of Johnson. Although it is regarded as the first daguerreotype portrait made

in North America, this picture is lost and was probably mediocre, but it testified to the potential of the new camera, which was and remains the duo's main claim to fame. "Wolcott's camera" or the "mirror camera," as it came to be known after an improved version was awarded the first U.S. patent in photography in 1840, was indeed revolutionary, in that it incorporated, in lieu of a lens, a small concave reflector at the back of the box, which reflected the light coming in through the front opening onto a small plate (2 × 2½ inches) fastened near the front and facing back. This crude design was intended not only to palliate the cost of quality lenses, but to maximize the amount of light reaching the plate, so as to render portraits feasible by reducing exposure times. Although the mirror design had the added (and culturally more significant) advantage of redressing the lateral inversion of early daguerreotypes, augmenting the available light was clearly the primary concern, as was also the case in the sophisticated system of studio lighting Wolcott invented by coupling mirrors outside of the room's bay windows, and in many other improvements intended to produce more horizontal, more even, or less brutal lighting. Indeed, the intensity of the light concentrated on the sitter's eyes was unbearable for any length of time, which explains why the early portraits produced by Wolcott's camera were profiles, and why various means were attempted to soften the impact. In spite of this problem, the mirror camera was the principal asset of the studio that the pair opened on Broadway in March, 1840, probably the first commercial daguerreotype portrait studio in the world, and one that presented a remarkable internal architecture, embodying precocious thinking on lighting and extending the structure of the camera to the room's organization. This was true technical thinking on photography, and significantly it originated in a concern for the control of lighting in portraiture, thus departing from the abstract bend of many early responses to the invention of photography. Thus, it is inconsequential that Wolcott's mirror design may have been predated by earlier European publications on the subject, as was in fact the case with some other methods developed by the tandem, such as Wolcott's "accelerator," a mixture of bromide and chloride for increasing plate sensitivity. Whether or not they were aware of such publications, Wolcott and Johnson were most efficient on a strictly technical level, for instance in developing various methods of polishing silvered plates (by grinding and, later, by buffing), which earned them a second U.S. photographic patent in 1841. In this consistent effort to make the daguerreotype a practical and artistic portrait process, they contributed to an important pattern in the U.S., where the application of ingenuity to the handling of light, as well as the perfecting of daguerreotype plate surfaces, were durable trends.

Similarly, the entrepreneurial drive of the pair was precocious and characteristic, although their commercial career was short-lived. Along with the New York studio, the two associates created an establishment in Washington, D.C. (where basic equipment was still very scarce in the summer of 1840), and one in Baltimore. More significantly even, as early as February 1840, the duo sent Johnson's father to England to secure a patent for the mirror camera (which could only be done by paying a fee to Daguerre's agent) and to develop a daguerreotype business in partnership with the investor Richard Beard, with whom they opened a studio in London in March 1841. Although the Wolcott-Johnson business in New York met with heavy competition and indifferent success (the studio being sold in the fall of 1841), in London the Beard studio was for a time the only one to compete with Antoine Claudet's, and thanks to the mirror camera it attracted a good deal of business and attention in 1841–1842, while in other British cities the Beard-Johnson partnership successfully operated subsidiaries until 1843–1844, to the extent that the associates engaged in local factory production of mirror cameras and polished plates. In fact, much of the pair's time was spent in England in the years 1841–1843, and in March 1843 they obtained a British patent for a method of copying and enlarging daguerreotypes, while letters that were published later show that by 1843 Wolcott was working on a system of coating glass plates with egg whites, subsequently hailed as a near-invention of the albumen process. Had Wolcott not come to an early death in 1844, he would likely have renounced his mirror camera, which produced mediocre images and painful effects on sitters, which never seriously threatened the classic lens camera, and which was definitively superseded after the new Petzval lens (coupled with a prism that reversed the image) was introduced in 1843. Nonetheless, its bold and simple design remains a major example of American technical ingenuity in the era of the "dag'type," while the partners' insistence on patenting their improvements and expanding their business announced the professional and commercial course of 19th-century American photography.

François Brunet

Biography

Born in 1804 in Connecticut, Alexander Simon Wolcott had, before 1839, been active as a mechanic in optics, dentistry, and steam engines; in October 1839, he went into partnership with John Johnson, who was born in 1813 in Maine and had previously been a "machinist." As early as October 6 or 7, Wolcott made the first daguerreotype portrait in the United States with a prototype of the "mirror camera," which was patented on May 8, 1840 (U.S. patent #1,582), and put into service on March 13, 1840, in a commercial studio on

Broadway in New York, as well as in branch offices in Washington, D.C., Baltimore (under Henry Fitz, Jr., a telescope maker who had collaborated in the design), and several cities in Britain (in partnership with Richard Beard). The duo obtained the second U.S. photographic patent for a method of polishing plates (December 14, 1841, #2,391), and sold an accelerator called "Wolcott's mixture." After Wolcott died in 1844 in Connecticut, Johnson turned to other mechanical activities, although he remained involved in photography and published documents on his partnership with Wolcott. He died in Maine in 1871.

See also: Daguerre, Louis-Jacques-Mandé; Daguerreotype; and Camera Design: 1 (1830–1840).

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WOLLASTON, WILLIAM HYDE (1766–1828).

English chemist, natural philosopher, physiologist, inventor

Born August 6, 1766, in East Dereham, Norfolk, England to the Rev. Francis Wollaston (1731–1815) and Althea Hyde, he attended Cambridge University and, awarded a degree in medicine 1793. He became a Fellow of the Royal Society, 1793 and Foreign associate of the French Academy of Sciences. Wollaston published scientific papers in the 1790s.He gave up his London medical practise in 1800 to pursue scientific research and, with Humphry Davy, investigated physiology. Wollaston discovered the metals palladium and rhodium, and devised a lucrative process to produce malleable platinum. His electrical work included an improved battery. Wollaston's optical work included investigations of the solar spectrum. In 1806 he designed and patented the camera lucida, a glass prism on a support which enabled an artist to trace an impression of a view, ensuring accurate perspective. Fox Talbot's difficulty in producing acceptable drawings using the camera lucida, which required artistic skill, spurred his chemical experiments in photography. In 1812 Wollaston produced a camera obscura with improved 'periscopic' (meniscus) lens. Niépce used one of these lenses, made by Chevalier, in his 1828 photographic experiments. A Wollaston-type lens was used in the 1839 Daguerre-Giroux camera. In 1806 Wollaston was elected Secretary of the Royal Society, and interim President 1820. He died in London, December 22, 1828. The mineral Wollastonite, a Canadian town, and a Geological Society (London) medal are named in his honor.

STEPHEN HERBERT

WOMEN PHOTOGRAPHERS

Historians have downplayed the role of women photographers even though they were among its earliest practitioners and took an active part in all areas of photographic endeavour during the nineteenth-century. The economic, social, and cultural constraints, which governed women's lives, were also to shape their choice of subject matter and the manner in which their photographic work was perceived. The Victorian emphasis upon the domestic role of women narrowed the range of experiences that were available to many women, however, this does not lessen the work of those amateurs who utilized photography to record and construct accounts of their lives and those of their families. Photography also provided women with a way of earning a living beginning with the pioneer studio owners and itinerant daguerreotypists of the 1840s and expanding to include the legions of women workers who were the preferred employees in certain sectors of the photographic industry.

On an artistic level, women perhaps benefited from the fact that the new medium of photography was not a subject for academic study. It was therefore freed from the hierarchy and regulations which were attached to the Fine Arts and which often precluded women's full participation within them. In some respects this freedom made it easier for women to play a notable role in international photographic movements such as Pictorialism**.**

A small number of women contributed to the pre-history of conventional photography and were engaged to a limited extent in the scientific experimentation which preceded the announcement of the Daguerreotype and paper negative processes in 1839. In the late eighteenth and early nineteenth century it was not altogether unusual for some wealthy women to have some popularized knowledge of science and to cultivate this interest on a limited basis. Elizabeth Fulhame, who published a book in London in 1749 outlining her attempts to create permanent images by light, could be numbered among

these women. So too could Friederike Wilhelmine Von Wunsch, a German artist who in 1839 claimed to have discovered a method for producing photographic portraits. Women also formed a substantial part of the growing middle-class clientele who commissioned silhouettes, miniatures and camera lucida drawings in the decades before 1839 thereby creating a demand for the production of likenesses which the photograph was to satisfy.

The earliest women amateurs who used the Calotype process belonged to the upper strata of society as only they were privy to the expertise and know- how required to master this difficult process. In England, they included the relatives and friends of the physicist William Henry Fox Talbot, who announced his positive/negative process in 1839. His wife, Constance Talbot, printed her husband's Calotype or Talbotype negatives whilst occasionally making her own exposures and prints. Her engagement with photography alongside that of Talbot's Welsh relations Emma and Mary Llewelyn typifies the elitist circle of friends who used the calotype process. In Ireland, Louisa Tenison and her husband of Kilronan Castle, County Roscommon and Mary, Countess of Rosse, Birr Castle, County Offaly, were amongst the first women to use the process. Due to the complicated nature of taking calotypes and printing negatives those who used the medium often worked with partners. For women, the societal emphasis upon the work of their spouses often meant that their role was unacknowledged. For example, Harriet Tytler worked with her husband to record the aftermath of the Indian Mutiny of 1858. Yet their work using large paper negatives has been attributed solely to her husband.

Debates concerning the nature of photography took place in journals throughout the nineteenth century. One of the earliest and most important commentators was Lady Elizabeth Eastlake (1809–1893) whose husband Sir Charles was the first president of the Royal Photographic Society. Among other aspects of photography, she explored its relationship with the fine arts. A piece by her which was published in the *London Quarterly Review* in 1857 revealed an astute understanding of the photographic medium. Eastlake decided that photography could not be considered as a true art, however, she astutely points to some of its possible uses.

> She (photography) is made for the present age, in which the desire for art resides in a small minority, but craving, or rather the necessity for cheap, prompt, and correct facts in the public at large. Photography is purveyor of such knowledge to the world. (Eastlake 1857, 93)

Frederick Scott Archer's invention of the wet collodion process in 1848 and Louis-Désiré Blanquart-Evrard's introduction of the albumen print in 1850 resulted in an increased number of women taking up photography on an amateur basis. Women amateurs were still chiefly drawn from aristocratic or well-to-do backgrounds and the wet plate process was far from straightforward. This was particularly so for outdoor work as the glass plates had to be coated and developed immediately. These lady amateurs added photography to other female hobbies such as sketching and needlework. That photography was considered a suitable pursuit for such genteel ladies is perhaps incongruous given the fact that they had to mix their own chemicals. They gained access to technical information through informal networks of friends and family or from the many technical manuals which were available by the 1850s.

The subject matter chosen by most women amateurs reflected their leisured lifestyles and confinement within the domestic sphere. They used photography as a form of personal biography and tended to make straightforward formal portraits of their children and family within domestic settings. Their domestic imagery provides a direct link to later women's snapshot photography. That they recorded their environment in a selective way is evidenced in the exclusion of the staff, who facilitated their lifestyles, from most photographs. Many were aware of their families special position within society and asserted their relationship with the land through photographs of the family home and its surrounding parkland. Their photographs were mostly destined for albums which were produced and circulated in a private environment. These albums had origins in the earlier keepsake or sentiment albums which contained poems, pressed flowers and water-colours. They were often intricately decorated and were shown to an audience of family and friends. Examples of this genre include the early work of Lady Clementina Hawarden (1822–1865), at Dundrum, County Tipperary, Ireland; Augusta Crofton Dillon at Clonbrock House, Ahascragh, County Galway, Ireland and the photographs taken by the sisters Lady Augusta Mostyn and Lady Caroline Nevill. They were also part of the Amateur Photographic Association whose members exhibited their work in London and also sold and exchanged prints. The work of Mary Paraskeva at Baranovka in the Crimea covered similar country house subjects.

The albums created by Lady Frances Jocelyn in the 1850s, and Charlotte Milles and Lady Mary Georgiana Filmer (1838–1903) in the 1860s, demonstrate the creative energy and inventiveness that could be invested in the production of photographic albums. These women produced photographic collages, a process which involved the cutting up of photographs and their insertion among painted backgrounds. The placing of images of different sizes and the use of different mediums such as watercolours subverted the realistic nature of photography. As careful consideration was given to the order and sequence of images within such personal albums,

it is important that institutions and collectors maintain the referential integrity of these volumes. Such albums should be considered as a single item rather than a series of unrelated images.

One woman who departed from the typical themes of amateur image making was Lady Clementina Hawarden (1822–1865). From 1857 until her untimely death, she created over eight hundred photographs mainly of her adolescent daughters caught in private moments of reflection or in fancy dress. Hawarden's atmospheric and sensual images were carefully constructed through the use of fabric and props and reveal an inner private world rather than a mere record of family life. Hawarden's original treatment of the domestic realm is in contrast to previous amateur practice. Although they utilised the same wet-plate process and albumen printing as Hawarden most amateurs chose more formal and stiff poses. The themes of the Pre-Raphaelite art movement are reflected in her photographs and she demonstrated a sensibility that is not visible in much of the amateur practice of this era.

In the mid-1860s another Englishwoman was to commence the production of distinctive photographs within her home. Julia Margaret Cameron's (1815–1879) romanticised portraits were influenced by the Pre-Raphaelite painters. She used family, friends, and servants to re-create biblical scenes and Arthurian legends. She also created idealised portraits of her many famous friends and acquaintances. . Like Hawarden she used the wet plate process and made albumen prints. She experimated with close-up shots and was not overly concerned about the precision of her images preferring to capture atmosphere and expression using a soft focus. Critics were divided as to the merits of her work mainly due to its lack of sharpness. Both Cameron and Hawarden entered their work into exhibitions held by the Photographic Society of London. Cameron also made money from her photography consequently blurring the lines between amateur and professional practice. Her pioneering artistic vision widened the notion of what constituted a good photograph. Another woman who interacted with the photographic medium in a unique and creative way was Virginia, Countesse de Castiglione (1837–1899). She commissioned over four hundred portraits of herself from the Mayer & Pierson studio in Paris. She chose elaborate costumes and backgrounds to create vibrant tableaux. These images, which she then hand-coloured, re-created scenes from her own life or from novels. Although she did not take the photographs her input represents an example of the use of photography as a tool for self-expression.

Lady Eastlake's exploration of the uses of photography included reference to its application within scientific research. Anna Atkins (1799–1871) was one of the earliest female botanists to use photography to illustrate their work. She worked with the Cyanotype contact printing process which was invented by Sir John Herschel. The brilliant blue cyanotype prints, which result from the action of light on paper sensitized by iron salts, were used by Atkins to accurately depict her collection of botanical specimens. She painstakingly illustrated her work *Photographs of British Algae; Cyanotype Impressions* over a ten year period from 1843. This work is considered to be the first photographically illustrated book and constitutes a formidable piece of research and contribution to scientific knowledge. Atkins's work demonstrated that women were capable of undertaking serious research within the natural sciences. It also reflects the Victorian preoccupation with the collection and classification of natural phenomena. Alice Le Plongeon (1851–1916) and her husband Augustus took photographs of archaeological finds from their excavations in the jungles of Mexico and these images which date from between 1873–1885 are amongst the earliest uses of photography in the field of archaeology. Both Atkins and Le Plongeon provide evidence of women's participation in a wide range of photographic practices.

The female members of several royal families promoted photography either through their patronage of certain photographic formats or by taking pictures themselves and compiling albums. In England, Queen Victoria precipitated the craze for stereoscopic photography by admiring a set at the Great Exhibition in 1851. By permitting the sale of royal portraits she started the trend in collecting cartes-de-visites of famous people. In Austria in the 1860s Empress Elizabeth collected and commissioned hundreds of portraits. Queen Victoria's daughter, Princess Victoria who married Crown Prince Friedrich in 1858, was a committed amateur photographer. Alexandra, Princess of Wales, acquired a Kodak roll-film camera in 1889 and created many images which she even exhibited. Several members of the Russian royal family also took photographs.

Women were also involved in the production of commercial portraits from its inception. A small number of women ran their own daguerreotype studios in England in the early 1840s. There is evidence of work undertaken by Marie Chambefort, an itinerant daguerreotypist, who was active in France around 1850. Some of these women may have been previously engaged in the production of miniatures and were merely combating the threat to their living posed by photography. Others had the role thrust upon them through the tragic event of widowhood or the death of their fathers. In the United States, where the daguerreotype attained the peak of its popularity, women were also establishing and managing studios during this formative period.

The number of portrait studios increased between the 1850s and the 1870s as tintypes and cartes-de-visites cut the cost of photography. During this boom, there was

naturally a rise in the number of women listed as proprietors of photographic studios in both the United States and Europe. It appears that societal constraints were lessened in the United States and that women were more likely to set up businesses and travel independently than in Europe. Hannah Maynard (1834–1918) set up a studio in Victoria, Vancouver Island in 1862 and proceeded to make a record of the landscape and people of Canada. She also embraced a wide variety of photographic techniques. These included montages, figures in motion, photosculpture, multiple exposures, composite images and the use of mirrors. She pioneered the use of these artistic techniques to investigate the notion of the self and her involvement with the spiritualist movement led to the creation of unconventional and surreal images.

An African American woman, Mary E. Warren, was listed in a Houston, Texas, directory for 1866 as a photograph printer. In 1867 Marie Lydia Bonfils and her husband Felix set up La Maison Bonfils in Beirut where they had relocated to from France. The studio was responsible for portraits and topographical views of the Middle East. Lydia took many of the studio portraits and continued to run the business after her husband's death. Clémence Jacob Delmaet was involved in the running of the Delmaet & Durandelle studio which specialised in architectural and engineering subjects and was active between 1854 and 1890. Geneviève-Elisabeth Disdéri worked separately to her husband to create views of the countryside in Brest between 1852 and 1872. Swedish studio photographers included Bertha Valerius (1824–95) and Rosalie Sjöman (1833–1919). From 1890 the Letter-Verein Photographic School in Berlin taught women a variety of photographic techniques. By the end of the century, there were several very successful society portrait photographers including Catherine Barnes Ward in the United States and Christina Broom in England. Broom was also considered to be England's first photo journalist taking photographs of suffragist events and specialising in photographs of London. Both women were advocates and role models for professional women within photography.

Women also found employment behind the scenes in portrait studios. They were involved in routine work on assembly lines where they were employed in activities such as the cutting of cartes-de-visite images. For example, the William Notman studio in Montreal employed a large number of women as retouchers and printers. Women worked as dressers attending to the hair and attire of female sitters. They were engaged at several levels within the studio either as receptionists or as hand tinters. Portraits printed on albumen were often over-painted in oils, watercolours or pastels. These over-painted photographs were reminiscent of the higher status portrait painting. Later women were to be employed in the processing and production of photographic materials in large scale factories, such as those run by the Lumière Brothers and Kodak.

Pictorialism which imitated the conventions of fine art, attracted American women such as Gertrude Käsebier and the Englishwomen Agnes Warburg and Emma Barton. This international movement whose tenets were debated by H.P. Robinson and Peter Henry Emerson sought to create photographs which rivalled painting in its expression of emotion and atmosphere. Some advocates manipulated negatives or used the gum bichromate process. American practitioners of the 1880s included Mary F.C. Paschall, Mary T.F. Schaeffer, Eva Watson, and Louise Deshong Woodbridge. The American Anne W. Brigman was a central figure in this movement photographing female nudes in the spectacular natural surroundings of the of the Sierra Nevada mountains of Northern California. She was a founder member of the Photo-Seccession and influenced later photographers such as Louise Dahl-Wolfe. Gertrude Käsebier opened her New York studio in 1897 and her work repeatedly explored the mother-child relationship and allegorical themes. The Brotherhood of the Linked Ring was founded in England in April 1892 and sought to advance the field of art photography, however, it did not admit women until after 1900. Käsebier was the first female to be elected and was also a founder member of the Photo-Secession. Her simple portrait style was widely emulated. She also succeeded in coupling her artistic ambitions with financial success. Zaida Ben-Yusuf was another successful fine art photographer who was active from 1897 to 1907. Pictorialism also had an impact on the work of the Dührkroop studios in Berlin and Hamburg where Mina Dièz-Dührkroop worked with her father.

Female documentary photographers included Alice Austen and Frances Benjeman Johnston in the United States. Alice Austen was an avid amateur photographer based in Staten Island. Her sharp focused images of upper-middle-class life and those of immigrants at the Hoffman Island quarantine station and on the Lower East Side of Manhattan prefigured later documentary styles. Johnston combined studio portraits of notable figures with prize winning documentary photographs of the Washington School system. Jessie Tarbox Beals worked in newspapers and as an itinerant photographer in Massachusetts. Geraldine Moodie (1854–1945) photographed the life of pioneers in the Canadian West. In addition to her mother and child portraits, Gertrude Käsebier photographed Native Americans in the Pictoralist tradition.

For the most part images of Africa, Australia, and Asia were constructed from a colonial viewpoint as women photographers tended to be the European wives or daughters of those employed in the maintenance of Empire. One such woman was Lady Hariot Dufferin (1843–1936), Vicereine of India, who recorded her ex-

perience in India between 1884 and 1888. She published a two volume account of her time in India and also photographed the Indian people and landscape. Whilst travelling in Iran in the 1880s, the Frenchwoman Jane Dieulafoy photographed everyday life and people. The detailed and informative descriptions which accompanied her images reveal a documentary rather than a tourist agenda.

The technological innovations which heralded the true popularisation of photography enabled millions of women to take up photography. George Eastman's famous advertising slogan 'You press the button, we do the rest' referred to his roll-film Kodak camera. From 1888, photographers could return their camera containing exposed films to Eastman's factory where the film would be developed and printed. Advertisers were quick to recognise that women were a large part of the market and many campaigns were aimed at the young mother or the independent young woman who was free to combine the new hobby of cycling with the taking of snapshots.

ORLA FITZPATRICK

See also: Albums; Amateur Photographers, Camera Clubs, and Societies; Atkins, Anna; Archaeology; Blanquart-Evrard, Louis-Désiré; Bonfils, Fèlix, Marie-Lydie Cabanis, and Adrien; Brotherhood of the Linked Ring; Calotype and Talbotype; History: 1. Antecedents and proto-photography up to 1826; Cameron, Julia Margaret; Cartes-de-Visite; Cyanotype; Daguerreotype; Rigby, Lady Elizabeth Eastlake; Eastman, George; Emerson, Peter Henry; Talbot, William Henry Fox; Great Exhibition of the Works of Industry of All Nations, Crystal Palace, Hyde Park (1851); Hawarden, Viscountess Clementina Elphinstone; Herschel, Sir John Frederick William; Jocelyn, Lady Frances (Fanny); Käsebier, Gertrude; Kodak; Lumière, Auguste and Louis; Potographic Exchange Club and Photographic Society Club, London; Pictorialism; Robinson, Henry Peach; Royal Photographic Society; Archer, Frederick Scott; Tintype; and Victoria, Queen and Albert, Prince Consort.

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WOOD, JOHN MUIR (1805–1892)

Scottish pioneer of photography

John Muir Wood was a pianist, music teacher, musicologist, and impresario, who was educated in Paris and Vienna. Moreover, he had wide interests in recent developments in science and the visual arts, which he combined in his photographic experiments. Although he had no direct access to Talbot and was not an official member of any photographic societies, he undoubtedly had connections with British pioneers such as Hugh Owen, Joseph Cundell, Charles John Burnett and with scientists dealing with the chemical and optical aspects of photography. In addition, Wood had close contacts with artistic circles. Besides his affiliations in the music world, he was close friends with the painters James Eckford Lauder and Charles and Henry Cundell. As a photographer, he remained an amateur throughout his entire life. This, undoubtedly, gave him a far greater freedom than most professional photographers, who often had to specialize in portraits and tourist views that answered to stereotypical formulas determined by public demand. Wood's oeuvre, by contrast, was far-ranging in subject-matter. It included portraits, figure-compositions, studies of sculpture and architecture,

and, more importantly, townscapes and landscapes. In addition, he experimented abundantly with inventive techniques. However, this dilettantism, displaying the true spirit of the pioneer, did not imply a sloppy output. On the contrary, highly educated and sophisticated both in his knowledge of chemistry and in his experience and understanding of the visual arts, Wood made some exceptional photographs in the 1840s and 1850s. These pictures are original accomplishments, both on the scientific and artistic sides of photography. It still is a mystery why his name does not turn up in most general surveys of the history of the medium.

His portraits and group portraits, which sometimes depict his friends from art circles, are typical for the early years of photography. Showing some similarities with the work of David Octavius Hill and Robert Adamson, they can be considered as exercises in finding appropriate positions while dealing with relatively long exposure times. Some of his group portraits are situated in a garden setting, taking the photographic portrait away from the studio and insisting on giving the figures a context in which their lives and day-to-day existence could be suggested and felt. Nevertheless, his figures are often isolated and they show a frozen and oddly sculptural effect. Wood, for that matter, photographed sculptures as well, just as Daguerre and Talbot did. A bust of Bacchus, for instance, is photographed from different viewpoints and under different lighting conditions. This interest in rendering three-dimensional volumes by means of light and shadow is also present in some of his portraits, in which even a Caravagist *claire-obscure* is achieved.

In the summer of 1847, John Muir Wood made a trip to the continent. After a brief stopover in York and London, he visited Belgium, which was developing into an important tourist stop for English and Scottish travellers. Not only was it the inevitable first stop on a *Grand Tour* on the continent but the romantic predilection for the Middle Ages also stimulated the interest in the old Flemish cities with their belfries, cloth halls, cathedrals and castles. Muir, just like George Moir of the Edinburgh Calotype Club or Talbot, contributed to this tourist exploration by taking pictures of medieval city centres. He also wrote a kind of travel report, in which he carefully noted which pictures were taken on which day. His trip brought him to Bruges, Ghent, Mechelen, and Brussels. After Brussels, he did no longer include remarks on photography, but his diary indicates that he also visited the battlefield of Waterloo, and the cities of Namur, Charleroi, Huy, and Liège, where his report ends abruptly. Probably, this travel report is incomplete because his estate also contains pictures of Antwerp and Leuven. It is also possible that he continued his journey in Germany, where he photographed the cities of Cologne, Heidelberg, Nuremberg, and Munich—it is also possible that these pictures were made during another trip since the dates are not indicated and probably prints were made years after the negatives were taken. His pictures of Flemish cities are both important historical documents and examples of an original photographical approach to the motif of the city. His depiction of the Groene Rei in Bruges is one of the oldest photographs of that city but also an example of Wood's consummate skill to make a balanced composition. Wood, playing with the diversity of tones, clearly had the photographic capacity to imagine the final result of his shooting. This is also the case in his Ghent pictures, which give us valuable information because they show the city before its major urban transformations of the later nineteenth century: the belfry has still its old wooden crowning and the castle is mostly hidden behind the houses built against it. The picture of the Ghent castle is a perfect example of Wood's response to the picturesque disorder of medieval towns. Unmistakably, he is more interested in the all-over pictorial effect than in architectural details or construction.

This aesthetic of the picturesque also turns up in his photographs of the ruins of Melrose Abbey and his evocations of the Scottish landscape, which was presented, both in the work of native and foreign artists and poets, as the ultimate romantic landscape. Wood also tried to register the sublime vagueness and freakishness of the Scottish scenery, answering to the romantic sensibility of his musical preferences. Often, he refers to traditional pictorial conventions, of which he had a sophisticated understanding. In other cases, he created remarkable unconventional and impenetrable compositions of woodlands without subject matter.

Throughout his career, Wood used the calotype instead of the highly polished metal daguerreotype or the later albumen process on glass. Even long after the introduction of glass negatives, he continued to use paper negatives. The calotype, of course, suited perfectly his picturesque way of seeing, which favoured the vivid all-over effect and subtle gradations of light over details and sharpness. His attention to light and hues lay also at the base of his experiments with different printing processes in the 1850s and 1860s, which resulted in an unparalleled chromatic intensity and vibrancy of color.

STEVEN JACOBS

Biography

John Muir Wood was born in Edinburgh in 1805. Being part of a family of piano-makers and music publishers, he became a pianist, music teacher, musicologist, and impresario. After an education in Paris and Vienna in 1826–1828, he set up as a music teacher and joined his brother George in the family business. He organized concerts for famous musicians including Chopin and Listz and did research on the history of Scottish music.

In 1848 he moved to Glasgow, where he married Helen Kenlo Stephen in 1851, who bore him thirteen children. Most of the pictures of his varied photographical oeuvre were taken in the late 1840s until mid 1850s but he continued to experiment with printing processes until the mid-1860s. He died in 1892 in Cove on the west coast of Scotland. His work is preserved in the Scottish National Portrait Gallery in Edinburgh.

See also: Amateur Photographers, Camera Clubs, and Societies; Hill, David Octavius, and Robert Adamson; Edinburgh Calotype Club; and Talbot, William Henry Fox.

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WOODBURY, WALTER BENTLEY (1834–1885)

English photographer and inventor

Walter Bentley Woodbury, inventor of the Woodburytype photomechanical printing process, was born in Manchester, England on 26 June 1834. He showed signs scientific tendencies and, as a youth, mastered the difficult wet-collodion process soon after it was published in 1851.

Woodbury arrived in Melbourne in October 1852, but instead of going to the goldfields as planned, he decided to put his photographic skills to use. He was one of the earliest wet-plate photographers in Australia and at the 1854 Melbourne Exhibition won a medal for a set of '9 views of Melbourne, taken by the Collodion process on glass.' A versatile photographer, he took panoramas and stereo photographs as well as conventional views, and even made his own collodion. He set up a studio in North Melbourne and for a time operated studios on the Victorian goldfields.

In 1857 Woodbury, with his associate James Page, travelled to Java. After Woodbury solved the problem of working the collodion process under tropical conditions their photographic business became highly successful. In addition to their commissioned work they travelled the country taking photographs for sale. Woodbury's stereo views, published by Negretti and Zamba, were favourably reviewed in the *British Journal of Photography*.

Shortly after returning to England in 1863 with capital from his Java business, he devoted himself to solving the serious problems which were inhibiting the sale of photographic books—the slow production rate of albumen prints and their tendency to fade. He moved from silver-based chemistry to the permanent but imperfect dichromate-based carbon process of Alphonse Poitevin, the main shortcoming of which was the poor rendering of half-tones. After much arduous work he was successful in combining Poitevin's process with aspects of Fargier's carbon process and innovations of his own. Woodbury arrived at an entirely novel solution to photomechanical printing for which he filed British Patent no. 2338 of 1864. He later improved the process by incorporating the technique of nature printing in which the hardened gelatin matrix was forced into a sheet of lead under high pressure. Prints in pigmented gelatin were then cast from the resulting lead mould. The salient features of the Woodburytype printing process were that it was suitable for high production rates of high quality images while avoiding the use of introduced grain or the half-tone screen. The half-tones and delicate detail were reproduced smoothly and precisely by the varying thicknesses of pigmented gelatin.

To publicise his process Woodbury himself printed several thousand images for an insert in *The Photographic News* of January 26, 1866, and enthusiastically promoted his invention by means of demonstrations to learned societies, entries in exhibitions and articles in the photographic press. In 1875 he produced a photobook *Treasure Spots of the World* as a demonstration of the superb quality of well-made Woodburytype reproductions. Although the cost of the necessary machinery put Woodburytype out of the reach of small operators, it became the process of choice for high quality illustrated books as well as being equally suited to the mass production of ephemeral items such as *cartes-de-visite* of stage personalities to be given away as advertising material. In one notable instance 30,000 prints were made in one day. Woodbury licensed the process in several countries. It was also adapted successfully for the production of lantern slides in large quantities.

Described as 'technically perfect' and the most beautiful printing process ever invented-it was, however, not without its problems. The afterwork on the prints was labour-intensive as each sheet had to be hardened in an alum bath, washed, dried, trimmed, and mounted. Furthermore, the prints could not be combined with letterpress.

In 1879 Woodbury patented the simplified Stannotype process but the modification came too late to compete with cheaper but inferior processes. The 1884 Woodburygravure process was more compatible with book production but also failed to gain acceptance. Woodburytype was highly successful in England and on

the Continent until about 1890 but was less adaptable to the extremes of temperature found in North America and Australia. Woodbury also adapted the process for watermarking paper.

When visiting the United States in 1871, Woodbury acquired the English rights to the popular Sciopticon lantern projector. He was a prolific and versatile inventor, holding more than twenty patents, including improvements to optical lanterns and photography from a balloon. His last patent was for a method of making paper transparent for use as a support for the emulsion.

Woodbury was awarded many honours including a gold medal at the 1872 Moscow Polytechnic Exposition and the 1883 Progress Medal of The Royal Photographic Society.

Although widely acknowledged and respected, he lacked the business acumen needed to capitalise on his inventions. Woodbury contracted diabetes and died on 5 September 1885 at Margate, England, from an accidental overdose of laudanum.

Woodbury's importance as a photographer lies in his photographs of Australia and Java which are now of historical value. His fame as an inventor is assured by the legacy of superb prints made by the process which bears his name. Time has proved that the claim to permanence of Woodburytype prints was essentially correct.

ALAN F. ELLIOTT

Biography

Walter Bentley Woodbury, born in Manchester UK in 1834, joined the Australian gold-rush in 1852 but turned to photography. In 1857 he opened a successful photographic studio in Java. Returning to England in 1863 he devoted his life to inventions including the Woodburytype photomechanical printing process. He died at Margate, UK, in 1885.

See also: Negretti and Zambra; Projectors; Wet Collodion negative; and Woodburytype, Woodburygravure.

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WOODBURYTYPE, WOODBURYGRAVURE

Woodburytype is one of the finest of all photomechanical reproduction processes, producing continuous tone images that resemble carbon prints. Originally known as the photo-relief process (or, in France, *photoglyptie*), woodburytype was invented in 1864 by Walter Bentley Woodbury, although Joseph Wilson Swan**'s** photo-mezzotint process, conceived earlier but published later, is virtually identical. The end product is a relief image in semi-transparent pigmented gelatin, thick in the shadows and thin in the highlights, giving excellent photographic gradation.

The process of making woodburytypes begins with the exposure and development of a positive relief image in a thick film of dichromated gelatin. Exposure through a negative differentially hardens the sensitized gelatin, which is developed by washing away the unexposed parts in warm water. This master relief is then used to produce a shallow negative intaglio printing mold with the highlights as hills and the shadows as hollows, usually by sandwiching the dried, hardened relief against a sheet of lead in a powerful hydraulic press, an idea Woodbury took from nature printing. Considerable pressure is required: about 4 tons per square inch, or 500 kilograms per square centimeter, depending on the thickness and hardness of the lead, and the size and nature of the image. In the early 1870s, a hydraulic press capable of 450 tons pressure cost £156, although a short time later, Tangyes of Birmingham began manufacturing a compact woodburytype hydraulic press with a short throw, suitable for 10 × 8 inch (25 × 20 cm) plates, which sold for about £60 (by way of comparison, an Albion press, suitable for letterpress printing, cost about £10).

Woodburytype prints are cast (rather than conventionally printed) using a special, less powerful, hand press capable of positioning paper perfectly flat against the mould. A small amount of warm pigmented gelatin "ink" is poured onto the center of the lightly greased, carefully leveled mould, and covered with a sheet of specially-prepared, waterproof paper. The top plate of the press is swung down and closed, forcing the gelatin into the contours of the mould. After about a minute (to allow the gelatin to set and adhere to the paper), the print is peeled out of the press, plunged into an alum bath to harden, rinsed, dried, and finally trimmed and mounted onto either a book page or printed card mount.

To increase productivity while waiting for the gelatin to set, printers usually worked a number of presses, either on a rotating turntable, or in the case of larger presses, lined up along a bench. However the extra work involved in trimming and mounting, necessitated by the excess colored gelatin squeezed out around the edges of the woodburytype image during printing (and a tendency for prints to curl), reduced efficiency, and mounting on thin text paper could produce an unattractive cockle.

The color used in woodburytype "ink" is generally Indian ink with a small amount of pigment added to suggest a gold-toned albumen print. Unusually colored woodburytypes, or prints on specially tinted paper (and even wood and ivory), are rare considering the ease with which they could be produced. However the woodburytype process is particularly well suited to glass, and firms such as John Carbutt**'s** American Photo-Relief Printing Company and George Smith's Sciopticon Company marketed highly regarded lantern slides and stereo transparencies.

Woodbury's slightly simplified stannotype process, introduced in the early 1880s in an attempt to make woodburytype more attractive on a smaller scale, differed only in the method used to produce a printing mould. Stannotype eliminated any need for an expensive hydraulic press for the production of lead moulds by the expedient of printing directly from a tinfoil-coated negative dichromated gelatin relief. However stannotype was only a limited success, as most amateurs found the production of gelatin reliefs difficult and time consuming, and large scale professional woodburytype printers preferred the old method, as they already had the necessary equipment to produce multiple lead moulds from a single relief (limited by eventual crushing of the relief), in order to simultaneously print, for example, either eight cartes-de-visites or four cabinet cards, depending on the size of the press.

When justified over albumen for larger print runs, woodburytype offered the permanence of the carbon print and the productivity of traditional hand-inked printmaking. In 1877, the 8,500 prints needed for a frontispiece to the *British Journal Photographic Almanac* were run off in three days "with the *nonchalance* characteristic of a photographic portraitist whose transactions are on an extensive scale, when requested to furnish half-a-dozen prints from any particular negative." However maximum print size was limited: although 10 × 14 inches (25.5 × 36 cm) was achievable with special mammoth hydraulic presses, most woodburytypes are far smaller. Difficulties distributing the gelatin "ink" during printing further limited both size and the reproduction of highlights: although capable of rendering exquisite, luminous shadow details, unfortunately clear skies and other large white areas can appear mottled. These drawbacks forced practitioners such as Adolphe Braun or Friedrich Bruckmann to adopt alternative processes for larger sizes or specific subjects.

Woodburytype flourished from about 1870 to 1900, although because of the initial patent restrictions (Woodbury took out patents in Great Britain, France, Austria, Belgium, Italy, Prussia, and the United States), large capital equipment costs, and its technically demanding nature, use was limited to a small number of specialist firms, mainly in Great Britain and France, and on a smaller scale, in Belgium, Germany, and the United States. In Portugal and Australia, the process failed to meet expectations. In France, Goupil & Cie and later Lemercier dominated, while in England, the then sole licensee, the Woodbury Permanent Printing Company apparently saw nothing remarkable in producing one and a half million prints in the first six months of 1876.

At its peak in the 1870s and 1880s, woodburytype was extensively used to photographically illustrate books and journals. Most were portraits, and appeared as book frontispieces, or supplements to periodicals such as *Galerie contemporaine* (1876–84) and *The Theatre* (1878–97), but additional applications included landscapes and architecture (*Treasure Spots of the World,* edited by Walter B. Woodbury, 1875; William de Wivleslie Abney**'s** *Thebes and its Five Greater Temples*, 1876), social documentary (John Thomson**'s** *Street Life in London,* 1877–78) as well as reproductions of works of art (*Tresor Artistique de la France,* 1877, contains some very large woodburytypes as well as examples of Léon Vidal**'s** related photochromie process). However in 1890s, woodburytype seems to have been increasingly displaced in the high quality sector of the market by collotype and photogravure, both of which offered the advantage of being able to be directly printed onto plate paper suitable for binding into books.

Woodburygravure (so named because the matte-surfaced results resembled photogravure, although on close inspection the image appears slightly raised, especially in the darker areas) was a transfer process introduced in 1891. After printing on a temporary support given a special waxy coating to facilitate release, prints were trimmed, transferred to their final support, and the backing sheet peeled away after the application of a solvent. These extra steps were, however, expensive: Henry W. Cave's *The Ruined Cities of Ceylon*, first published in woodburygravure in 1897, cost 38 shillings, but a slightly smaller 1900 reissue in collotype cost only 12 shillings.

Other processes derived from woodburytype include Woodbury's photo-filigrane, which used a woodburytype relief to impress images resembling watermarks in already manufactured paper; Woodbury's photolithophane, which used a woodburytype relief to cast photographic intaglio transparencies in translucent porcelain; and Henri Rousselon's Goupil gravure, which used some form of granulation in a woodburytype relief

to create the grain for conventional intaglio printing. However photo-filigrane and photo-lithophane remained mere novelties (although Leon Warnerke apparently adapted photo-filigrane to forge Russian banknotes), and Goupil gravure, while producing beautiful velvet blacks, ultimately proved too costly even for the high end of the art market.

Around 1900 two German inventors, Paul Charles and Stephan Faujat, attempted to revitalize woodburytype by automating the process (they also produced a few reportedly remarkable three-color prints), but it was too late. Despite its delicacy and beauty, woodburytype remained a transitional technology for publishing photographs, a labour-intensive means of mass-producing reproductions of carbon prints that partially replaced the pasted-in albumen silver photograph, but was itself replaced by faster, cheaper, type-compatible processes like the half-tone.

PHILIP JACKSON

See also: Carbon Print; Woodbury, Walter Bentley; Swan, Sir Joseph Wilson; Albumen Print; Carbutt, John; Stereoscopy; Cartes-de-Visite; Cabinet Cards; *British Journal Photographic Almanac;* Braun, Adolphe; Bruckmann Verlag, Friedrich; Goupil & Cie; Lemercier, Lerebours & Bareswill; *Galerie Contemporaine (1876–1884)*; Landscape; Architecture; Abney, William de Wiveleslie; Documentary; Thomson, John; Vidal, Léon; Collotype; Photogravure; Warnerke, Leon; and Half-tone Printing.

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WORTHINGTON, ARTHUR MASON (1852–1916)

Physicist and scientific photographer

Born 11 June 1852, Arthur Worthington, FRS, became Professor of Physics and then Head Master of the Royal Naval Engineering College, Devonport. Having published papers in 1877 and 1882 on the physics of surface tension, especially the stretching of liquids, Worthington introduced photography into his experimentation in 1894, following in the footsteps of the stroboscopic work of C. V. Boys and Ernst and Ludwig Mach. Worthington and his assistant R. S. Cole established a method for taking individual frames of drops illuminated with a Leyden-jar spark, which they executed and exhibited at the Royal Institution in May 1894. Having decided that photography was a more practical method for the study of surface tension, Worthington conducted the full range of his experiments again, this time documenting each one photographically, one frame at a time. He was the first to make the experiment of the falling milk drop, which has since become the visual icon of fluid dynamics. Although Worthington's early work was more a comparison of one sort of drop to another, he carried on to track all phases of a single drop. In 1908, Worthington published his book, *A Study of Splashes*, which was used extensively by D'Arcy Wentworth Thompson in his extraordinarily influential *On Growth and Form* (1917). Arthur Worthington died 5 December 1916.

KELLEY WILDER

WOTHLY, JACOB (active 1850s–1860s)

Jacob Wothly's name is associated with a short-lived attempt to introduce a printing process based on uranium in addition to silver, as a method of overcoming the recognised impermanence of albumen paper. In the event, the Wothlytype, patented in 1864, proved to suffer from the same problems of fading, and fell out of use. One of the first to publish criticism of the process, William Henry Fox Talbot, shared photography's disappointment that the prints were not more permanent. The printing-out-paper was coated with a mixture of uranium ammonio-nitrate and silver nitrate in collodion, but was superseded by collodio-chloride papers before the end of the 1860s.

Wothly, originally a portrait photographer producing ambrotypes, with a studio in Theaterplatz in Aachen, appears to have been in business before 1853.

By the late 1850s, working with collodion negatives, he had developed an interest in making enlargements, and designed a significant improvement to Woodward's Solar Enlarger, simplifying the means of keeping the reflected light focussed on the back of

the equipment. He presented his ideas to the Societé Française de Photographie in early November 1860, and within a week *La Lumière* reported that he had sold his design to A. A. E. Disdéri for a reported 20,000 francs.

John Hannavy

WRATTEN, FREDERICK CHARLES LUTHER (1840–1926)

Very little is known about the life of Frederick Charles Luther Wratten, except that he initially embarked on a career as a school teacher, yet his legacy to the development of the modern photographic process was significant, and his name lives on in the industry eighty years after his death.

Wratten started his photographic career in 1861, aged twenty-one, as a clerk in Joseph Solomon's Photographic & Optical Warehouse in London's Red Lion Square, and by the mid 1870s, he had become convinced that the future of dry plates lay not with collodion but gelatin. In 1877 he established the company Wratten & Wainwright based in Great Queen Street, London, in partnership with Henry Wainwright. In their first year they marketed their own brand of collodion dry plates and in early 1878 they marketed their first gelatin dry plates—*London Ordinary Gelatin Dry Plates*—which were fifteen times as fast as their collodion equivalents. Four British companies pioneered the manufacture of gelatine dry plates, all launching products in that same year—Mawson & Swan in Newcastle (who had pioneered the process in 1877), The Liverpool Dry Plate and Photographic Printing Company, Samuel Fry & Co. of Kingston-on-Thames, and Wratten & Wainwright. In these early stages of mass-production, emulsion manufacture was beset by many problems, not least of which was batch-to-batch consistency.

Wratten's pioneering innovation in the preparation of the gelatine silver bromide emulsion sought to tackle those variations. Early attempts at manufacturing dry plate emulsions had failed to recognise the problems of effectively washing the emulsion to rid it of the excess bromides and other chemical impurities. Wratten introduced the idea of 'noodling' as an aid to cleansing the emulsion. By chilling and setting the gelatine silver bromide mixture, shredding the resulting jelly and then washing the shredded 'noodles'—resetting and re-noodling as required—Wratten's emulsions were thus washed much more effectively, resulting in their plates exhibiting enhanced purity and enhanced consistency from batch to batch. This in turn gave greater consistency in emulsion speed and therefore in exposure reliability.

Their plates were aggressively marketed throughout Europe, and Eder (1932) identified them as the first gelatine dry plates to be marketed in Austria. And yet, it was still a 'kitchen sink' business. According to Mees (1961), Mrs Wratten made the emulsion in her kitchen, and the emulsion was hand poured on to the plates. A batch of emulsion filled twenty teapots, and the pouring was done through the narrow teapot spout.

Wratten & Wainwright later advertised their 'London' brand dry plates as the oldest-established brand in the world, and their retail premises sold a wide range of photographic materials and accessories. By 1879 they had introduced their *London Instantaneous Plates*, with a sensitivity over forty times as great as collodion.

In the mid 1880s, Wratten 'Slow,' 'Ordinary' and 'Instantaneous' plates were amongst the first commercial brands to be subjected to rigorous testing by Hurter & Driffield. Driffield used Wratten Slow plates as the standard when testing the effectiveness of a range of developers, surely a tribute to their consistency.

From 1887 Wratten & Wainwright also marketed a range of own-branded cameras, and although there is no conclusive evidence that they manufactured the cameras themselves, they did advertise themselves as 'apparatus makers' in the London Post Office Directories between 1887 and 1894. Channing and Dunn (1995) list Wratten & Wainwright cameras as early as 1879—when they advertised their *New Double Camera* 'for instantaneous work' and four other designs between 1886 and 1895. Some researchers have suggested that the cameras may have been made for them by other London makers, including, perhaps, William Morley of Islington.

By 1896, their 'Photographic Depot' advertised that it supplied plates and chemicals, and photographic accessories. No mention is made of the 'Photographic Apparatus Department' which had figured in early listings.

A move to Croydon in 1890, to a factory in three converted houses in Canterbury Road, put emulsion manufacture and coating on to a proper commercial footing, with a coating machine made for them by Smith of Zurich. The company continued to develop improved emulsions and, in 1906, became the first company in Britain to manufacture and market panchromatic plates, incorporating the work on dye sensitisation which had been done by other researchers. The dye sensitisers used in their early pan plates were produced for them by Höhst in Germany.

At that time a young chemist had recently been appointed to the position of Joint Managing Director of Wratten & Wainwright Ltd, who by that time had expanded their manufacturing facility at Canterbury Road in Croydon. Dr. C. E. Kenneth Mees (1882–1860) had joined the company as a researcher, and within a few months had developed their first panchromatic plate. Attempts by earlier companies at dye sensitisation had involved bathing the coated plate in the sensitisers. Mees

was the first to propose sensitising the emulsion before coating, producing a much more reliable result.

Wratten's name, however, lives on in the working lives of present-day photographers in the classification code which he and Mees developed for the range of camera and safelight filters which Wratten & Wainwright introduced before 1909.

The rationale behind the numbering of his filter system seems somewhat arbitrary, but does have a basic structure to it. He started with low numbers applied to yellow filters, higher numbers for oranges, red and magentas, and higher yet for greens and blues. Numbered between 80 and 85, he listed filters which adjusted the colour temperature of the light reaching the film, with a range of miscellaneous filters occupying the range from 87 upwards. Of course, with the introduction of colour films, the Wratten filter list has been updated and expanded but, almost a century after their introduction, Wratten numbers are still the most commonly used to denote a filter's colour and character.

Wratten & Wainwright's plates so interested George Eastman that he visited Croydon to see the company's facilities in 1912, and was so impressed by Mees that he offered him a post in New York. The company was bought out by Eastman Kodak later that year—one of the specified conditions upon which Mees would agree to work for Kodak's new research department—and the workforce, including Wratten, transferred to the staff of Kodak Ltd. Mees ultimately became Kodak's Director of Research.

Frederick Wratten died in London on April 8, 1926 at the age of 86.

JOHN HANNAVY

See also: Eder, Joseph Maria; Fry, Samuel; Mawson & Co; Swan, Sir Joseph Wilson; Dry Plate Negatives: Gelatine; and Dry Plate Negatives.

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WYNFIELD, DAVID WILKIE (1837–1887)

British painter and photographer

David Wilkie Wynfield was born in 1837 in India, the son of Captain James Stainback Winfield of the 47th Bengal Native Infantry, and Sophia Mary Borroughes. The family returned to England in the early 1840s, upon Captain Winfield's retirement. Wynfield's mother was the niece and adopted daughter of acclaimed Scottish painter of genre scenes Sir David Wilkie. Yet the young Wynfield did not immediately follow in the footsteps of his namesake (and godfather), initially intending to enter the priesthood.

In 1856, Wynfield decided to study art with historical painter James Mathews Leigh. Leigh's studio fostered the St. John's Wood Clique, a group of young artists—Philip Hermogenes Calderon, J. E. Hodgson, G. D. Leslie, Henry Stacy Marks, Val Prinsep, George A. Storey, Fred Walker, William Frederick Yeames, and Wynfield—who would meet weekly at each other's homes to sketch a set theme and critique the results. These men, many of whom had taken an initial study tour of Europe, had gravitated to London in the mid-1850s, where they formed a uniquely British, gentlemanly version of bohemia in which like-minded coteries of painters, illustrators, and writers dedicated themselves to establishing a "British School." Following Leigh's teaching, Wynfield adopted historical subject matter and highly illusionistic rendering. He first showed at the Royal Academy in 1859 and appeared regularly thereafter, gaining a modest reputation and a steady income as a specialist in subjects from English history, though never achieving the rank of Academician. He changed the spelling of his surname around 1860, probably to avoid confusion with the slightly older painter of historical genre scenes J. D. Wingfield.

A social group above all, the St. John's Wood Clique dabbled in amateur theatricals; they also participated together in the 38th Middlesex Corps of the Artists' Volunteer Rifles, one of many such companies that sprung up in the spring of 1860 in response to Napoleon III's expansionist policies. Most participants abandoned the Corps after a brief period, but for Wynfield (who never married) the comradeship was clearly important, for he remained in the Corps into the 1880s, rising to the rank of captain. It is not known exactly when or why Wynfield took up photography, but his friendship with Frederick Richard Pickersgill—painter, amateur photographer, and son-in-law of Roger Fenton—may have been influential.

Wynfield's most significant photographic project, begun around 1861, was a series of portraits of artists—not only painters, but also architects and graphic artists—in Tudor and Renaissance costume. He registered ten of these for copyright on 8 December 1863 and exhibited a selection at a meeting of the Graphic Society in mid-January 1864. Henry Hering of Regent Street published a series of the portraits under the title *The Studio: A Collection of Photographic Portraits of*

Wynfield, David Wilkie. George Grederick Watts. *The Metropolitan Museum of Art, Warner Communications Inc. Purchase Fund, 1977 (1977.537) Image © The Metropolitan Museum of Art.*

Living Artists, Taken in the Style of the Old Masters, by An Amateur in the late spring of 1864; each issue sold for a guinea and included four photographs in the style of a continental school. *The Studio* attracted little notice in the photographic press, and two positive notices in more general periodicals, *The Reader* and the *Illustrated London News*, seem to have been insufficient to encourage future publication and indeed Wynfield withdrew the images from circulation about six months after their initial exhibition.

Wynfield's photographic portraits comprise a consistent body of work. All are albumen prints from wet-collodion negatives on 8 × 6-inch plates, and all except one are busts of male sitters (the exception is a head study of his sister Annie Yeames). The sitters occupy very shallow spaces, before backgrounds that function mainly as patterns of light and dark, setting off corresponding features in the heads or clothing. Most of the costumes refer to the fifteenth, sixteenth, or seventeenth centuries, and often bear some connection to the subject: for example Marks, painter of many Shakespearean subjects, appears in Elizabethan costume. Wynfield made many visual references to Holbein and Van Dyck, but did not re-create specific works and frequently combined elements from various styles and periods in a single image. Most sitters were Wynfield's contemporaries and friends, many of whom had yet to make their reputations at the time they were photographed. Associating his fellow artists with the Old Masters, Wynfield projected their shared desire to be seen as humanists who could bridge past and present, soul and intellect, commerce and nobility, fame and its renunciation. He also expressed, much more clearly than in his paintings, the notions of breadth and idealism then attached to the Old Masters—qualities that stood in direct opposition to the focus, detail, and specificity that characterized most genre paintings and all commercial photographic portraiture. As seen from the perspective of a generalist art critic of the 1860s, David Octavius Hill was photography's Old Master, and Wynfield a worthy heir. The Photographic Society of London, meanwhile, was inhospitable to a practice they saw as insufficiently advanced technically and therefore unworthy of institutionalization. Wynfield never became a regular participant in the Society's annual exhibitions.

The relationship between Wynfield's painted and photographic production is far from straightforward. In appearance and construction they are totally different—and indeed Wynfield must have been concerned to avoid the charge that he relied on photographs when composing his paintings—but both were motivated by a vision of the literary and historical past. Assessment of Wynfield's achievement has been compromised by association with Julia Margaret Cameron, who approached him as a pupil in 1864 and later declared that "to his beautiful photography I owe all my attempts and indeed consequently all my successes." There is no doubt that Wynfield's photographs exhibit, in fact pioneered, many of the qualities now associated with Cameron's work, such as close-up format, soft focus, impressionistic atmosphere, and strong chiaroscuro. Historians—following the lead of nineteenth-century commentators—have applied the label of "amateur" positively to Cameron, using it to imply freedom from convention; with regard to Wynfield the term seems pejoratively to connote dilettantism, frivolity, and technical ineptitude.

Wynfield's abandonment of photography is as undocumented as his embrace of it. It is not known if he continued to make photographs into the 1870s and 1880s. He died of tuberculosis in 1887, at age forty-nine. Examples of his portraits are found at the Royal Academy of Arts (given by his fellow artist and brother-in-law W. F. Yeames), the National Portrait Gallery, and the Victoria and Albert Museum.

BRITT SALVESEN

Biography

David Wilkie Wynfield was born in India in 1837, the namesake of his mother's uncle and adoptive father, the

renowned Scottish painter David Wilkie. After considering the priesthood, Wynfield decided to become an artist and entered the studio of James Mathews Leigh. There he learned to practice a style of historical genre painting and met the young artists with whom he would form the St. John's Wood Clique. Wynfield exhibited at the Royal Academy for the first time in 1859, and continued to do so regularly thereafter. Taking up photography around 1860, he produced a number of soft-focus, bust-length portraits of artists from wet-collodion negatives on albumen paper, some of which were published in 1864 under the title *The Studio*. Although Julia Margaret Cameron credited Wynfield as her major influence, he received little acclaim in Photographic Society circles. It is not known if he continued to make photographs into the 1870s and 1880s. Wynfield died of tuberculosis in 1887.

See also: Art photography; Historiography of nineteenth-century photography; Impressionistic photography; Portraiture; Hering, Henry & Co.; *Illustrated London News;* Wet Collodion Negative; and Photographic Exchange Club and Photographic Society Club, London.

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X

X-RAY PHOTOGRAPHY

X-ray photography was one of the most important discoveries of the 19th century. Developed in November 1895 by German scientist Willhelm Conrad Röntgen (1845–1923), the x-ray thus straddles the cusp between two centuries. The phenomenon captured the public's imagination to an extent not experienced; its fascination was not to be eclipsed until the hydrogen bomb in 1945. The aesthetic and theoretical ramifications of x-rays also proved fertile ground for artists seeking new ways to picture inner realities. Röntgen won the first Nobel Prize in Physics in 1901 for his breakthrough, yet declined to seek a patent and remained modest about his remarkable discovery for the rest of his life. Interestingly, Röntgen disliked being photographed, therefore few images of him exist.

Röntgen, like many other researchers of his time, was interested in the nature of cathode rays. To accomplish his light experiments, he used vacuum glass tubes, commonly known as Crookes tubes after William Crookes, a British scientist who perfected them in the 1870s. Working in the Physical Institute laboratories of the University of Wurzburg, Röntgen studied emissions produced from an electrical current passed between the cathode (negative) and anode (positive) terminals. The cathode rays normally caused the walls of tube or other internal objects to glow, but did not seem to be able to penetrate the glass. Röntgen was astonished when his cardboard shrouded tube caused a barium platinocyanide screen across the room to fluoresce. Placing various objects between the tube and screen, he saw the bones of his hand through his flesh, which he subsequently captured on a photographic plate. What followed was seven straight weeks of intense experimentation. He remarked to a friend, "I have discovered something interesting, but I do not know whether or not my observations are correct."

On December 28 1895, Röntgen gave a preliminary report to the Physical-Medical society of Wurzburg, and by New Year's Day he sent copies of his report to colleagues across Europe. Newspapers and magazine quickly picked up the story and by January, the whole world was caught up in x-ray fever. Other non-existent rays were posited—including N-rays, black rays, and Becquerel Rays (later found to be the alpha, beta, and gamma rays produced by radioactive materials). Every imaginable substance, including animals and objects, were exposed. Eager for news of each new photographed organ, cartoonists and poets lauded the humorous new possibilities of seeing people's thoughts and peering through underwear. By 1896, over 60 articles had been featured in the popular press as well as the first angiography, cinematic x-ray, and military radiology performed.

The first generally-accepted x-ray photograph is that of Mrs. Röntgen's ringed hand from December 22, 1895. (After learning of the discovery, A.W. Goodspeed and William Jennings recreated one they had made by accident in 1890.) X-rays were seen as extension of the photographer's craft and were included in many manuals and journals. After Thomas Edison's invention of the fluoroscope in 1896 (a kind of hooded camera fitted with a screen), many x-rays were performed as demonstrations. People lined up at department stores, high schools, and other public venues to get "bone portraits." Dubbed "shadow photographs," X-rays soon after needed no camera, a capacity shared with some of the earliest forms of photography, and no film. Still, the evidentiary nature of a photograph proved irresistible, especially to photographers, scientists, and the press. Eadweard Muybridge made stop action photographs and films of frog's legs in motion in 1896. Edison even claimed that the rays would eventually show the activity of the human brain.

As x-rays are radiation, they can both diagnose and cure. Enthusiasts, not having a precedent, exposed themselves regularly to test strength and perform demonstrations. Reddening of the nose and hands of practitioners was common. The early decades of the 20th century saw the death of many early pioneers due to numerous amputations and burns resulting from overexposure. It was not until the death of Edison's assistant in 1904 that the spotless record of the rays began to wear thin. The novelty and pure aesthetics of the rays gave way to medical applications—both legitimate and illegitimate. Medical schools added x-rays to their curricula; likewise, correspondence courses offered programs for photographers and electricians to gain training in "Röntgenology." "Do-it-yourself" kits were even sold in popular magazines.

Röntgen initially described x-rays as "longitudinal vibrations in the ether". The ether was a commonly held scientific hypothesis that a mysterious substance occupied the air and was the media through which waves and a whole host of other as yet inexplicable phenomena moved. At the turn of the last century, science and occultism occupied a much closer range than they do today and x-rays were thought by many to give credence to extra-sensory perception and psychic ability. If such non-perceptible spectacles could be captured on a photographic plate, it was argued, so too could thoughts, auras, ghosts, and even the human soul. Philosophically, the discovery of x-rays caused a scientific sea change. No longer did the senses seem an adequate platform for analysis; scientific positivism was at a standstill. Furthermore, these rays could also kill as well as cure, presenting a medical and moral conundrum.

It was not until the 20th century that x-rays were confirmed to be a part of the electromagnetic spectrum. Röntgen had covered his tube to keep the fluorescent effects contained; yet he found that the new rays could not be reflected, polarized, or refracted. It was later proved that x-rays have shorter wavelengths than visible light (around one billionth of a meter) and are related to radioactivity (discovered in 1896 and later studied by Marie and Pierre Curie). A trained glass blower, C.H.F. Muller was the first to construct commercially viable x-ray tubes and was later granted a patent in 1899. His firm expanded until another company took over in 1927, eventually setting the foundation for the new and improved x-ray apparatus we know today.

LESLIE K. BROWN

See also: Edison, Thomas Alva; Scientific Photography; and Photogrammetry.

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Y

YEARBOOK OF PHOTOGRAPHY

The *Yearbook of Photography* was published by the weekly periodical *Photographic News* and was usually edited by that publication's editor. It was for many years the alternative to the *British Journal of Photography's Photographic Almanac* (1859–1963) but never quite grew in the same way or gained the same following. By 1894 the *Almanac* numbered 1336 pages against the *Yearbook's* 612 pages. It remains important as there were advertisers who only took space with one publication and the editorial content provides a useful alternative to the *Almanac*.

The *Yearbook* first appeared as the *Photographic News Almanac,* known as *Almanack* in 1859, *or the Year Book of Photography* in 1859 a title that it kept until 1863. The 1859 *Almanack* was published on 10 December 1858 at a cost of 6d and described in the *Photographic News* of 17 December 1858 (177). The intention is to 'disseminate useful and important information, alike to the practised operator and amateur… It will be found to be of the greatest assistance not only to the private amateur, but also to the professional photographer; to the former, on account of the numerous hints it contains, which if attended to, will ensure success under the most unfavourable circumstances; and to the latter, for the information on subjects which are so liable to escape memory.'

It became the *Yearbook of Photography and Photographic News Almanac* in 1864 and last appeared with the 1907/08 edition after which it's parent, the *Photographic News*, was absorbed by *Amateur Photographer*.

The original *Almanack* absorbed William Lay's *Photographic Almanac and Ready Reckoner for the Year of Our Lord 1859* which appeared for one year only. It was incorporated into the second volume of the *Photographic News Almanac* for 1860. Lay's *Almanac* and the first issue of the *Photographic News Almanac* lay claim as the world's earliest photographic almanacs.

The first editor was G. Wharton Simpson (1825–1880) who remained in that position until the 1880 edition; H. Baden Pritchard (1841–1884) edited the years 1881–1884; Thomas Bolas (1848–1932) edited 1885–1889; T. C. Hepworth (died 1905) edited 1892–1893; E. J. Wall (died 1928) edited 1897-1898; Percy R. Salmon (died 1959) edited 1901–1905 and F. J. Mortimer (1874–1944) edited 1906–1908. The missing years were not credited.

The content of the *Yearbook* was remarkably constant over its history from the 1859 *Photographic Almanac*. The editorial pages usually began with a calendar for the year and astronomical information, followed by a list of the principal photographic societies and their officers for Great Britain. A review of advances within photography for the previous year provided a useful survey of new processes, apparatus and survey of the profession as well as the principal deaths for the year. This was followed by an extensive list of photographic processes and formulae. A number of essays by noted amateur and professional photographers on practical aspects of photography completed the book. In, for example, the 1866 volume the essays included J. H. Dallmeyer on lenses, Jabez Hughes on constructing a photographic darkroom, Rejlander reflecting on photography and art, Thomas Richard Williams on portraiture and Henry Peach Robinson on managing sitters amongst others. All volumes contained substantial advertisement sections. In later volumes the amount of formulaic information was reduced to make way for surveys of new equipment and a trade directory. The essays during the 1880s and 1890s began to become more technical in nature reflecting the editors' own interests and the general editorial slant of the *Photographic News*.

MICHAEL PRITCHARD

See also: *British Journal of Photography*; *British Journal Photographic Almanac (1859–);* Bolas, Thomas; Dallmeyer, John Henry & Thomas Ross; Rejlander, Oscar Gustav; Williams, Thomas Richard; Robinson, Henry Peach; and *Photographic News (1858–1908).*

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YOKOYAMA MATSUSABURO (1838–1884)

Japanese painter, photographer

The Japanese photographer Yokoyama Matsusaburo was born in Etorofu Island (now disputed territory with Russia), but spent his childhood in the port city of Hakodate. His lifelong love was painting, but when Commodore Perry's ships visited Hakodate in 1854, Yokoyama was intrigued by the photography of Eliphalet Brown. This interest was reinforced when, later that year, the Russian photographer Aleksandr Mozhaiskii took daguerreotypes of the streets of Hakodate. Thinking that mastery of photography would help him to become a better artist, he traveled to Yokohama and studied under Shimooka Renjo. Returning to Hakodate his technique was further refined by the Russian consul and amateur photographer, Iosif Goshkevich. In 1868, Yokoyama opened his own lavish studio in Tokyo. In 1871 he famously photographed the partially destroyed Edo Castle, and in 1873 Japanese art works destined for the Vienna Exposition. In the same year he began to concentrate on teaching art and photography students at his studio. In 1876 he gave up his studio and taught photography and photolithography at the Japan Military Academy until 1881. There he experimented with printing techniques and developed a form of photographic oil painting, shashin abura-e. In 1882 he contracted tuberculosis and spent the last two years of his life painting (particularly photographic oil painting) and immersing himself in a photolithography company which he founded. [Examples of Yokoyama's work can be found in the Tokyo Metropolitan Museum of Photography, Tokyo.]

TERRY BENNETT

YORK, FREDERICK (1823–1903)

Lantern slide manufacturer

York was born at Bridgwater, Somerset, England, in 1823. At 16 he was apprenticed to a Bristol pharmacist, where he came into contact with the new art of photography. He established and ran a photographic business in South Africa, 1853–1861. Returning to England, in 1863 he set up a stereoview and lantern slide business at 87 (later at 67) Lancaster Road, Notting Hill, London. The firm soon concentrated on photographic slides, and son William joined the business in 1877. York & Son's slides, by the 1890s over 100,000 per year, were manufactured in Bridgwater. Subjects included Travel, Comic, Science, Education, and Life Models. Travel scenes were produced with negatives 'bought-in' from other photographers. Life Model sets were photographed by the York company, whose only serious competition in this genre was Bamforth & Co. Costumed 'actors' posed in front of painted backdrops or, occasionally, exterior scenes to create a series of tableaux. Many scenes were photographed in a garden studio at Lancaster Road. Themes included temperance, popular songs, services of song, and 'tearjerker' stories. After Frederick York's death in 1903 William carried on, but the firm was dissolved in 1907. Newton & Co used the York name until the late 1940s.

STEPHEN HERBERT

YOUNG, THOMAS (1773–1829)

English physician and natural philosopher

Thomas Young is chiefly acknowledged for providing the decisive arguments against Newton's particle theory of light, leading eventually to widespread acceptance of the wave or undulatory theory. He also developed theories of interference and three-color composition of light which were important for the development of colour photography. Born 13 June 1773 to a Quaker family in Somerset, Young exhibited a prodigious intellect, studying literature, ancient and modern languages, engineering, chemistry, optics, mathematics and medicine. Having studied at both Edinburgh University and at the University of Göttingen, he became widely read in a number of Continental philosophers, including Leonhard Euler. Euler proposed that colors were created by the frequency of vibration in the ether, the longest wavelength corresponding to the red end of the spectrum. Young adapted his own analogies of light and sound to form a defence of a general wave theory of light in 1801. In his publication of 1804, *Experiments and Calculations Relative to Physical Optics*, Young published proof of the extension of the spectrum into the 'invisible' region beyond the violet. Like many investigators of light he employed the well-known sensitivity of silver nitrate, casting the image from a solar microscope on strips of paper soaked in the solution. Thomas Young died 10 May 1829 in London.

KELLEY WILDER

Z

ZANGAKI BROTHERS (active 1870s–1900s)

The Zangaki brothers produced some of the finest images of late Victorian Egypt, yet so little is known about them. They were probably Greek Cypriots, although it has been suggested they may have come from Crete. Nothing is known of them before their first photographs were published in Egypt in the late 1870s, and even the names of the brothers themselves is unknown. It has been suggested their initials were 'C' and 'G,' and indeed early 20th century photographic postcards bearing the name 'C Zangaki' have been located.

Their photographs, however, were simply identified as 'Zangaki,' the letter 'Z' being frequently mistaken for a stylised 'L' in several books, resulting in their work being incorrectly ascribed to 'Langaki.' Indeed, until relatively recently, there was assumed to be one photographer with the name of 'A Zangaki' until the discovery of a signboard bearing the legend 'Adelphoi Zangaki' confirmed that the images were the work of brothers.

While their Greek—Cypriot or Cretan—roots are confirmed, the horse-drawn darkroom van with which they toured the length of the Nile bore the legend 'Zangaki Brothers,' and to further confuse matters, the majority of their images are titled (in the negatives) in French.

Amongst many fine images are photographs taken after the bombardment of Alexandria in 1882, and some eloquent commentaries on the popularity of the Grand Tour of Egypt in the 1880s.

JOHN HANNAVY

ZEISS, CARL (1816–1888)

The name of Carl Zeiss is synonymous with quality photographic optics, and has been for well more than a century and a half. Throughout the twentieth century, cameras fitted with Zeiss optics were used by the major figures in photography. But during Carl Zeiss's lifetime, the company made its name through the design and manufacture of the highest quality microscopes.

However, it is to Zeiss and his associates that we owe the emergence of the science of optical design and manufacture—a science which had a direct and enduring impact on the development of photographic lenses.

Carl Zeiss himself was born in Weimar on 11 September 1816, and apprenticed to Dr Friedrich Körner, a microscope and scientific instrument maker, before opening his own workshop in 1846, repairing optical and scientific equipment. After Körner's death in 1847, Zeiss took over some of his former employer's business interests, developing the first 'compound microscope' in that same year. It is recorded that in his first year of operation, he sold twenty-three microscopes! Twenty years later he sold his one thousandth, and a further twenty years later, 1886, saw the ten thousandth microscope sold!

1866 was a key year for Zeiss and marked the beginning of his working relationship with Dr. Ernst Abbe, then a physics lecturer at the University of Jena. With Abbe, Zeiss would become a major player in lens manufacture, and the Zeiss Optical Works, established in that same year, soon had Abbe as its Director of Research. The marriage of Zeiss's manufacturing experience, and Abbe's scientific understanding proved pivotal. Between them, the two men would develop the design and manufacture of high quality lenses into a precise science where, as Abbe noted, lens design was based on

> *'a precise study of the materials used,* [and] *the designs concerned are specified by computation to the last detail—every curvature, every thickness, every aperture of a lens—so that any trial and error approach is excluded.'*

Within six years the company had developed a significant number of new microscope lenses, all based on Abbe's

theoretical research and mathematical modelling. They combined high quality, large apertures, colour accuracy and minimal distortion—all essential characteristics in a microscope lens.

In 1881, Abbe met Dr. Friedrich Otto Schott, who had achieved his doctorate in glass science a few years earlier. Combining Abbe's scientific approach with Schott's researches into the manufacture of high quality mineral-rich glasses—using phosphorus, lithium and boron—paved the way for the development a whole new generation of lenses, including the first apochromatic (or fully colour-corrected) lenses, eliminating chromatic aberration, the bane of microscope users. Before then, achromats had been corrected for only two of the three primary colours.

Schott and Associates Glass Technology Laboratory, a partnership between Zeiss and Schott, was formed in 1884. With Abbe's scientific approach applied to the manufacture of glasses, and the introduction of new and precisely computed ingredients, over a hundred new types of glass were developed. Zeiss lenses by the 1880s were recognised the world over for their optical purity and accuracy.

Carl Zeiss died in 1888 and control of the Zeiss Optical Works passed to Abbe, who had been a partner since the mid 1870s. In the following year Abbe transferred ownership of the company to the Carl Zeiss Foundation, together with their interests in Schott's glassworks. The purpose of the foundation was to fund research, and also to initiate social and workplace reforms. It is reported that by 1900, Zeiss workers enjoyed profit-sharing, an eight hour working day, paid annual holidays, a basic health-care plan, and retirement pension. A century ago such benefits was revolutionary.

The first years after Carl Zeiss's death saw the company develop a series of camera lenses which were to endure for a century and more. The Zeiss Planar (1896) and Tessar (1902) are perhaps the most long-lived lens designs in the history of photography.

JOHN HANNAVY

See also: Schott, Friedrich Otto, and Abbe, Ernst Karl.

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ZIEGLER, JULE (1804—1856)

Jule Ziegler was a celebrated painter of the July Monarchy, ceramist, and photographer. His contribution to photography is manifold. Of an inventive spirit, Jules Ziegler performed many experiments on techniques, optics, and color. From the early 1840s, he was devoted to the daguerreotype and improved its coloring. In 1851, he was one of the first in France to use wet collodion. The same year, he joined the management committee of the Société heliographique and he was awarded a certificate for his photography at the Great Exhibition at the Crystal Palace, London 1851. He wrote many articles for *La Lumière* and a report on photography for the Paris Exposition Universelle of 1855. Ziegler's work exhibited similarities with that of his friend Hippolyte Bayard, who did his portrait with the daguerreotype in 1844 (SFP), as well as with the topics of the compositions: still lifes, sculptures, reproductions of antiques (*Venus de Milo*), and views of his garden. He used photography to emphasize his work as ceramist; sandstone vases of his manufacture are reproduced in several negatives (girl in front of the Vase with the twelve apostles). The museum of Langres preserved a set of his photographs, including compositions with sculptures and vases and the Pallet of the painter.

HÉLÈNE BOCARD

ZILLE, HEINRICH (1858–1929)

Heinrich Zille was a draughtsman and famous Berlin engraver, author of albums, and collaborator of satirical newspapers. In about 1887, he started photography as a way to aid. He initially photographed his family, then chronicled the proletariat with a series of the women at the market, men returning home from work, children in the streets, and fairs. He also took portraits of artists in their workshops and he completed nude studies as well. By 1914, he took hundreds of negatives on glass plates of gelatine-bromide. Zille never published his photographs, which he regarded as working tools. Discovered in the 1960s, they were appreciated for their modernity: instantaneous with the characters captured in full action, sometimes seen from the back, walking. His images also had a persistent flat spaces, inscriptions, and lines that created dynamic effects (crossroads, scaffolding).

Through his unique artistic eye, Zille drew attention to the grounds, the palisades, and the walls thought to be common. His images of the poor district, Krögel were described as having direct vision, without an aesthetic research or anecdote. Dependent on the Berliner Secession, Zille always remained outside of any aesthetic contemporary category. If his work is connected with naturalism, it is only because he approached the expressionists by simplifying the human form to the point of making a prototype of it. The originality of his vision on certain topics (shops) was pointed out by Eugene Atget. These images in fact are documents of great value on the social dimension of Berlin in 1900.

HÉLÈNE BOCARD

ZOLA, EMILE (1840–1902)

"In my view you cannot claim to have seen something until you have photographed it." This is a rather curious sentiment, since it came from its author, Emile Zola, after most of his incredible writing career, which was largely based on good old-fashioned visits, conversations, and note-taking, was over. Zola was virtually a writing machine who became famous by turning out mostly great and in any case best-selling novels at the rate of more than one per year for more than 30 years. He wrote many of them for serialization, keeping just ahead of their journal publication, and then they were published as books. The biggest project was *Les Rougon-Macquart*, a more than 20 volume set of familial and social disasters that ran from 1871-93. He novelized the urbanization and modernization of France. He also wrote many journal articles, essays, criticism, and plays. A number of his books were successfully put on stage.

Zola became friends with Cezanne as a youth, with many of the Impressionists, and with Nadar (Felix Tournachon), Petit, Carjat, and other photographers in the 1860s. Nadar took many portraits of him between 1876 and 1898. Zola apparently took up photography on a particular trip in 1888, but did not start taking photographs seriously until 1894, and took perhaps 5000 images up to his murder in 1902. He was passionate about photography in writing and in speaking. He collected about a dozen cameras, including large and small formats, stereo and panoramic equipment. He did his own darkroom work, from mixing his photochemistry to enlarging and printing. His subjects included portraits, mostly of his family, especially his paramour and their children; his wife; some friends, and then landscapes, railroad scenes, street scenes in Paris and London, and the Paris World's Fair of 1900. He considered himself a member of the naturalist (or realist) school in his writing, and that is reflected in his photographic compositions. One of his best photos of Paris, of Place Prosper-Goubaux on a rainy day, shows from its camera angle, mistiness, shadows, carriages, pedestrians and buildings strong similarity to Caillebotte's famous painting, *Rue de Paris, temps de pluie* (*Paris street in Rainy Weather*, 1877). It is extremely likely Zola had seen the painting and knew Caillebotte.

Zola also publicly and famously defended Capt. Alfred Dreyfus after he was unjustly and falsely accused of treason. In 1898 Zola wrote a front page open letter to the French President in the Paris newspaper *L'aurore,* under the banner "J'accuse...!" that ripped apart the Army's case. Zola was tried and convicted of slandering the Army, and fled to exile in England for 11 months, where he continued to photograph. Zola returned in 1899. Dreyfus was tried and convicted again, but almost immediately pardoned by the President and reinstated by the Army. In the 1920s a stove fitter confessed on his death bed to stuffing the chimney of Zola's country house one night. Carbon monoxide killed him in his sleep.

WILLIAM R. ALSCHULER

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